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## CONTENTS

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Sl. No.	Articles	Page No.
1.	<b>CONCEPT OF HYPOTHYROIDISM [QILLAT-E-IFRAZ-E-DARQIYA] IN UNANI SYSTEM OF MEDICINE</b> Tabassum S. M Iqbal, A.H. Farooqui, Shaikh Salma, Shoeb Pathan, Tausif S. Khan, Quaasim Ahmed Qureshi	83-86
2.	<b>BRIEF REVIEW OF QOOPA (DERMATOPHYTOSIS) &amp; ITS MANAGEMENT IN UNANI PERSPECTIVE</b> Shoeb Khan, Ayesha Fatema Syed, A.H. Farooqui, Jaleel Ahmed, Tabassum S.M. Iqbal and Quaasim Ahmed	87-92
3.	<b>EFFECT OF AN UNANI REGIMEN IN THE TREATMENT OF 'YARAQĀN' (JAUNDICE): A CASE REPORT</b> Athar Parvez Ansari, N Zaheer Ahmed, Noman Anwar, and Mohammed Farhan K.	93-101
4.	<b>MANAGEMENT OF FACIAL PALSYP (LAQWA) THROUGH UNANI MEDICINE: A CASE SERIES</b> Ifra Abdul Qaiyyum, Sameena Abdul Qaiyyum and Mohd Afsahul Kalam	102-107
5.	<b>STUDY TO EVALUATE THE EFFECT OF AABZAN OF WARM WATER IN CASES OF INSHEQAQ MAQADHAAD (ACUTE ANAL FISSURE)</b> Dr. Mohammad Shaad, Dr. Shaikh Ejaz Parvez and Dr. Manzoor Ahmed	108-111
6.	<b>CLOVE/QURANFUL (SYZYGIUM AROMATICUM L.): A REVIEW ON ITS POTENTIAL BENEFITS IN UNANI MEDICINE, BIOACTIVITIES AND CURRENT SCIENTIFIC APPLICATIONS</b> Shabnam Anjum Ara, Shaheen Akhlaq, Merajul Haque, Mohammad Fazil, Usama Akram, Bilal Ahmad and Asim Ali Khan	112-120
7.	<b>DHĀK BUTEA MONOSPERMA-A REVIEW ON ETHNOBOTANICAL AND UNANI PROSPECT AS WELL AS PHYTOCHEMICAL AND PHARMACOLOGICAL PROPERTIES</b> Waseem Ahmad, Azma Waseem, Mohammad Fazil and Asim Ali Khan	121-131
8.	<b>THERAPEUTIC APPLICATION OF TANKAR (BORAX) ACCORDING TO UNANI SYSTEM OF MEDICINE: A REVIEW</b> Ifra Abdul Qaiyyum and Sameena Abdul Qaiyyum	132-137

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9. **USE OF UNANI MEDICINE AS A POTENT ALTERNATIVE IN ORAL HEALTH PROMOTION: A NARRATIVE REVIEW** 138-146  
Shaheen Akhlaq, Shabnam Anjum Ara, Mohammad Fazil, Bilal Ahmad, Usama Akram, Merajul Haque, Ahmad Sayeed, and Asim Ali Khan
10. **PIVOTAL ROLE OF HABB-I-GUL-I-AAKH IN THE MANAGEMENT OF WAJA 'AL ZAHR (LOW BACK PAIN): A REVIEW** 147-154  
Arshi Aqeel, Mohammed Sheeraz Mushtaque Ahmed and Mohd Naved
11. **EFFICACY OF A UNANI REGIMEN IN THE TREATMENT OF FALIJ-E-NISFI (HEMIPLEGIA): CASE SERIES** 155-160  
Ifra Abdul Qaiyyum, Mohammad Zubair, Shaikh Imtiyaz and Shaheda Rahmani
12. **ROLE OF ILAJ BIL GHIZA (DIET THERAPY) IN PREVENTION OF LIFE STYLE DISORDERS** 161-165  
Sadaf T.A. Shaikh and Mohd. Anwar

## CONCEPT OF HYPOTHYROIDISM [QILLAT-E-IFRAZ-E-DARQIYA] IN UNANI SYSTEM OF MEDICINE

Tabassum S. M Iqbal, A.H. Farooqui, Shaikh Salma, Shoeb Pathan  
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### Review Paper

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### ABSTRACT

As the cases of hypothyroidism is increasing in India, one woman after other women getting affected, it is very essential to know more about this condition and prevalence, early detection of this condition and early management of the disease resulting in good recovery. Population growths, rapid urbanization, are playing a major role in disease spread. Measures should be taken to control the aforementioned causes to prevent disease spread and Hypothyroidism (*Qillat-e-ifraz-darqiya*) is a clinical state resulting due to structural and functional abnormalities of thyroid gland caused by thyroid hormone deficiency by reduced production. In simplest term it can be defined as deficient production of thyroid hormone. It's caused mainly in women and less number in men.

No. of Pages: 4

References: 28

**Keywords:** Qillat-e-ifraz-darqiya, Hypothyroidism, Thyroid stimulating hormone, Evidence-based Unani medicine.

### INTRODUCTION

Thyroid gland is a butterfly-shaped endocrine gland that is normally located in the lower front of the neck. The thyroid's job is to make thyroid hormones, which are secreted into the blood and then carried to every tissue in the body. Thyroid hormone helps the body use energy, stay warm and keep the brain, heart, muscles, and other organs working as they should the disease of thyroid chiefly effects the females and are common in them. Occurring in about 5% of the population. The word hypothyroidism is derived from Greek word hypo-'reduced', thyreos 'shield', and eidos 'form'.<sup>(1,2)</sup>

The concept is based on Hypothyroidism (*Qillat-e- Ifraz-e-Darqiyya*) affects women more frequently and its incidence increases with age. Worldwide about one billion people are estimated to be iodine-deficient; however, it is unknown how often this results in hypothyroidism The prevalence of hypothyroidism in is India about 11% whereas, in developed countries it is around 4-5%,. It is a condition where the thyroid gland is underactive and unable to produce enough thyroid hormone. In other words, Hypothyroidism (*Qillat-e- Ifraz-e- Darqiyya*) is the most common endocrine disease

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caused by a defect in the thyroid gland that leads to reduced production of thyroid hormone. It has multiple aetiologies and manifestations. Long-lasting effects of untreated hypothyroidism (Qillat-e- *Ifrac-e- Darqiyya*) or chronic hypothyroidism (Qillat-e- *Ifrac-e- Darqiyya Muzmin*) can lead to various co-morbidities, such as hypertension, anaemia, mixed hyperlipidaemia, hypercholesterolemia, obesity, diabetes mellitus, myopathy, weight gain, depression migraine and anxiety. One can say it can affect all systems of the body.<sup>(2,4,7)</sup>

### Concept of hypothyroidism in Unani Medicine:

There is no direct description of the Qillat-e-*ifraz-e-Darqiya* (hypothyroidism) in the Unani classical literature. Qillat-e-*Ifrac-e-Darqiya* is literal meaning of hypothyroidism. In fact the word myxedema, which is a characteristic feature of hypothyroidism, has been derived from the Greek word myxaoidema.<sup>(2,17,20)</sup>

- Ali Ibn Abbas Majoosi (10th century AD) stated that the waram which occurs due to Balgham-e- Ghaliz results in Ghaingha (goiter) which are similar to glands.<sup>(4,7)</sup>
- Buqarat (Hippocrates) (460-337 BC), in his book “De Glandulis”, narrated in context to the glands that “when glands of the neck become diseased themselves, they become tubercular and produce Struma”. The term “Struma” is still used in some European countries (e.g. Austria, Italy) under the caption of Goiter.<sup>(7,10)</sup>

### Pathophysiology

Su-e-Mizaj (Derangement in temperament) is derangement or imbalance of a temperament (Mizaj) of the body, whereas Su-e- Mizaj Baarid (abnormal cold temperament) indicates imbalance in the cold temperament. When an imbalance in the temperament of an organ develops and the signs indicate that it has a cold nature, it is called a cold temperament (Su-e- Mizaj Baarid); cold temperament can be indicated by various Alaamat (symptoms/signs), like excessive sleep, loss of appetite, increase of pallor in the body etc.<sup>(9,12,14)</sup>

### Causative Factors

#### ➤ Primary Atrophic Hypothyroidism<sup>(3,21)</sup>

1. Primary idiopathic hypothyroidism (probably end stage Hashimoto's disease) radiation to non-thyroidal malignancy.
2. Post-ablative (iatrogenic) or surgery or therapeutic radiation to non-thyroidal malignancy.

#### ➤ Goitrous Hypothyroidism<sup>(22,23)</sup>

1. Riedel's Struma.
2. Endemic Iodine Deficiency.
3. Iodine induced hypothyroidism.
4. Antithyroid agents.
5. Inherited defects of hormone synthesis.

#### ➤ Central Hypothyroidism<sup>(22)</sup>

1. Secondary hypothyroidism (Pituitary)
2. Pan hypopituitarism (Sheehan's syndrome, tumours, infiltrative disorders).
3. Isolated TSH deficiency.

#### ➤ Etiology According to Unani Concept<sup>(5,6,9)</sup>

The causes of Su-e-Mizaj Barid Balghami (deranged phlegmatic temperament) or Qillat-e- *Ifrac-e- Darqiyya* (Hypothyroidism) mentioned in Unani medicine are alteration in Asbab-e- Sitta Zarooriyah (six prerequisites for existence), including Ghair Tabayi Balgham (Abnormal Phlegm), Zoaf-e-Dimagh (Debility of Brain), Zoaf-e- Kabid (Debility of Liver), Zoaf-e- Tihal (Splenic Debility), Zoaf-e- Gurdah (Renal Debility), Sul- Qinyah (Anemia), Qillat-e- Harkat (Sedentary life), Ghair Tabayi Istifragh (Excessive Evacuation) etc.

#### ➤ Symptoms of Hypothyroidism:<sup>(24,25)</sup>

- Weakness
- Dry skin
- Constipation
- Gain in weight
- Lethargy
- Pallor of lips
- Loss of hair
- Edema of eyelids
- Sensation of cold
- Anorexia
- Coarseness of hairs
- Deafness

#### ➤ Correlation of symptoms of Sue Mizaj Barid with symptoms of hypothyroidism:<sup>(25,26)</sup>

- Dry and coarse skin
- Thick tongue
- Excessive sleep
- Low volume pulse
- Palpitation
- Puffiness of face
- Diminished
- Dementia
- Decreased appetite

➤ **Investigation:**

**Table 1: Normal Thyroid Profile** <sup>(27)</sup>.

Analyte	Serum levels in	
	SI units	Conventional units
T3	0.92 – 2.78 n mol/L	60-181 ng/dl
T4	58-140 n mol/L	4.5-10.9 g/dl
TSH	0.5-4.7 m U/L	0.5-4.7 U/ml
FT3	0.22-6.78 p mol/L	1.4-4.4 pg/ml
FT4	10.3-35 p mol/L	0.8-2.7 ng/dl
FTHS	4.2-13	4.2-13

**Table 2: Interpretation of Thyroid Function Tests :** <sup>(27, 28)</sup>

TSH normal T3, T4	TSH high T3, T4 normal	TSH high T3, T4 low or T3 normal	TSH low T3, T4 low
Euthyroid	Subclinical Hypothyroidism	Primary Hypothyroidism	Central Hypothyroidism

➤ **USOOLE ILAJ:** <sup>(5,15)</sup>

In Unani system of medicine, the principles of treatment of any disease are based on the Tadeel Mizaj, Istifragh- wa- Tanqiyah madde fasida. Owing to resemblance in the symptoms of Qillat-e-Ifraz-e- Darqiya with symptoms of Sue Mizaj Barid, this disease may also be treated on the same line of treatment. For example to restore normal Mizaj, Advia harrah may be used. For the evacuation of morbid matter particularly Madde Balghamiah, Munzijate Balgham (Phlegmatic Concoctive) and Mushilate Balgham (Phlegmatic Purgatives) should be used.

➤ **Use of Munzijate Balgham:** <sup>(7,15)</sup>

Behke badiyan 7gr, Behke kasni 7gr, Behke krafs 7gr, Behke izkhar 7gr, Asalasoos muqashshar 7gr, Barge gauzuban 7gr, Anjeer zard 5 No., Maweez munaqa 8 No., Gulqand asli 15gr. Patients are advised to take decoction (40ml) on empty stomach twice a day for a period of 2-3 weeks till the symptoms of Nuzj appears.

➤ **Use of Mushilate Balgham** <sup>(9)</sup>

Barge sana 6gr, Turbud 6gr, Turanjabeen 4gr,

Gariqoon 4gr, Magz amaltas 7gr, Shere khisht 7gr, Roghane bade anjeer 25ml. Appropriate doses of Mushilate Balgham are added to the decoction of Munzige Balgham for a period of 3-5 days to induce purgation.

➤ **Tabreede Badan:** <sup>(15,9)</sup>

This is the last step of Munzij wa Mushil Therapy usually done with the help of Mubarridat to neutralize the side effects of Mushillat on intestines. Commonly used drugs are Laube bahidana, Laube ispagol, Laube rashe khatmi, Shere unnab, Shere badiyan, Arq shahitra etc. These are used for a period of 2-3 days.

➤ **Use of Musakkinat:** <sup>(5,14)</sup>

After the completion of Istifraghe balgham patients are advised to take Harrul Mizaj Advia both single as well as compound formulation. The commonly used Musakkin advia of herbo-mineral origin are Filfil siyah, Khulanjan, Darchini, Kababchini, Salikha, Zeera, Karafs Naushader, Saji, Suhagha, Zanjabeel, Darefilfil, Zuranbad, Peepal, Abhal, Kabab khanda, Qaranfal, Podina, Gandana, etc.

compound formulations used are Har Moajeen wa Jawarishat, etc. such as Majoon Chobchini, Mojoon Zanjabeel, Majoon Khader, Majoon Talkh, Jawarish Jalinoos, Jawarish Kamoni, Jawarish Falafali, Jawarish Bisbasa, Jawarish Podina etc.

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## BRIEF REVIEW OF QOOPA (DERMATOPHYTOSIS) & ITS MANAGEMENT IN UNANI PERSPECTIVE

Shoeb Khan<sup>1</sup>, Ayesha Fatema Syed<sup>2</sup>, A.H. Farooqui<sup>3</sup>, Jaleel Ahmed<sup>4</sup>  
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### ABSTRACT

*Qooba* (Dermatophytosis) is a type of skin disease, according to Unani physician it as roughness which appears over skin surface which is associated with itching scaling & dryness, sometime fish like scale shed off from the skin, the rough area may appear black or red in colour usually the periphery is red and occasionally yellowish fluid discharge from it.<sup>1</sup> Fungal Disease have a globally distribution and are common, due to fungal infection approximately more than one billion people every year is affected.<sup>2</sup> As per the recommendation in the American Academy Of Family Physician (AAFP) antifungals should be continued for management of Ringworm, but some systemic antifungal drugs can cause hepatotoxicity.<sup>3</sup> In modern Medicine Various antifungal agent both topical and systemic have been introduce for effectively treating dermatophytic condition. The commonly used drug include azole like itraconazole, fluconazole, allylamines drugs like terbinafine and griseofulvin. The longterm drug of mainstream medicine is not advisable due to drug toxicity and their various side effect. In unani medicine the principle of management is focused at the alteration or removal of morbid material, which is the main culprit for pathology leading to development of *Qooba*. Through this paper an attempt has been made to highlight the strength of Unani medicine in *Qooba* (Dermatophytosis).

No. of Pages: 6

References: 21

**Keywords:** *Qooba*, Dermatophytosis, Fungal infection.

### INTRODUCTION

*Qooba* (Dermatophytosis) is a type of skin disease, according to unani physician it as roughness which appears over skin surface which is associated with itching scaling & dryness, sometime fish like scale shed off from the skin, the rough area may appear black or red in colour usually the periphery is red and occasionally yellowish fluid discharge from it.<sup>1</sup> *Qooba* have many synonyms like Daad, Dadru.<sup>4</sup> Dermatophytosis, Ringworm, Superficial Dermatomycosis, Tinea, Dermatomycoses.

### Literature Review

*Qooba* is a roughness which appears over the surface of

the skin in which the skin becomes peeled and scales shed off at the start it appears as a small spot over the skin surface which spread peripherally to develop a large surface area in a annulated pattern.<sup>5</sup> It resemble *sa'afa*, especially *sa'afa e yabis*. It may be *huzaz* but according to some *huzaz* is the *Qooba* of the scalp. (kerion in scalp)<sup>6</sup>

### Historical Background

*Ismail jurjani* stated in *Zakheera khwarjam shahi*, The Persian name of *Qooba* is *paryun* and in hindi it is named as *Daad*. He describe the two main cause for the existence of *Qooba*. One is *khilt-e-bad* (noxious humour) and second is *Quwat-e-tabiyat* (corrective faculty)<sup>7</sup> *Ahmad Tabri* said in *Moalejat-e-Buqratiya* as

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that *Qooba* is very similar to urticaria, affect the external surface of skin, usually it is round in shape and it affect large surface of the body.<sup>8</sup> *Hasan Al Qamri* stated That *Qooba* is caused by sanguine humour which is burnt and converted into melancholic humour, when *Qooba* is reached to muscular part it is termed as *daadkagzi*. In *daadkagzi* infection will be superfisial & If infection invasion is up to the subcutaneous tissue is called *Bhainsadaad*.<sup>9</sup> *Zakariya Razi* stated in his book *Al-Havi-Fit-Tibb* *Qooba* its classification treatment. He classified *Qooba* into *Qooba ratab* and *Qooba Yabis*, in addition to this he explored that local application of oil is beneficial to treat the *Qooba*.<sup>10</sup> *Ali Ibn Abbas Majoosi* stated in his well known book *Kamil-us-sana'a* that *Qooba* originate from *Ehtraq-e-Dam* (burnt blood), he also discussed its causes, clinical presentation and its treatment.<sup>11</sup> *Azam Khan* explained *Qooba* as roughness over skin associated with itching & scaling and red edges, he also discussed its prognosis & complication.<sup>4</sup>

#### Etiology :-

*Qooba* is caused by morbid matter due to viscous matters. If the matter is hot and has less fluid that there will be Dry *Qooba*.<sup>12</sup> The Dry *Qooba* occur due to melancholic humour and the moist one due to melancholic humour mixed with blood . it may be due to the mixture of *lateef khoon* and *mirra sauda* (abnormal black bile) and sometimes due to the intermixture of *ghaleez ratubat* (viscous substance) with *balgam e shor* (abnormal phlegm).<sup>11</sup> *Ufunat* is also one of the causes of *Qooba* as written in *Akseer e Azam*.<sup>4</sup> *Quwat e tabiya* is also responsible for *Qooba*. It deviate *khilt e bad* (nuxious humour) from vital organs towards the skin surface , rendering them safe hence any alteration in the *Quwat e tabiya* may predispose to *Qooba*.<sup>7</sup> *Allama Hakeem Kabiruddin* expalined *Qooba* in *Tarjuma-e-kabir (shara-e-asbab)* He states that It is contagious in nature caused by a particular type of *madda (maddatul Qooba)*. If the humour develops the properties of *hiddat, borquait and saudaviut* due to prescence of *maaddatul Qooba*, it might produce *Qooba* and may complicate it.<sup>13</sup> *Rabban Tabri* in his book *firdosul hikmat* he mentioned that improper functioning of *Quwat-e-hazma* results into *faasid* blood (viscous blood) which then circulate to the whole body as a result of which itching arises, it also result in *Qooba*. This *faasid* blood contains *ghilzat* and *baroodat* also the case is if *hiddat* comes into *faasid* blood and the amount of *ratoobat* declines then it may cause the formation of dry *Qooba*.<sup>14</sup>

#### Classification :-

As per Unani Classical Text also specified by eminent physician as well as writers of unani system of medicine. The clinical presentation and Classification of *Qooba* has been explained s per the causative substances.

***Qooba Damvi***: it shows something which appears to be a reddish discoloration followed by oozing on itching. It is produce by *dam* (blood), burnt and converted into *sauda* (black bile). it disappears easily on treatment.<sup>10</sup> There will be oozing but it easily curable.<sup>5</sup> it is also produce due to *fasad-e-ratubat* and *ufunat* (infection)<sup>8</sup>.

***Qooba Saudavi***: it shows a whitish discoloration this is produced by *balgam* that becomes hot and saline and converts into *sauda*.<sup>10</sup> it is produce by *sauda*, which is caused by *ehtraq* (combustion) of *balgam maleh* (saline balgam)<sup>5</sup> ***Mutaqashshir*** : scaling might be caused due to extreme dryness, sometimes it may be deep seated and resemble *bars-e-aswad*, it may appear like slough.<sup>5</sup>

***Ghairmutaqashshir*** : it does not have scale.<sup>5</sup>

***Saeekhabees***: it is spreading in nature and its cure is not easy.<sup>5</sup>

***Waqif***: it is localized and non spreading in nature.<sup>5</sup>

***Haad***: it is acute in condition which persist for short duration and is easily curable.<sup>5</sup>

***Raddi*** : it has poor prognosis and is not easily curable.<sup>5</sup>

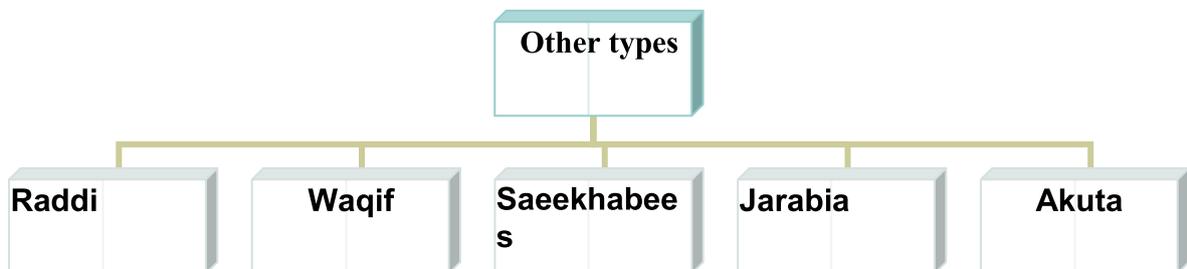
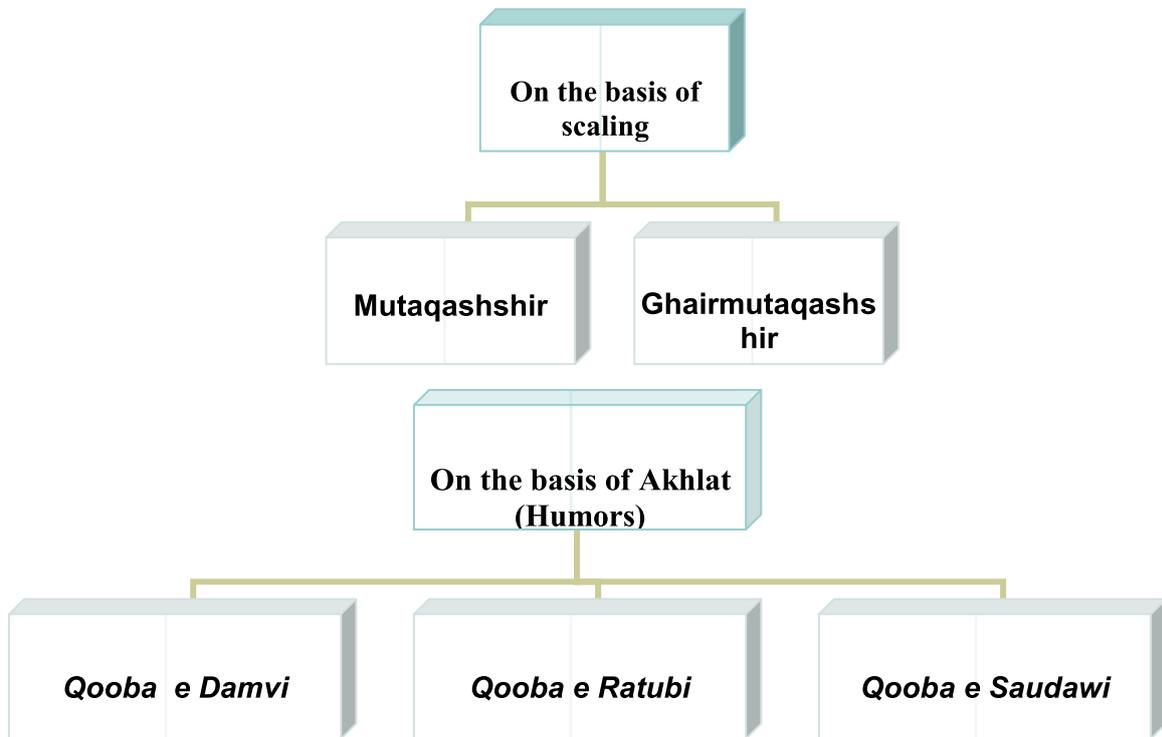
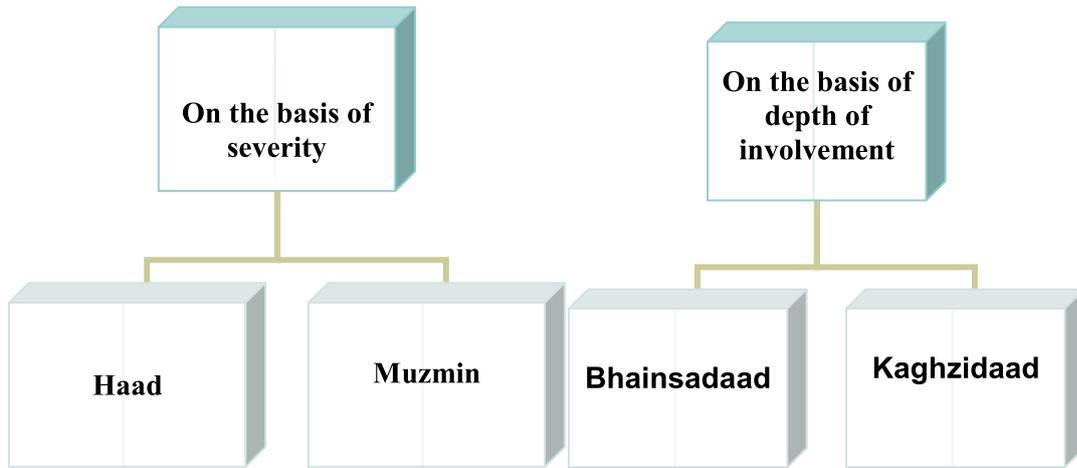
***Kaghzidaad***: when the disease is superficial.<sup>9</sup>

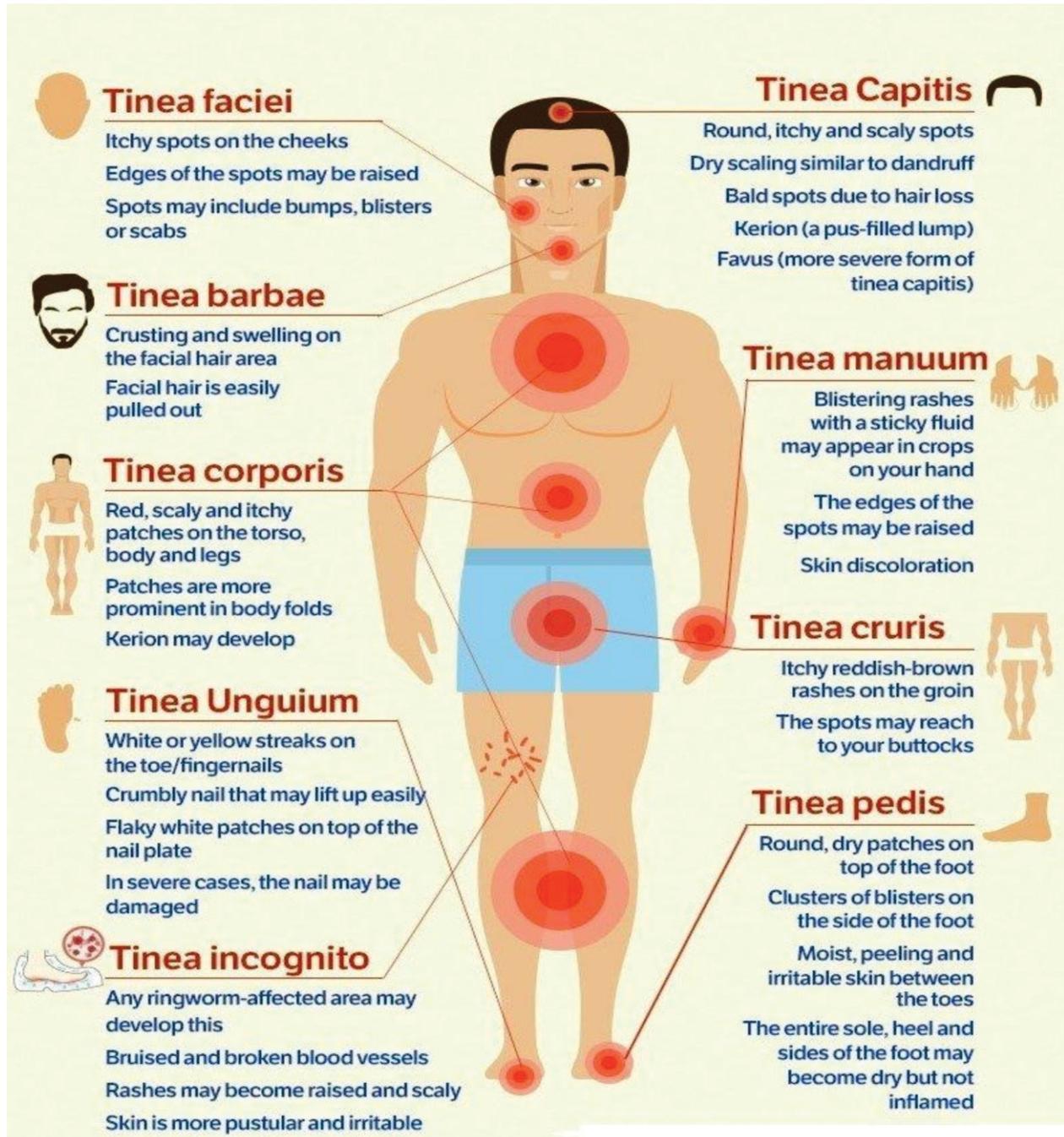
***Bhainsadaad***: when the invasion is up to the subcutaneous tissue.<sup>9</sup>

***Qooba khabees (malignant)*** : that predisposes to *Juzam* (leprosy). This condition develop due to the *hiddat, khabasat & kasafat* of the causative organism.<sup>4</sup>

***Jarabia*** : in which itching predominates and commonly involves the area of the skin over the scrotum.<sup>15</sup>

***Akuta*** : it is a type of *Qooba* found on the back & dorsum of hand.<sup>16</sup>





### Modern classification of Dermatophytosis<sup>17</sup>

#### Pathogenesis

*Tabiyat* (Natural power) is the dynamic force which pulls out the morbid matters from *Aaza e Raeesa* and throw out them towards the surface of the skin. This morbid matter is combined of *Akhlat e Harra wa lateefa* mixed with *Akhlat e Arzia wa ghaleeza*. Due to this Dissimulation in the quality of *Akhlat*, the disease spreads in both Direction. It spreads rapidly due to the

*Hiddat* and *latafat* of the *Madda*. The disease fluminates and improve faster if there is power of *Akhlat e Harra* in the causative material, while it develop and improve slowly if *Akhlat e Arzia* in excess.<sup>18</sup> In most of the unani literature the cause of *Qooba* is describe to the humoral imbalance. If the humour develop the properties of *hiddat*, *borquait* and *saudaviut* to the presence of *maaddatul Qooba*, it might produce *Qooba* and may

complicate it.<sup>13</sup> Regarding etiopathogenesis *Ahmad Tbri* said that pathogenic irritating matter escape out from minute capillaries resulting in the formation of hyperpigmented papule which later spreads and takes large circular shape.<sup>8</sup>

### Treatment

In Unani management of *Qooba* is usually according to contributing substance, Like *akhlat* (Humors), clinical sign and symptoms. Unani medicine follows the principle *Nujz wa Istefrag*. Which aims is *tankiya Badan*. In most of the cases of *Qooba* occur due to deranged *sauda* therefore in most of the cases treatment is aimed to removal of *sauda* from the body. The drug having the properties of effect of *tahleel*, *taktee* and *taleef* are used to *ghaleez maadda* for *haar* and *rakeek maadda*, which drugs having the property of *taskeen* and *tarteef* are used. treatment is aimed to removal of *morbid matter* from the body. Apart from this several *Tadbeer* (Regimental therapies) is also stated in the management of this disease.<sup>5</sup> *Fasad and Hijama bil shurt* (wet cupping) has also been said to be good by Unani physician.

**Qooba E Damvi:** *Fasad* is performed at a nearest possible site for the removal of morbid matters. *Ghassal* advia should be applied locally. For local application drug following drug can be used as a paste *Kharpaza*, *Nakhood*, *Ushna*, *Arad Baqla*, *Samag Arabi*, *samag Farsi*, *Ushq & Vinegar*, *Rogan Gandum*<sup>8</sup>

**Qooba E Saudavi:** This is the worst among all the type of *Qooba* and it does not respond easily. Therefore removal of morbid *saudavi* matter is essential. Use of *Matbookh aftimoon* and *laughazia* with *aab e halela siyah* and *zabeeb* is indicated for the same. *Fasad* (Venesection) of *Vareed e Basaleeq* is also indicated.<sup>8</sup>

**Qooba E Ratubi:** *Matbookh Aftimoon a & Ayaarij Fekra* for the removal of morbid fluid is used.<sup>8</sup> For local application :- *Aqlimia Zahab & Hartal* should be ground in *gulnar* and *gul e surkh* mixed into vinegar. *Aspand*, *kandash*, *Turbud ground* and mixed with vinegar. Grounded *Asafetida* root mixed with vinegar can be massaged over the affected area, Also the saliva and the tartar of a fasting person may be applied locally.<sup>8</sup>

### Treatment Depending On The Morphology Of The Disease:

If the disease is acute superficial and localized local application is usually enough for example *Roghan Gundum*, *Roghan Alsi*, *Roghan Badam Talkh*, *Roghan Narjil*, *Butter & Ghee*. Was mixed with *kateera* and *sibr*

can also be used as *Tila*.<sup>18</sup> If the disease is at a stage where it has penetrated beyond the skin into the muscle then relatively more potent drug like *ushq* mixed with vinegar should be applied after leeching.<sup>78</sup> If the disease is chronic and situated in deeper tissue then the management is started with the removal of morbid *saudavi* matters from the body by *fasad* (Venesection) & *ishal* (Purgation). For local application very potent drugs which are *haad* and *Muhammir* such as *Hartal* and *Khardal* are used until fresh bleeding occurs, after this healing is facilitated by the use of appropriate drug.<sup>19</sup> *Hijama bil shurt* (Wet Cupping) over the lesion and *Hammam* are also indicated in this stage.<sup>18</sup>

### Some formulation for local application by eminent Unani scholars are

*Vinegar + Ushq / Rswat / Murmuki / Asafetida / Radish seed/ Hummas / Zarawand Madharaj / Samag Arabi / Roghan Badam talkh.*<sup>20</sup> *Vinegar + Zarawand Zarnikh + Ushq + Roghan Gundum + Muqil + Waj+ Khardal*<sup>20</sup> *Vinegar + honey+ Cinnamon*<sup>20</sup> *Honey + Gaarlic / Suddab / Chuqandar water /*<sup>20</sup> *Ushq + Henna + Nakchikni*<sup>9</sup> *Sulphur + Waj + Sibr + Kundur + Samag e Arabi*<sup>5</sup>

*Sulphur + Tukhm Shadnaj/ ilakul batam*<sup>20</sup> *Sulphur + Sugar + Opium + Kaat safed*<sup>20</sup> *Curd + Olive oil + Saboos Gundum*<sup>20</sup> *Mom Zard + Zuft Romi*<sup>20</sup>

### some compound drugs fo Qooba:

*Habb E Qooba*<sup>20</sup> *Habb E Daad*<sup>20</sup> *Marham E Daad*<sup>14</sup> *Marham Zararih*<sup>9</sup> *Marham E Qooba, Roghan E Qooba.*<sup>21</sup>

### CONCLUSION

From this review article it is concluded that *Qooba* is very well documented in unani classical manuscript. Unani physicians described the etiological factor, types, pathology, clinical features, treatment in detail, they used many single, compound drug and also local application drugs in the management of *Qooba*. In most of the cases of *Qooba* occur due to deranged *sauda* therefore treatment is aimed to removal of *morbid matter* from the body.

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## EFFECT OF AN UNANI REGIMEN IN THE TREATMENT OF 'YARAQĀN' (JAUNDICE): A CASE REPORT

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### Case Report

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### ABSTRACT

Jaundice due to hepatitis viruses is considered to be a most prevalent disease worldwide. In Unani literature, it is referred as 'yaraqān' which is caused by inflammatory diseases of liver, intra or extra-hepatic obstructions, and poisoning due to drugs or animals. Several Unani drugs including *Ma'jun Dabid al-Ward*, syrup *Jigreen*, *Araq-i-Mako*, *Araq-i-Kasni*, etc are frequently used for the treatment of jaundice and liver disorders including infective hepatitis. A 16 year old male patient suffering from yellowish discoloration of sclera, skin, mucous membranes and urine, nausea, vomiting, loss of appetite and fever for one week admitted in the male ward of RRIUM, Chennai. The laboratory investigations revealed severe hyperbilirubinemia, raised serum transaminases, alkaline phosphatase and negative HBsAg. On the basis of history, clinical observations and laboratory investigations, the patient was diagnosed as a case of 'yaraqān' (jaundice) which may be due to acute viral hepatitis. A Unani regimen comprising *Ma'jun Dabid al-Ward* (5 g twice a day), syrup *Jigreen* (10 ml twice a day), *Araq-i-Mako* (75 ml twice a day), *Araq-i-Kasni* (75 ml twice a day) for 25 days, *Sharbat-i-Khaksi* (10 ml twice a day for 7 days), and *Habb-i-Tursh Mushtahi* (1 g twice a day) for 15 days were given by oral route. The fever has subsided after 7 days and the appetite improved after 15 days of the treatment. The yellow discoloration of sclera and mucous membranes started to reduce gradually from 7<sup>th</sup> day onwards. At the end of the treatment, the laboratory reports revealed that the total bilirubin, direct bilirubin, indirect bilirubin, SGOT, SGPT and ALP were within normal range. The core objective of this case report is to re-emphasize the effectiveness of Unani medicine particularly in the treatment of jaundice. Thus, this data may be helpful to increase awareness amongst the common people and scientific community for the popularity of Unani medicine in general and for the treatment of jaundice and liver disorders in particular.

No. of Pages: 9

References: 28

**Keywords:** 'Yaraqān', Jaundice, acute viral hepatitis, *Ma'jun Dabid al-Ward*, Unani medicine.

### Abbreviations:

ALP: Alkaline phosphatase; CCRUM: Central Council for Research in Unani Medicine; ESR: Erythrocyte Sedimentation Rate; GOPD: General Out-patient Department; HBsAg: Hepatitis B Surface Antigen; IMPCL: Indian Medicines Pharmaceutical Corporation Limited; LFT: Liver Function Test; RRIUM: Regional Research Institute of Unani Medicine; SGOT: Serum Glutamic-oxaloacetic transaminases; SGPT: Serum Glutamic-pyruvic transaminases; WHO: World Health Organization.

### INTRODUCTION

Etymologically, the word 'jaundice' is derived from a French word 'jaune' which means 'yellow'. Clinically, it is defined as yellowish discoloration of the sclera, skin, and mucous membranes of the body due to bilirubin present in the serum<sup>1</sup> whereas pathologically the presence of bilirubin level >3 mg referred to as jaundice.<sup>2</sup>

The new onset of jaundice is commonly occurred due to pre, intra and extra-hepatic causes. A cohort study carried out on 732 patients presented new onset of jaundice during 1999-2003 AD in the United States, has reported that 55.1% cases of jaundice were found due to involvement of liver caused by hepatitis viruses, alcohol and drugs while remaining 45% caused by extra-hepatic

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diseases.<sup>3</sup> Nowadays, the morbidity and mortality due to infections of hepatitis viruses are globally increased. According to a report of the World Health Organization (WHO), around 1.4 million people are died every year because of viral hepatitis. Hepatitis A and E viruses are transmitted into the human body through fecal-oral route due to ingestion of contaminated food and water<sup>4</sup> while Hepatitis B and C viruses spread via blood.<sup>5</sup> Though, Hepatitis A & E are considered as self-limiting infection, rarely they become serious and sometimes fatal particularly in immunocompromised patients and pregnant women.<sup>4</sup> The WHO stated that 1.4 million cases of Hepatitis A and 20 million patients of Hepatitis E are reported every year worldwide. Hepatitis E is the most commonly prevalent viral hepatitis amongst all types.<sup>5</sup> The long persistence of jaundice may cause some serious complications like kernicterus, coma, death, etc.<sup>6</sup>

The Unani science is fundamentally based on Hippocratic doctrine of humoral theory which hypothesises the presence of four humours i. e. *dam* (sanguine), *balgham* (phlegm), *safrā* (yellow bile) and *sawdā* (black bile) in the body.<sup>7</sup> The equilibrium of these humours maintains the health status of an individual. When an imbalance in the quality or quantity of anyone of them is found, the disease is appeared.<sup>8</sup> In Unani literature, the jaundice is referred as 'yaraqān'.<sup>9</sup> It is defined as yellowish discoloration of skin, mucous membranes, sclera and body fluids due to accumulation of *safrā* (bile) in the blood.<sup>10</sup> Abul Mansoor al-Hasan al-Qumri (10<sup>th</sup> century AD) stated that the jaundice is developed due to various etiological factors such as increased production of bilirubin in the blood caused by poisoning of drugs or animals, inflammation of liver, intra or extra-hepatic obstructions, following lysis from certain diseases, etc.<sup>11</sup> Apart from yellowish discoloration of eyes, skin and body fluids, several other clinical features such as nausea, vomiting, loss of appetite, thirst, bitter taste of mouth, constipation, sweating,<sup>12</sup> abdominal pain, weight loss, general body weakness, pruritus, diarrhea, anemia,<sup>6</sup> etc may also be associated with jaundice. Ibn Zuhr (1094-1162 AD) advocated that in case of acute hepatitis the jaundice is usually occurred after fever. He advised that vegetable juices prepared with watermelon and bottle gourd should be given to such patients.<sup>13</sup> Several Unani single drugs viz. *Kasni* (*Cichorium intybus* L.), *Karafs* (*Apium graveolens* L.), *Badyan* (*Foeniculum vulgare* Mill.), *Mako* (*Solanum nigrum* L.),<sup>10</sup> *Afsanteen* (*Artemisia absinthium* L.), *Aaloo Bukhara* (*Prunus domestica* L.), *Tamar Hindi* (*Tamarindus indica* L.), *Turanjbeen* (*Alhagi maurorum* Medik.), *Halela Zard* (*Terminalia*

*chebula* Retz.), *Banafsha* (*Viola odorata* L.), *Khayar Shambar* (*Cassia fistula* L.), *Bathua* (*Chenopodium album* L.), *Khubbazi* (*Malva sylvestris* L.), *Anisoon* (*Pimpinella anisum* L.), etc<sup>6</sup> and compound preparations like *Ma'jun Dabid al-Ward*, *Sharbat-i-Revand*, *Sharbat-i-Nilofar*, *Sharbat-i-Afsanteen*, *Araq-i-Kasni*,<sup>6</sup> *QursAfsanteen*, *Qurs Ward*, *Qurs Tabasheer*, *Qurs Kafoor*, *Tiryaaq-i-Kabeer*,<sup>14</sup> *Jigreen*, *Sharbat-i-Deenar*, etc are prescribed for the treatment of jaundice.

## Case presentation

### Brief history of the patient

A 16 year old male patient belonging to poor socio-economic condition visited the general out-patient department (GOPD) of Regional Research Institute of Unani Medicine (RRIUM), Chennai, Tamil Nadu, India on 3<sup>rd</sup> August 2022 with the chief complaints of yellowish discoloration of sclera, skin, mucous membranes and urine, nausea, vomiting, loss of appetite and fever for one week. The patient had a travelling history one week before the onset of clinical features. The patient was admitted in the general male ward of RRIUM, Chennai on same day for a period of 25 days. The GOPD registration number of the patient was 60056 and IP registration number was 2022/Aug/00927. According to the statement of the patient, he was healthy one week before. He felt nausea, vomiting and loss of appetite with gradual onset. He also informed that after appearing of these symptoms the color of sclera and urine got changed into yellow. He had no family history of any disease including jaundice.

### Physical examination of the patient

The physical examination of the patient was carried out in which the notable yellowish discoloration of sclera, mucous membranes and skin, and mild tenderness in the right hypochondrium due to enlargement of the liver were noted. There was no guarding or rigidity found during palpation of the abdomen. The liver was found to be slightly enlarged with margins regular and smooth. The *mizaj* (temperament) of the patient was evaluated through questionnaires designed by the Central Council for Research in Unani Medicine (CCRUM) and it was found to be *safrāwī* (bilious). The general condition of the patient was good. He was fully conscious and well-oriented. The pulse rate, blood pressure, respiratory rate, body temperature and body weight were recorded as 84/minute, 100/ 60 mmHg, 18/ minute, 98 °F and 42 kg, respectively at the time of admission.

### Laboratory investigations

At the time of admission, the patient was investigated for liver function test (LFT) including total bilirubin, direct bilirubin, indirect bilirubin, SGOT, SGPT, Alkaline phosphatase, HBsAg, complete blood count, ESR, and routine and microscopic examination of urine. The laboratory reports showed the presence of hyperbilirubinemia (total bilirubin 14.0 mg/dL; direct bilirubin 7.2 mg/dL, indirect bilirubin 6.8), raised serum transaminase (SGOT 138 U/L, SGPT 255 U/L, ALP 166 U/L) (Graph 1 & 2) and presence of bile pigment in the urine. The Australia antigen was found to be negative. The ESR of the patient was also found to be raised as 17 mm and 61 mm in half and one hour, respectively. The complete picture of blood didn't show any significant changes.

### Differential diagnosis

The differential diagnosis was made with Hepatitis B, alcoholic hepatitis and drug-induced hepatitis. The patient had no history of consumption of alcohol. He had also no history of taking anti-tubercular and other drugs.

The Australia antigen test done at base line indicates that the patient was not suffering from Hepatitis B.

### Diagnosis

The diagnosis of the disease was made on the basis of history and physical examination of the patient, and laboratory findings. The patient was diagnosed as a case of '*yaraqān*' (jaundice) which might be due to the inflammation of liver caused by acute hepatitis viruses.

### Management of the patient

#### Dietary modifications

The patient was provided diet by the hospital as per dietary plan of jaundice's patient in which easily digestible and fat restricted food items were served to him during the whole period of hospitalization. The patient was also advised to take watermelon's juice and plenty of water.

#### Unani regimen

The patient was treated with following drugs:

Drugs & Action	Manufacturer	Batch Number	Expiry	Dose	Mode of administration	Duration
<i>Sharbat-i-Khaksi</i> (Anti-pyretic)	Auliya Herbals	001	09/2024	10 ml twice a day	Oral	10 days
<i>Habb-i-Tursh</i> <i>Mushtahi</i> (Appetizer)	IMPCL	IMG-0101	05/2025	2 pills twice a day	oral	15 days
<i>Ma'jun Dabid</i> <i>al-Ward</i> (Hepatoprotective)	IMPCL	IMG-0015	04/2025	5 g twice a day	oral	25 days
<i>Araq-i-Mako</i> (Resolvent & Hepatoprotective)	Hamdard Laboratories	22AM013	03/2023	75 ml twice a day	oral	25 days
<i>Araq-i-Kasni</i> (Resolvent & Hepatoprotective)	Hamdard Laboratories	MAK 363	04/2023	75 ml twice a day	oral	25 days
<i>Syrup Jigreen</i> (Hepatoprotective)	Hamdard Laboratories	MEF096	01/2025	10 ml twice a day	oral	25 days

*Sharbat-i-Khaksi*<sup>[15]</sup>

Unani name	Scientific/ English name	Part used	Quantity
Badiyan	<i>Foeniculum vulgare</i> Mill.	Seed	100 g
Barg-i-Gaozaban	<i>Borago officinalis</i> L.	Leaves	60 g
Khaksi	<i>Sisymbrium irio</i> L.	Seed	100 g
Unnab	<i>Ziziphus jujuba</i> Mill.	Fruit	100 g
Shakar Safaid	Sugar	----	1.5 kg
Shahdeen	Honey	----	400 g
Sat Leemu	Citric acid	Crystal	4 g
Natroon Banjawi	Sodium benzoate	Salt	2 g

**Habb-i-TurshMushtahi**<sup>[16]</sup>

Unani name	Scientific/ English name	Part used	Quantity
Zanjbeel	<i>Zingiber officinale</i> Roscoe.	Rhizome	1 kg
Namak-i-Siyah	Black salt	Salt	250 g
Namak-i-Sang	Stone salt	Salt	250 g
Qaranfal	<i>Syzygium aromaticum</i> (L.) Merr. & L. M. Perry	Fruit	20 g
FilfilDaraz	<i>Piper longum</i> L.	Fruit	20 g
Kibreel Maghsool	Sulphur	Crystal	20 g
Heel Khurd	<i>Elettaria cardamomum</i> (L.) Maton	Seed	15 g
Aab-i-Leemu Kaghzi	Maxican lime	Juice	Q. S.

**Ma'junDabid al-Ward**<sup>[16]</sup>

Unani name	Scientific/ English name	Part used	Quantity
Sumbul-ut-Teeb	<i>Nardostachys jatamansi</i> DC	Rhizome	10 g
Mastagi	<i>Pistacia lentiscus</i> L.	Resin	10 g
Zafran	<i>Crocus sativus</i> L.	Style & Stigma	10 g
Tabasheer	<i>Bambusa bambos</i> (L.) Voss.	Concretion	10 g
Darchini	<i>Cinnamomum zeylanicum</i> Blume	Stem bark	10 g
Izkhar	<i>Cymbopogon jwarancusa</i> (Jones) Schult	Whole plant	10 g
Asaroon	<i>Asarum europaeum</i> L.	Rhizome	10 g
Qust Shireen	<i>Saussurea lappa</i> C.B. Clarke	Root	10 g
Gul-i-Ghafis	<i>Gentiana olivieri</i> Griseb.	Flower	10 g
Tukhm-i-Kasoos	<i>Cuscuta reflexa</i> Roxb.	Seed	10 g
Majeeth	<i>Rubia cordifolia</i> L.	Stem	10 g
LukMaghsool	Lac	Resin	10 g
Tukhm-i-Kasni	<i>Cichorium intybus</i> L.	Fruit	10 g

<i>Tukhm-i-Karafs</i>	<i>Apium graveolens</i> L.	Seed	10 g
<i>ZarawandMudharaj</i>	<i>Aristolochia rotunda</i> L.	Tuber	10 g
<i>Habb-i-Balsan</i>	<i>Commiphora opobalsamum</i> (L.) Engl.	Seed	10 g
<i>Ood Hindi</i>	<i>Aquilaria agallocha</i> Roxb	Heart wood	10 g
<i>Qaranfal</i>	<i>Syzygium aromaticum</i> (L.) Merr. & L. M. Perry	Fruit	10 g
<i>Heel Khurd</i>	<i>Elettaria cardamomum</i> (L.) Maton	Seed	10 g
<i>Waraq-i-Gul-i-Surkh</i>	<i>Rosa damascena</i> Mill.	Petals	200 g
<i>Sugar</i>	<i>Saccharum officinarum</i> L.	----	600 g

**Araq-i-Mako:**<sup>[16]</sup>

Unani name	Scientific/ English name	Part used	Quantity
<i>Mako Khushk</i>	<i>Solanum nigrum</i> L.	Fruit	1 Part
<i>Aab</i>	Water	----	20 Parts

**Araq-i-Kasni:**<sup>[16]</sup>

Unani name	Scientific/ English name	Part used	Quantity
<i>Tukhm-i-Kasni</i>	<i>Cichorium intybus</i> L.	Fruit	250 g
<i>Aab</i>	Water	----	5 lit

**Syrup Jigreen:** [Each 15 ml contains] [Proprietary Medicine of Hamdard Laboratories].

Unani name	Scientific/ English name	Part used	Quantity
<i>Tukhm-i-Kasni</i>	<i>Cichorium intybus</i> L.	Fruit	112.50 mg
<i>Barg-i-Jhao</i>	<i>Tamarix gallica</i> L.	Leaf	225 mg
<i>Mako Khushk</i>	<i>Solanum nigrum</i> L.	Fruit	112.50 mg
<i>Majeeth</i>	<i>Rubia cordifolia</i> L.	Stem	112.50 mg
<i>Revand Chini</i>	<i>Rheum emodi</i> Wall. ex Meissn	Rhizome	168.75 mg
<i>Barg-i-Kasondi</i>	<i>Senna occidentalis</i> (L.) Link	Leaf	168.75 mg
<i>Barg-i-Sanbhalu</i>	<i>Vitex negundo</i> L.	Leaf	56.25 mg
<i>Badiyan</i>	<i>Foeniculum vulgare</i> Mill.	Seed	112.50 mg
<i>Tukhm-i-Kasoos</i>	<i>Cuscuta reflexa</i> Roxb.	Seed	112.50 mg
<i>Bishkupra</i>	<i>Trianthema portulacastrum</i> L.	Leaf	56.25 mg
<i>Bao Khamba</i>	<i>Careya arborea</i> Roxb.	Bark	112.50 mg
<i>Barg-i-Bartang</i>	<i>Plantago major</i> L.	Leaf	46.87 mg
<i>Gul-i-Surkh</i>	<i>Rosa damascena</i> Mill.	Petals	140.60 mg
<i>Kateli Khurd</i>	<i>Solanum xanthocarpum</i> Schrad. & Wendl	Fruit	140.60 mg
<i>FilfilSiyah</i>	<i>Piper nigrum</i> L.	Fruit	50.62 mg
<i>Naushadar</i>	<i>Amonium chloride</i>	Crystal	468.75 mg
<i>Kushta Jast</i>	Calx of Zinc oxide	----	15 mg
<i>Sugar</i>	<i>Saccharum officinarum</i> L.	----	Q. S.

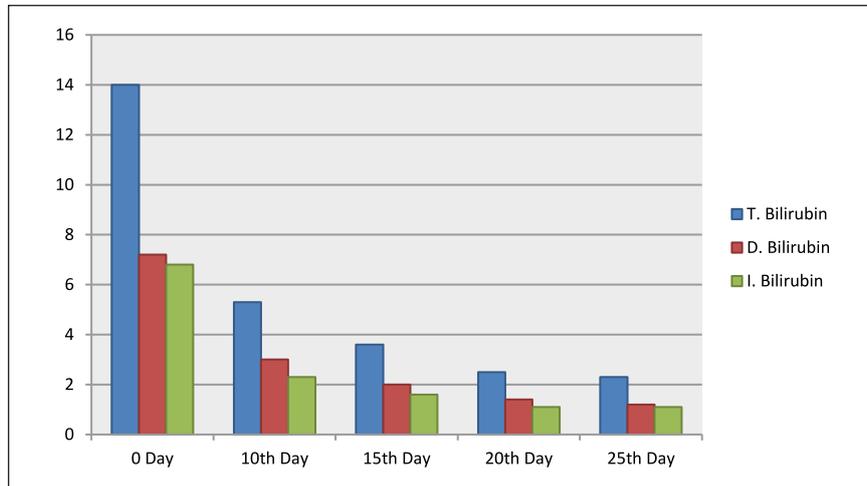
**Assessment of efficacy**

The patient was assessed through subjective and objective parameters. The clinical observation was done daily during round taken in the ward while the objective parameters like liver function tests were carried out at baseline, 10<sup>th</sup>, 15<sup>th</sup>, 20<sup>th</sup> and 25<sup>th</sup> day.

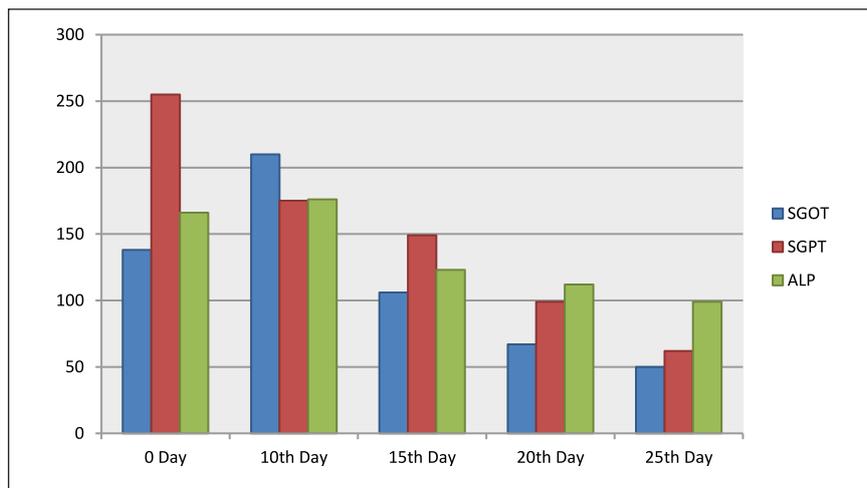
**Observations and outcome**

During clinical follow-ups, it was observed that the clinical features such as nausea, vomiting and fever were subsided gradually. The appetite of the patient was also improved after 7 days of the treatment. The body temperature became normal on 3<sup>rd</sup> day of the admission of the patient. The abdominal tenderness was not found from 7<sup>th</sup> day of the treatment. The yellowish discoloration of the sclera started to reduce from 7<sup>th</sup> day of the treatment. On 10<sup>th</sup> day of the treatment, the blood

sample of the patient was taken for liver function tests in which the total bilirubin, direct bilirubin, indirect bilirubin, SGOT, SGPT and ALP values were found to be 5.3 mg/dL, 3 mg/dL, 2.3 mg/dL 210 U/L, 175 U/L and 176 U/L, respectively. On 15<sup>th</sup> day, again these parameters were evaluated wherein the total bilirubin, direct bilirubin, indirect bilirubin SGOT, SGPT and ALP values were 3.6 mg/dL, 2 mg/dL, 1.6 mg/dL, 106 U/L, 149 U/L, and 123 U/L, respectively. On 20<sup>th</sup> day of the treatment, total bilirubin, direct bilirubin, indirect bilirubin, SGOT, SGPT and ALP values were recorded as 2.5 mg/dL, 1.4 mg/dL, 1.1 mg/dL, 67 U/L, 99 U/L, and 112 U/L, respectively. On 25<sup>th</sup> day of the treatment, total bilirubin, direct bilirubin, indirect bilirubin, SGOT, SGPT and ALP values were estimated as 2.3 mg/dL, 1.2 mg/dL, 1.1 mg/dL, 50 U/L, 62 U/L, and 99 U/L, respectively. (Graph 1 & 2)



**Graph 1: Effect of Unani regimen on liver function test [Serum Bilirubin (Total, Direct & Indirect)].**



**Graph 2: Effect of Unani regimen on liver function test (SGOT, SGPT & ALP).**

## DISCUSSION

The present case report revealed that the Unani regimen comprising *Ma'jun Dabid al-Ward*, *Araq-i-Mako*, *Araq-i-Kasni* and syrup *Jigreen* produced significant hepatoprotective and anti-inflammatory effects as evident from reduction of serum liver biomarkers in a patient suffering from jaundice which might be due to acute hepatitis viruses. In this case, *Sharbat-i-Khaksi* as anti-pyretic and *Habb-i-Tursh Mushtahi* as appetizer were given to the patient. *Sharbat-i-Khaksi* is one of the important Unani pharmacopoeial compound drugs in the form of syrup which is considered as the drug of choice for fever.<sup>7</sup> A study revealed that the chief ingredient of this preparation namely *Sisymbrium irio* produced significant anti-pyretic effect against yeast-induced pyrexia in experimental animals.<sup>17</sup> *Ma'jun Dabid al-Ward*<sup>16</sup> and syrup *Jigreen* are considered as the drug of choice for liver ailments. Shakya *et al*, 2012 has reported that *Ma'jun Dabid al-Ward* promisingly produced hepatoprotective and antioxidant activities in dose dependent manner against CCl<sub>4</sub>-induced hepatic toxicity in Swiss albino mice.<sup>18</sup> A study has reported that syrup *Jigreen* along with other medicines and venesection produced significant curative effect in a patient of hepatitis B.<sup>19</sup> The important ingredients of these formulations like *Nardostachys jatamansi*, *Pistacia lentiscus*, *Crocus sativus*, *Cinnamomum zeylanicum*, *Cymbopogon jwarancusa*, *Saussurea lappa*, *Cuscuta reflexa*, *Cichorium intybus*, *Aristolochia rotunda* and *Rheum emodi* produce resolvent, deobstruent and hepatoprotective actions.<sup>20</sup> Ali *et al*, 2000 revealed that the ethanolic extract of *Nardostachys jatamansi* rhizome significantly reduced the raised levels of serum transaminases and alkaline phosphatase in thioacetamide-induced liver injury in rats.<sup>21</sup> Omidi *et al*, 2014 evaluated the hepatoprotective effects of the extract obtained from the petals of *Crocus sativus* in acetaminophen-induced hepatic toxicity in experimental animals as evident with noteworthy reduction of the raised levels of SGOT, SGPT, ALP, bilirubin, total protein and albumin in the treatment group as compared to that of control animals.<sup>22</sup> Rakesh *et al*, 2020 has reported that the aqueous and alcoholic extracts of *Cuscuta reflexa* produced remarkable hepatoprotective activity against CCl<sub>4</sub>-induced liver toxicity in rats.<sup>23</sup> Edi *et al*, 2012 reported the potential hepatoprotective activity of ethanolic extract prepared from cinnamon bark against CCl<sub>4</sub>-induced hepatic toxicity in Wistar rats.<sup>24</sup> Ansari *et al*, 2021 revealed that the hydro-alcoholic extract obtained from the root of *Aristolochia rotunda* significantly reduced the higher levels of liver biomarkers such as bilirubin, SGOT, SGPT and ALP, and improved the histoarchitecture of liver in diseased

rats.<sup>25</sup> Urfi *et al*, 2018 reported that the leaves extract of *Tamarix gallica* showed significant hepatoprotective activity against rifampicin plus isoniazid-induced liver toxicity in Sprague-Dawley rats.<sup>26</sup> *Araq-i-Mako* and *Araq-i-Kasni* are distillate of *Solanum nigrum* and *Cichorium intybus*, respectively, and generally prescribed as vehicle along with *Ma'jun Dabid al-Ward* in the treatment of liver diseases.<sup>27</sup> *Araq-i-Mako* is separately used as resolvent, deobstruent, diuretic, analgesic, antiphlogistic in the treatment of various ailments.<sup>6</sup> Subhash *et al*, 2011 has reported the potential hepatoprotective activity of extracts of *Solanum nigrum* and *Cichorium intybus* in CCl<sub>4</sub>-induced hepatic injury in rats.<sup>28</sup> The inflammation of liver was probably subsided due to the anti-inflammatory, antioxidant, hepatoprotective and synergistic activities of a combined regimen used in this case as evident with normalization of liver biomarkers.

## CONCLUSION

The polyherbal Unani regimen comprising *Ma'jun Dabid al-Ward*, syrup *Jigreen*, *Araq-i-Mako*, *Araq-i-Kasni* has the potential in gradually mitigating all the clinical features and bringing towards normalcy raised levels of serum bilirubin, SGOT, SGPT, ALP at the end of treatment in the patient. These drugs are widely used in the treatment of liver diseases in Unani medicine. This documented evidence obtained from this case report further revealed the efficacy of these time-tested drugs of Unani system in the treatment of jaundice. Such types of evidences will be helpful to encourage the common people as well as scientific community for the use and acceptance of Unani medicine in this scientific era. But, more robust data has to be generated from clinical trials for the wider acceptance of Unani system of medicine at global level.

## Declaration of patient consent

The written consent was taken from the patient to publish his case in the journal. In the consent form, the patient was given his consent for clinical information to be reported in the journal. The patient understand that his name and initial will not be published and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

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## MANAGEMENT OF FACIAL PALSY (LAQWA) THROUGH UNANI MEDICINE: A CASE SERIES

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### ABSTRACT

*Laqwa* (facial palsy) is the most common cranial nerve motor neuropathy and it results in a characteristic facial distortion that is determined in part by the nerves branches involved. In majority of cases the cause is idiopathic. Rabban Tabri has originally described facial palsy entitled it as "*laqwa*" and explained its treatment. Thousands of people each year develop facial paralysis, a relatively common disorder with many different origins (infectious, traumatic, neoplastic, inflammatory, metabolic or idiopathic). The annual incidence has been estimated to be approximately 70 cases per 100,000 populations. Incidence of unilateral facial paralysis is 1,000 cases per 5 million populations per year. Unani scholars from various part of the world have been treating this condition since centuries successfully. Improvement of facial muscle function begins within first 3 weeks after onset of disease. Different effective regimes are available in Unani system of medicine (USM) for the treatment of *Laqwa* (facial palsy). Those treatments are effective and having fewer side effects. In the present paper the case studies of two male patients suffering from *Laqwa* (facial palsy). After series of investigation no definitive etiology could be traced out, hence considered as unilateral Facial palsy of left side, treated with Unani formulations is reported. This case series documented the successful treatment and prevention of recurrence of *Laqwa* (facial palsy) through Unani medicines. It concluded that the Unani regimen was effective and safe in the management of *Laqwa* (facial palsy). In most cases, Bell's palsy has a good prognosis and the patient will recover with outpatient therapy without complication.

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References: 8

**Keywords:** Cranial nerves, Facial palsy, *Laqwa* (facial palsy), Neuropathy, Unani system of medicine.

### INTRODUCTION

In early century of Common Era, many Arab and Unani physicians described facial palsy. Rabban Tabri has originally described facial palsy entitled it as *Laqwa*. The term "*Laqwa* (Facial paralysis)" was derived from the name of a bird "*Uqab*" due to the similarity of the facial appearance of the patient. Razes was the first scholar who explained the pathophysiology, clinical presentation, and possible treatment of facial paralysis. He has also mentioned the prognostic comments of this disease based on duration and severity. He also wrote a complete chapter on facial distortion, spasm, and paralysis in his book (*Al-Hawi*). He differentiated facial palsy from a hemifacial spasm for the first time in medical history. According to him, the symptoms start

abruptly and half of the face sags, paralyzes, disfigures and deviates to the normal side means if the muscle of left-side of the face is involved, the lip is turned to the right side and jaw and cheek of the affected part also deviate to the unaffected side. Facial paralysis is also known as '*Safasmus*', '*Farbifus*', '*Aframus*' i.e. "spasmodic musculous cranious" or "spasmodic phrenicaus cranious" that means spasm in muscles of head may be due to viscid humor (black bile) that diverge towards the affected side. It is supposed in the Greek Arab system of medicine that, excess of dryness (*Yaboosat*) in the body may also lead to *Laqwa*. First medical studies of the disease should be attributed to Avicenna. He was the first to record the differences between central and peripheral facial paralysis.<sup>1</sup> Facial

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palsy is an acute onset of peripheral facial neuropathy and most common cause is lower motor neuron facial palsy.<sup>2</sup> Facial nerve paralysis is classified as central type or peripheral type,<sup>3</sup> depending on the level of nerve injury. Central type results in paralysis of the lower part of the facial muscles on the opposite side of the lesion. The upper facial muscles are spared due to bilateral cortical connections. The peripheral type (lower motor neuron) lesion produces total facial paralysis on the same side of the lesion.<sup>4</sup> Thousands of people each year develop facial paralysis, a relatively common disorder with many different origins (infectious, traumatic, surgical procedures, neoplastic, inflammatory, autoimmune reaction, metabolic or idiopathic), which can result in weakness of the muscles of facial expression. In majority of the cases, the cause is idiopathic and most patient improve completely with outpatient therapy in 3 weeks without complication. Herpes viruses seemed to be the most possible infection agent.<sup>4</sup> Lower motor neurone (LMN) facial palsy is characterized by unilateral paralysis of all muscles of facial expression for both voluntary and emotional responses.<sup>5</sup> The human facial nerve is the seventh cranial nerve (CNVII) and comprises motor, sensory and parasympathetic components. The facial nerve (CNVII) plays a critical role in multiple complex functions of human life including mastication, speech, and successful social communication through expression of mood and emotion.<sup>6</sup>

There are various methods to diagnose facial palsy such as the House-Brackmann Grading System (H-B scale), Yanagihara Grading Scale (Y-system), and Weighted Regional Grading System (FEMA) are used. Commonly H-B scale and Y-system are mainly used in the clinical field. In conventional medicine for treatment of facial palsy includes corticosteroids or antiviral agents, and surgery.<sup>3</sup>

**Case 1: Patient information and clinical finding:** A 19-year-old male patient visited to the Mohammadia Tibia College & Assayer Hospital (Mansoor), Malegaon in outpatient department, with complaints of deviation of angle of mouth on left side, weakness of muscles of the left side of the face, unable to close the eyes, watering from the eyes, loss of taste, unable to chew, dribbling of water or saliva from the affected side of face, slurred speech from 8 days. The patient is well before 8 days ago then she developed sudden onset of headache followed by sudden weakness of muscles of left side of the face.

**On Examination:** A 19-year-old female was 160 cm tall

with weight 60 kg so BMI is 23.4 kg/m<sup>2</sup>. The heart rate was 84/min while B.P was 110/70 mm Hg with 98.6 F temperature, respiratory rate was 20/min. The heart, lung, abdomen and renal system were normal. Pallor was present and jaundice and cyanosis were absent. He was unmarried male taking mixed diet but appetite was reduced hence bowel habit not cleared with reduced frequency and quantity of micturition. The personal and family histories were negative for DM & HTN. On Nervous Systemic Examination patient was well oriented to time, place and person with intact higher mental function (memory, speech & intelligence). All **Cranial nerve** from 1 to 12<sup>th</sup> were normal in their function except 7<sup>th</sup> cranial nerve (facial nerve) is affected (watering from the eyes, unable to close the eyes). 1) Forehead frowning - not possible on left side of face. 2) Eyebrow raising - not possible on left side. 3) Eye closure - left eyeball moves upwards and outwards when the patient attempts to close it along with incomplete closure of eyelid. (Bells phenomenon). 4) Teeth showing - not possible in left side denture. 5) Blowing of cheek - not possible in left side. 5) Nasolabial fold - Nasolabial fold loss on left side. 6) Taste perception - affected on left side. 7) Dribbling of saliva - Dribbling of saliva on left angle of mouth and Spilling of food contents during eating from left side. 8) Bells phenomenon - present on left side. 9) Deviation of mouth towards right side. In left side of the body **sensory system** is slightly low as compare to right side of the body. Patient has sensation with pin and blunt objects, temperature sense (hot and cold), Vibration sense (tuning fork) and patient was able to identify the position of finger or toe of left side of body. Superficial reflexes (plantar reflex, abdominal reflexes and Wartenbergs sign) were normal. Deep reflexes (Biceps, triceps, ankle, knee and finger flexion, supinator reflexes) were normal of the body. Muscle tone was diminished in left side of face. Cardiovascular system (CVS) was normal on inspection. Apex beat is palpable in 5th ICS without any tenderness. On auscultation S1-S2 heard, no any added sound and no murmur was found. Respiratory system was normal chest was B/L symmetrical with normal movement with no any scar and tenderness, with normal resonating note and Air entry bilaterally equal (AEBE). Abdomen was scaphoid in shape, umbilicus was normal, no any scar mark or venous engorgement. On percussion dullness over the abdomen, no fluid thrill and shifting dullness. Bowel sound was 5-7t/minute.

**Case 2: Patient information and clinical finding:** A male patient of 34 year's old male patient visited to the Mohammadia Tibia College & Assayer Hospital

(Mansoor), Malegaon in outpatient department, with complaints of Deviation of angle of mouth on left side weakness of muscles of the Left side of the face, unable to close the eyes, watering from the eyes, loss of taste, unable to chew, dribbling of water or saliva from the affected side of face, slurred speech from 5 days. The patient is well before 5 days ago then she developed of sudden onset of headache followed by sudden weakness of muscles of left side of the face.

**On Examination:** A 34 year old female was 156cm tall with weight 75kg so BMI is 30.8 kg/m<sup>2</sup>. The heart rate was 88/min while B.P was 130/70 mm Hg with 98.6 F temperature, respiratory rate was 20/min. The heart, lung, abdomen and renal system were normal. Pallor was present and jaundice and cyanosis were absent. He was married male taking mixed diet but appetite was reduced hence bowel habit not cleared with reduced frequency and quantity of micturition. The personal and family histories were negative for DM & HTN. On Nervous Systemic Examination patient was well oriented to time, place and person with intact higher mental function (memory, speech & intelligence). All **Cranial nerve** from 1 to 12<sup>th</sup> were normal in their function except 7<sup>th</sup> cranial nerve (facial nerve) is affected (watering from the eyes, unable to close the eyes). 1) Forehead frowning - not possible on left side of face. 2) Eyebrow raising - not possible on left side. 3) Eye closure - left eyeball moves upwards and outwards when the patient attempts to close it along with incomplete closure of eyelid (Bells phenomenon). 4) Teeth showing - not possible in left side denture. 5) Blowing of cheek - not Possible in left side. 5) Naso-labial fold - Naso -labial fold loss on left side. 6) Taste perception - affected on left side. 7) Dribbling of saliva – Dribbling of saliva on left angle of mouth and Spilling of food contents during eating from left side. 8) Bells phenomenon – present on left side. 9) Deviation of mouth towards right side. In left side of the body **sensory system** is slightly low as compare to right side of the body. Patient has sensation with pin and blunt objects, temperature sense (hot and cold), Vibration sense (tuning fork) and patient was able to identify the position of finger or toe of left side of body. Superficial reflexes (planter reflex, abdominal reflexes and Wartenbergs sign) were normal. Deep reflexes (Bicep, triceps, ankle, knee and finger flexion, supinator reflexes) were normal of the body. Muscle tone was diminished in left side of face. Cardiovascular system (CVS) was normal on inspection. Apex beat is palpable in 5th ICS without any tenderness. On auscultation S1-S2 heard, no any added sound and no murmur was found. Respiratory system was normal chest was B/L symmetrical with normal movement with no any scar

and tenderness, with normal resonating note and Air entry bilaterally equal (AEBE). Abdomen was scaphoid in shape, umbilicus was normal, no any scar mark or venous engorgement. On percussion dullness over the abdomen, no fluid trill and shifting dullness. Bowel sound was 5-6t/minute.

**Diagnosis:** The patient was diagnosed on the basis of symptoms and cranial nerve examination other cranial nerves V, VI, IX and X were intact. Patient was diagnosed as having facial palsy (unilateral facial nerve paralysis) of the left side (lower motor neuron lesion) with the House-Brackmann facial nerve grading as Grade IV – moderately severe dysfunction. The investigations Haemogram, Liver Function Test, Kidney Function Test and Urine analysis were performed at base-line and post treatment were within in normal limits.

**Dietary restrictions:** Patient was advised to restrict Beef, Meet, chicken, oily food, spicy food and fried food. Avoid using of cold water and cold foods. He was also advised to cover the affected side with cloths (protect from cold environment) and take hot food. Daily exercise and walking was advised.

#### **Intervention and follow-up:**

Both the patient received following Unani compound formulations for 4 weeks.

- **Akseer Azraqi (AQ):** 20 mg twice a day (Azraqi Mudaber (*Strychnus Nux-Vomica Linn*) 10 gm, sugar 250 gm).<sup>7</sup>
- **Joshanda Munzij (JM):** As a decoction 100 ml twice a day (Aslussoos (*Glycyrrhiza Glabra Linn*, 5gm.), Unnab (*Zizyphus Vulgaris*, 5gm), Sapista (*Cordia Myxa*, 5gm), Khatmi (*Althaea Officinalis Linn*, 5gm), Khaksi (*Sisymbrium Irio Linn*, 5gm), Gauzaba (*Borago Officinalis Linn*, 5gm), Adhosa (*Justicia Adhatoda*, 5gm), Ustekhudoos (*Lavandula Stoechas*, 5gm), Khubazi (*Common Mallow*, 5gm)).<sup>7</sup>
- **Akseer Momiya (AM):** 5 mg twice a day (Shibb-e-yamani (*Alum*) 100gm and Shingraf (*Cinnabar*) 100gm).<sup>7</sup>
- **Habb-e-Balchad (HB):** 2 tablet twice a day ( Balchadh (*Nordostachys Jatamansi*, 50gm), Alovera 50gm, Kafoor (*Cinnamomum Camphora*, 50gm), Neem (*Azadirachta Indica*, 50gm), Hildeet (*Ferula Foetida Regel*, 50gm).<sup>7</sup>
- Ø **Rogan-e-Farfune (Masiha):** Khardal oil (*Brassica Nigra*) 1lit, Farfune 20gm, lahsan (*Allium saivum*) 50gm.<sup>7</sup>

➤ **Aqirqarha** (*Spilanthes Acmella*): Bar-e-Mazug (Madugh).<sup>8</sup>

In Unani system of medicine these formulations are used to treat clinical conditions such as *Laqwa* (Facial palsy), *Zofe Asaab* (Weakness of nerves, Neurasthenia), *Falij* (Hemiplegia), *Wajaul asaab* (Neuralgia), *Irq-un-nisa* (Sciatica), *Sudda-e-urooq* (Obstruction in Vessels), *Waja-ul-mafasil* (Arthritis), *Sara* (Epilepsy). The patient was followed up every 8 days to monitor his health condition for 4 weeks. The patient was supplied medicines from the dispensary of the hospital every 8 days to observe compliance to the therapy.

**Observation and outcome**

It was observed that patient had the complaints of

difficulty in speech and swallowing at base line which improved after 8 days of treatment at first follow up. The other symptoms resolve till the end of the treatment within 15days and post treatment follow up period of 1 month. The vitals of the patient remained stable during course of observation and treatment. Complete blood picture, the kidney function (serum creatinine and blood urea nitrogen) and liver function profile (SGOT, SGPT, Serum Alkaline Phosphatase, Serum bilirubin) at base line and post treatment were within normal. It was also observed that there no adverse drug reaction during the treatment period.

**Comparison of subjective parameters:**

**House Brackmann Scale:**

Parameters	Before	After 7 days	After 15 days
Deviation of mouth towards right side	Grade IV	Grade 2 – Slightly deviated Decreased By 20%	Normal
Unable to blow the Cheeks	Grade II	Grade 1 – Poor cheek bulge	Normal
Improper closer of Eyes	Grade IV	Grade 2 – Slow but complete eye closer	Normal
Lift up eyebrows	Grade IV	Grade 2 –Mild range of elevation	Normal
Smiling sign	Grade III	Grade 2 – Month angle rises no lip arching on weak	Normal

**Case 1 photographic Assessment:**



**Case 2 photographic Assessment:**



## DISCUSSION

Facial nerve paralysis is the most common neurological disorders affecting cranial nerves. It results in a characteristic facial distortion that occurs to form of loss of facial expression. In this case series, it was observed that the Unani regimen comprising of three formulations *Akseer Azraqi*, *Joshanda Munzij*, *Akseer Momiyai*, *Habb-e-Balchadh* and *Aqirqarha* were effective and safe in the management of *Laqwa* (facial palsy). This Unani regime was formulated keeping in mind the principles of treatment for nervous disorders as per therapeutic approach of Unani System of Medicine. Nervine tonic and Nervine stimulant are used for the management of nervous disorders. The effectiveness of the Unani regimen in these cases might be explained in terms of pharmacological actions of the formulations which mainly nerve stimulating, anti-hemorrhagic, anti-inflammatory activity, cardio-protective activity, hypotensive, diuretic, immune tonic, rejuvenates, anti-Parkinson activity, Concoctive of Phlegmin, Neuroprotective activity and anti-coagulation activity and vascular dilator properties present in their ingredient. The face was paralyzed at baseline but after 2 weeks of treatment, the face becomes almost normal. There were no complaints of weakness and disability.

***Akseer Azraqi and Akseer Momiyai***: this compound is useful as *Muqawwi-i-A'sab* (nerve tonic) and *Muharriki-i-A'sab* (nerve stimulant) in USM.<sup>7</sup>

***Joshanda Munzij***: Contain *Glycyrrhiza Glabra Linn* the study conducted by Ojha et al. evaluated the cardioprotective effect of *Glycyrrhiza Glabra* against ischemic reperfusion injury. Another study carried by chakravathi kk et al showed memory enhancing property. The study conducted by Al-Snafi demonstrated that hypotensive activity of *Cordia Myxa*. Unripe fruit of *Cordia Myxa* decreased rabbit blood pressure due to activation of parasympathetic ganglia and dilation of peripheral blood vessels. Another study showed neuroprotective effect (reperfusion of cerebral tissues in focal necrosis 200 mg/kg), memory enhancing and reduce cerebral oedema in brain stroke (100-400 mg/kg) of *Lavandula Stoechas* oil.<sup>7</sup>

***Habb-e-Balchadh***: The study conducted by SAHU R et al showed effectiveness of *Nordostachys Jatamansi* in focal ischemia by its antioxidant property. The study carried out Mahendra P. demonstrated that antihypertensive effective, vasodilation effect and neuroprotective effect of *Ferula Foetida Regel*.<sup>7</sup>

***Aqir-e-Qarha***: The study conducted by Badhe SR, et al. showed that root extract of *Anacyclus pyrethrum* produces antidepressant activity. Ethanollic root extract of *Anacyclus pyrethrum* showed an anticonvulsant activity investigated by Mandgary A et al. *Anacyclus pyrethrum* was also significant muscle relaxant activity in dose dependent manner. Ronald DC et al. was investigated a Memory Enhancing activity of *Anacyclus pyrethrum*. Another study the ethanollic root extract of *Anacyclus pyrethrum* (50-200 mg/kg) was increased level of cholinesterase in brain. Therefore, it increases activity of memory in scopolamine induce amnesia in albino rat through enhancing central cholinergic neurotransmission.<sup>8</sup>

## CONCLUSION

*Laqwa* (facial palsy) is a Facial nerve paralysis is the most common cranial nerve motor neuropathy. In majority of the cases, improvement of facial muscle function begins within first 3 weeks after onset of disease. Bell's palsy usually has a good prognosis and participant will improve with outpatient therapy. According to the Unani concept, many factors are responsible such as *fasad mizaj barid*. Effective management is resolving symptoms and countering the recurrence of the disease. The affordability, availability, and side effects of prolonged use of allopathic drugs remain a challenge and concern. The discovery of safer and more effective anti-hemiplegic drugs remains an area of active research at present. Excellent tolerance and acceptability were observed in a patient without any reported side effects. These results indicate that Unani compound formulations produce significant improvements in subjective and objective parameters. Hence, it may be concluded that the above drugs can be used safely and effectively for the treatment of *Laqwa* (facial palsy). Randomized clinical trials are needed to reveal a new and novel therapeutic option for satisfactory treatment of *Laqwa* (facial palsy) through Unani classical drugs.

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## STUDY TO EVALUATE THE EFFECT OF AABZAN OF WARM WATER IN CASES OF INSHEQAQ MAQADHAAD (ACUTE ANAL FISSURE)

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### ABSTRACT

*Insheqaq Maqadhaad* (Acute Anal fissure) is an ulcer in the longitudinal axis of the lower anal canal. Clinical presentation of patients includes Common in middle aged women, not in elderly. Constipation, bleeding discharge and stools are hard pellet like and there is drop of blood or streaks of fresh blood. Chronic fissures are characterized by a hypertrophied anal papilla internally and a sentinel tag externally (both consequent upon attempts at healing and breakdown), between which lies the slightly indurated anal ulcer overlying the fibers of the internal sphincter. When chronic, patients may also complain of itching secondary to irritation from the sentinel tag, discharge from the ulcer or discharge from an associated intersphincteric fistula, which has arisen through infection penetrating via the fissure base. In Aabzan Therapy only hips are immersed in medicated water, level of water should not be above navel (umbilicus). This therapy is very common and is used to relieve pain and discomfort of lower and upper limbs. It is indicated in Anal fissure, hemorrhoids, rectal prolapsed, uterine prolapsed, oligomenorrhoea, hysteria, dysentery, diarrhoea, cystitis, uterine cramps, vaginitis, IBS and proctitis. Present study was conducted on 30 Lord's anal dilatation post operative patients of *Insheqaq Maqadhaad* (Acute Anal fissure) to evaluate the effect of Aabzan of warm water in cases of *InsheqaqMaqadhaad*(Acute Anal fissure). The significant reduction in various scores was found after the completion of the study.

No. of Pages: 4

References: 21

**Keywords:** *Insheqaq Maqadhaad*, Acute Anal fissure, Aabzan.

### INTRODUCTION

*Insheqaq Maqadhaad* (Acute Anal fissure) is an ulcer in the longitudinal axis of the lower anal canal. Commonly it occurs in the midline, posteriorly more common in males, but can also occur in the midline anteriorly more common in females. 95% of anal fissure in men are posterior, 5% are anterior, 80% of anal fissure in females are posterior, 20% are anterior<sup>1,2,3,4</sup>

Clinical presentation of patients includes Common in middle aged women, not in elderly, Constipation, bleeding discharge. Stools are hard pellet like and there is drop of blood or streaks of fresh blood. Although simple epithelial splits, acute anal fissures are, because of their location involving the exquisitely sensitive anoderm, characterized by severe anal pain associated with defecation, which usually resolves spontaneously

after a variable time only to recur at the next evacuation, as well as the passage of fresh blood, normally noticed on the tissue after wiping. Chronic fissures are characterized by a hypertrophied anal papilla internally and a sentinel tag externally (both consequent upon attempts at healing and breakdown), between which lies the slightly indurated anal ulcer overlying the fibers of the internal sphincter. When chronic, patients may also complain of itching secondary to irritation from the sentinel tag, discharge from the ulcer or discharge from an associated intersphincteric fistula, which has arisen through infection penetrating via the fissure base.

Aabzan therapy is cheapest, simplest and non-invasive method of regimental therapy. In this kind of bath only hips are immersed in medicated water, level of water should not be above navel (umbilicus). This therapy is

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very common and is used to relief pain and discomfort of lower and upper limbs.<sup>2,5,6,7,8</sup> Abu bakar Mohammad Bin ZakariyaRazi, writes in his book *Kitab-ul-Haawi* that use of Aabzan to relieve pain and reduce inflammation of inshiqaq Maq'ad.<sup>9,10,11</sup>

In Aabzan therapy the patient is asked to sit in medicated warm water (95-105° F) made from mentioned herbal medicine for 10 to 15 minutes for 28 days.<sup>12,13</sup>

Types of Aabzan therapy are

- **Aabzanhar:** Temperature of water should be between 95-105°F.
- **Aabzanbarid:** Cold water is used in this type, to manage chronic pain due to trauma, injury and oedema.
- **Aabzanmotadil:** Temperature of water should be neutral; patient with diabetic neuropathy can use this type of Aabzan very safely.
- **AabzanMurakab:** Is alternate hot and cold sitz bath, that is alternate cycle of harabzan for five minutes followed by baridAabzan one minutes, this type has soothing effect.<sup>9,21</sup>

Aabzan therapy dilates blood vessels, increases capillary permeability, increases blood flow, and stimulates nerve end. It is indicated in Anal fissure, hemorrhoids, rectal prolapsed, uterine prolapsed, oligomenorrhoea, hysteria, dysentery, diarrhoea, cystitis, uterine cramps, vaginitis, IBS and prostatitis.<sup>14,15,16</sup>

Open wound, pressure sores, acute fever, skin infection, seizures, Reynaud's disease, acute hemorrhagic state, diabetic neuropathy are the conditions in which Aabzantherapy is contraindicated.<sup>6,17,18,19,20</sup>

**MATERIALS AND METHOD**

The present study was an open label clinical study to evaluate the effect of sitz bath of warm water. Approval from the institutional ethical committee has been obtained before starting the study. In the present study 30 Lord's anal dilatation post operative patients insheqaqmaqadhaad (acute anal fissure) of 20 to 50 years of age and either gender were included. The duration of treatment was 28 days. The patients were advised to take sitz bath of 5 liters of warm water for 30 minutes every alternate day. The clinical symptoms were recorded on 0, 7<sup>th</sup>, 14<sup>th</sup>, 21<sup>st</sup>, 28<sup>th</sup> day.

**OBSERVATIONS AND RESULTS**

**Table 1) Mean pain score (VAS).**

Pain score	(n=30)	
	Mean	SD
Day 0	2.50	0.49
Day 7	1.50	0.52
Day 14	0.51	0.31
Day 21	0.00	0.00
Day 28	000	0.00

The mean ± SD of pain score at day 0 was 2.50 ± 0.49 and at day 28 it was 0.00 ± 0.00.

**Table 2: Mean oozing score.**

Oozing score	(n=30)	
	Mean	SD
Day 0	2.40	0.50
Day 7	1.40	0.49
Day 14	0.43	0.20
Day 21	0.00	0.00
Day 28	0.00	0.00

The mean ± SD of oozing score at day 0 2.40 ± 0.50 and at 28 day it was 0.00 ± 0.00 and 0.00 ± 0.00.

**Table 3: Mean wound healing score.**

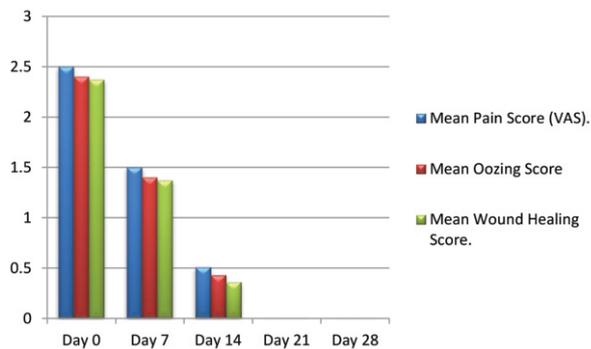
Wound healing score	(n=30)	
	Mean	SD
Day 0	2.37	0.49
Day 7	1.37	0.47
Day 14	0.36	0.19
Day 21	0.00	0.00
Day 28	0.00	0.00

The mean ± SD of wound healing score at day 0 was 2.37 ± 0.49 and at 28 day it was 0.00 ± 0.00.

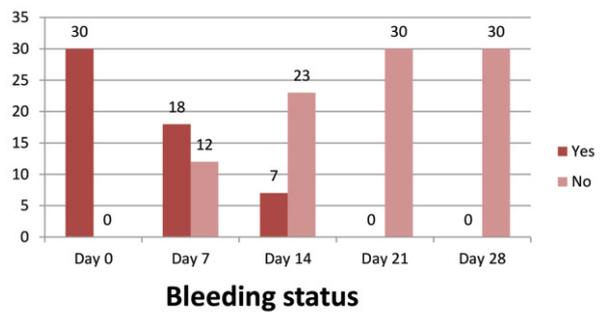
**Table 4: Bleeding status.**

Bleeding		(n=30)	
		n	%
Day 0	Yes	30	100.0
	No	0	0.0
Day 7	Yes	18	60.0
	No	12	40.0
Day 14	Yes	7	23.3
	No	23	76.7
Day 21	Yes	0	0.0
	No	30	100.0
Day 28	Yes	0	0.0
	No	30	100.0

At day 0 all 30 cases had bleeding and at day 28 no patient had bleeding.



**Graph 1: Mean scores of Pain (VAS, Oozing, and Wound Healing).**



**Graph 2: Bleeding status.**

**Conclusion:** The present study was clinical study to evaluate the Aabzan of warm water in Lord's anal dilatation post operative patients of *Insheqq Maqadhaad* (Acute Anal fissure). The study was conducted on 30 patients at our Unani Hospital IPD. It was observed on Lord's anal dilatation post operative patients of *InsheqqMaqadhaad* (Acute Anal fissure). Patients were advised to take Aabzan of 5 liters of warm water for 30 minutes on every alternate day. The clinical symptoms were recorded on 0, 7<sup>th</sup>, 14<sup>th</sup>, 21<sup>st</sup>, 28<sup>th</sup> day. The significant reduction in mean score was found after completion of the study.

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## CLOVE/QURANFUL (*Syzygium aromaticum* L.): A REVIEW ON ITS POTENTIAL BENEFITS IN UNANI MEDICINE, BIOACTIVITIES AND CURRENT SCIENTIFIC APPLICATIONS

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### Review Paper

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### ABSTRACT

**Background:** Herbal drugs have been shown to be a valuable source of new pharmaceutical molecules that have been utilised to treat serious disorders. Clove (*Syzygium aromaticum* L.) is a plant-derived drug with a long history of usage in Unani medicine due to its numerous pharmacological benefits attributable to its phytoconstituents.

**Aims and objectives:** The basic aim of this article is to present a comprehensive report on the potential benefits of clove as described in the Unani system of medicine as well as present an analysis of contemporary scientific researches in order to explore the prospects for its application.

**Materials and methods:** Classical data were collected from the manuscripts of Unani medicine like Al Qanoon Fit Tib, Khazainal-Advia, Makhzanal-Advia, Muheet-i-Azam, Al-Jamili Mufradatal-Advia wa'l Aghziya, etc. An online search was performed in Pub Med, Scopus, Wiley Online Library and Google Scholar to elucidate the various pharmacological activities of clove.

**Results:** The potential of clove shown by its chemical composition, therapeutic use and bioactivities revealed its anti-bacterial, anti-fungal, anti-viral, anti-oxidant, anti-inflammatory, anticancer, hepatoprotective and nephroprotective effects. Sesquiterpenes, monoterpenes, hydrocarbon, and phenolic compounds, are found in abundance in *S. aromaticu*, with eugenyl acetate, eugenol, and  $\beta$ -caryophyllene being the most important phytochemicals reported in clove oil. Several *in vitro* and *in vivo* studies have demonstrated its multiple bioactivities, exhibiting its effect on diseases including halitosis, odontalgia, thyroid cancer, rheumatoid arthritis, nephrotoxicity, and vaginal candidiasis, among others.

**Conclusion:** The several studies evaluated in this article support clove's traditional use in Unani medicine, indicating its usefulness for a variety of ailments. Future research should focus on developing new clove derivative-based formulations.

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**Keywords:** *Syzygium aromaticum*; Clove; Unani; Chemical constituents; Bioactivities.

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## 1. INTRODUCTION

The indigenous herbal approach plays an essential part in the healthcare system and has become increasingly popular in recent decades due to its natural composition, fewer side effects, and higher efficacy than synthetic drugs. Herbal medicine has the virtue of being both preventative and curative and diagnoses and treats illnesses [1]. Since phytoconstituents such as glycosides, saponins, flavonoids, steroids, tannins, alkaloids, terpenes, and others have been shown to have pharmacological effects, medicinal products have been recognised as a significant source for creating novel pharmaceutical molecules. Clove/Quranful (*Syzygium aromaticum* L. Merr. & L.M. Perry) is a dried flower bud and traditional Unani drug having numerous health benefits, particularly for people with a cold temperament, women, and the elderly [2].

### 1.1 Description and Distribution

Clove is the second most important spice in the world, next only to black pepper [3]. It's a medium-sized tree, 8-12 m in height from the Myrtaceae family and native to the Maluku Islands in eastern Indonesia. Indonesia, India, Malaysia, Sri Lanka, Madagascar, and Tanzania, particularly the island of Zanzibar, are the major clove-producing countries [4]. Clove trees are made up of leaves and buds (the tree's commercial part), and flowering bud development begins four years after planting. After that, they're harvested by hand or with the help of a natural phytohormone during the pre-flowering stage. Clove is one of the spices that might potentially be employed as preservatives in many foods, notably in meat processing, due to their antioxidant and antibacterial properties, and are widely used for various therapeutic uses and in the perfume industry [5].

### 1.2 Synonyms[6, 7]

Arabic: Qaranful

Bengali: Lavang

English: Clove

Gujarati: Lavang, Laving

Hindi: Lavanga, Laung

Kannada: Lavanga

Malayalam: Karayanpu, Krambu

Marathi: Lavang, Laung

Persian: Qaranful

Roman: Qaraflun

Sanskrit: Devapuspa, Lavangaha, Devakusuman

Tamil: Kirambum, Lavangam

Telegu: Lavangamulu, Lavangamuchettu

Urdu: Qaranful, Laung.

### 1.3 Temperament (Mizaj)

Hot and dry in third degree [7].

### 1.4 Pharmacological action

- In the Unani system of medicine, clove is documented to have Muhallil (Anti-inflammatory), Dāfi'-i-Ta'affun (Antiseptic), Mufarriḥ (Exhilarant), Musakkin (Analgesic), Muqawwī-i-Qalb (Cardio tonic), Muqawwī-i-Dimagh (Brain tonic), Munaffith-i-Balgham (Expectorant), Dāfi '-i-Tashannuj (Antispasmodic), Muqawwī-i-Mi'da (Stomachic), Muqawwī-i-Kabid (Liver tonic) and Muqawwī-i-Amā (General tonic) properties [6].
- It also possesses Muqawwi-i-Bah (Aphrodisiac) and Kasir-i-Riyah (Carminative) properties [8].

### 1.5 Therapeutic dose

0.5 to 1 g [6].

### 1.6 Part used

- **Bud:** The volatile oil derived from the dried buds contains free eugenol (70 to 90%), eugenol acetate and caryophyllene. Despite the fact that these compounds account for nearly all of the oil, they are not responsible for the fresh, almost fruity aroma of pure clove bud oil, which is owing to residues of other chemicals, the most important of which is methyl-n-amyl ketone. Clove bud oil differs from clove stem oil and clove leaf oil in that it includes a high percentage of eugenol acetate, whereas clove stem oil and clove leaf oil only contains traces of it [3].
- **Stem:** The main constituents found in clove bud oil are likewise found in clove stem oil, though in somewhat varying ratios. The percentage of free eugenol in stem oil is usually slightly higher than in bud oil. On the other hand, the stem oil contains only a trace of eugenol acetate, whereas the bud oil has been found to have up to 17% of this ester. Substances that give the bud oil its distinctive, almost fruity odour appear to be in even smaller quantities or absent totally in the stem oil, which explains the stem oil's coarser and flatter fragrance [3].
- **Leaf:** Clove leaf oil typically includes a lower percentage of total eugenol than clove bud oil; eugenol acetate is present in the leaf oil, but in very minute amounts, as it is in the stem oil. The trace chemical methyl-n-amyl ketone, which gives the bud oil its distinctive, fruity odour, is found in much smaller concentrations in the leaf oil than in the stem oil,

resulting in a much coarser and flatter Clove/Quranful (*Syzygium aromaticum* L.): A Review on Its Potential July-December 2022 120 fragrance. Only the latter (traces) of the compounds found in the stem oil (but not in the bud oil), namely sesquiterpene alcohol and naphthalene is detected in clove leaf oil [3].

### 1.7 Phytochemistry

Clove represents sources of phenolic compounds such as flavonoids, hydroxybenzoic acids, hydroxycinnamic acids and hydroxyphenylpropene. Eugenol is the main bioactive compound of clove, which is found in concentrations ranging from 9381.7 to 14650 mg per 100 g of fresh plant material. With regard to the phenolic acids, gallic acid is the compound found in higher concentration (783.50 mg/100 g). However, other gallic acid derivatives as hydrolysable tannins are present in higher concentrations (2375.8 mg/100 g). Other phenolic acids found in clove are the caffeic, ferulic, ellagic and salicylic acids. Flavonoids such as kaempferol, quercetin and its derivatives are also found in clove in lower concentrations. Concentrations up to 18% of essential oil can be found in the clove flower buds. Roughly, 89% of the clove essential oil is eugenol and 5%-15% is eugenol acetate and  $\beta$ -caryophyllene. Another important compound found in the essential oil of clove in concentrations up to 2.1% is  $\alpha$ -humulene. Other volatile constituents present in lower concentrations in clove essential oil are  $\beta$ -pinene, limonene, farnesol, benzaldehyde, 2-heptanone and ethyl hexanoate [4]. Additionally, the eugenol compound has a pleasant carbon chain link with the aromatic ring and Gas chromatography-mass spectroscopy (GC-MS) analysis demonstrated the existence of 36 components in the clove essential oil isolated by hydro-distillation including eugenol,  $\beta$ -caryophyllene, eugenylacetate, ethyl hexanoate, 2-heptanone,  $\alpha$ -humulene, calacorene, humulenol, and calamenene [5].

### 1.8 Therapeutic uses

- Clove is highly appreciated in medicine as a carminative and stimulant because it is very aromatic, has a good flavour, and imparts warming characteristics. It's also used to treat dyspepsia and flatulence. Clove, which is one of the constituents in betelnut chew, has stimulating effects. It is utilised in the making of a unique sort of cigarette for smoking in Java. Clove oil is used as a digestive aid as well as for its antibacterial and antimicrobial capabilities in the treatment of toothaches. It has a counter-irritant effect when applied externally. It is used in a number of toothpastes and mouthwashes.

Clove Bud oil is also used to flavour oral medications (dentifrices, gargles) and chewing gums, among other things [3].

- Use of clove in the Unani system of medicine is described in detail. It is reported to be effective in Bakhr al- Fam (Halitosis), Waja 'al-Asnan (Odontalgia),  $\text{Du'f-i-Mi'da}$  (Gastric debility),  $\text{Du'f-i-Jigar}$  (Hepatic insufficiency),  $\text{Sū-i-Haḍm}$  (Dyspepsia) Nafkh-e-Shikam (Flatulence) and Qulanj (Collitis) [6].
- Cough, chronic bronchial asthma, palpitation, and psychiatric illnesses are all relieved by clove use. It's also helpful in cold temperament disorders like dribbling and incontinence of urine [2].
- Clove strengthens Aza'e Raesa (Vital organs) and Arvah (Pneuma); useful for cold and moist diseases including paralysis, apoplexy, bronchitis, nausea, loss of appetite, and hiccups [8].
- According to one Unani physician Geelani, when the clove is combined with rose petals, it has a powerful exhilarating effect. Clove oil, also known as Roghan-i-Quranful is also described as a mosquito repellent and is thus utilised in the prevention of malaria. When consumed with cold water, it helps to quench thirst. When pregnant women ingest powdered cloves mixed with rock sugar syrup (Misri), they report less nausea. Constipation is relieved by combining 125 mg clove with 125 mg Jalapa (*Mirabilis jalapa* L.). Clove and Chiraita (*Swertia chirata* L.), taken in equal amounts with cold water, have been shown to help with fevers and general malady. Clove oil is used to treat Rheumatoid arthritis by applying it topically to the affected area, and it also relieves headaches when applied to the head [9].
- It is included in prescription liniments as a therapy for skin conditions like vitiligo [10].
- Clove powder ( $\text{Sufoof-i-Quranful}$ ), when taken in a quantity of 1.75 gm with milk on an empty stomach according to Unani physicians, acts as an aphrodisiac and helps with sexual debility. It also improves eyesight and helps treat corneal opacities [7].
- Moreover, 3gms of cloves given orally is used to treat vomiting in children, and a small amount of emblica and cloves extract combined with quince juice is taken orally to improve digestion [11].

**1.9 Important compound formulations**

The fact that clove is used in a variety of compound preparations, including Habb-i-Ambar, Habb-i-Ambar Indan Journal of Unani Medicine (15) 2, 2022 Shabnam Anjum Ara et al., 121 Momyae, Habb-i-Munaish Habb-i-tursh Mushtahi, Qurs-i-Tutiya-i-Kabir, Kohal-i-Roshnai, Itrifal Ghudadi, JawarishJalinoos, JawarishNarmushk, Jawarish Zarooni sada, JawarishBisbasa, Majoon-e-Kundur, JawarishOod Tursh, JawarishUtraj, KhamiraAbresham Arshadwala, M a j o o n D a b e e d u l W a r d , M a j o o n F a n j o s h , Majoon Khadar, Majoonlana, Majoon Muluki, MajoonSeer Alwi Khani, MajoonSuparipak, Roghan-e- Quranful, Roghan-e-Surkh, Araq-i-Ambar, Araq-i- Chobchini, Sunoon- i -

Mujalli, Majoon Jalali, MajoonKalkalanaj, Dawa-i-Hindi demonstrates its value [6,12].

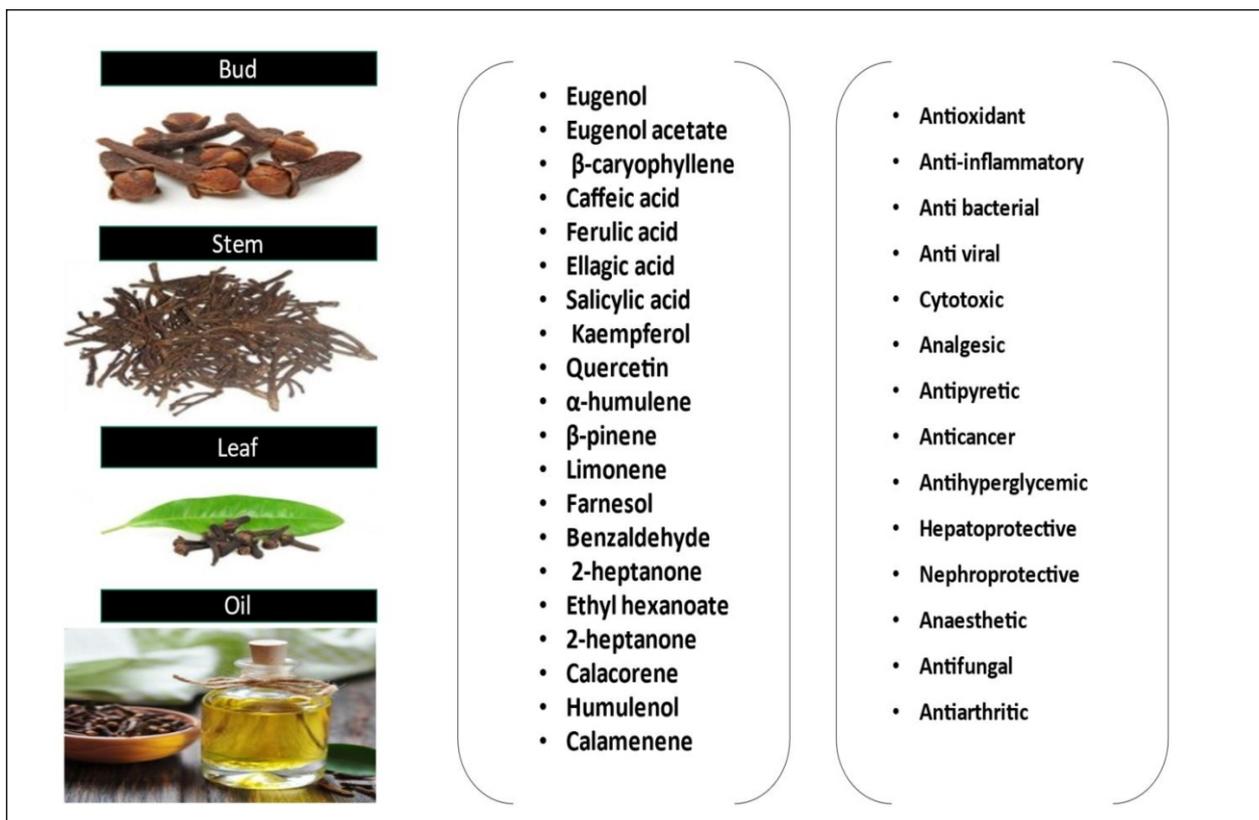
**1.10 Substitute**

Cinnamom and Bay leaf [9].

**1.11 Contraindications**

It is contraindicated in hot temperament individuals[9]. It is harmful to the kidneys and gut [2].

This article analyses and reports on a detailed and comprehensive description of Clove/Quranful, as well as several clinical, in vitro and in vivo studies that have been undertaken to determine the potential of clove.



**Figure 1: Different parts used, chief phytoconstituents and bioactivities of clove.**

**2. MATERIALS AND METHODS**

To obtain information on "Clove/Quranful" for its temperament, pharmacological activities, and therapeutic uses, a manual literature survey of classical Unani books was done. The Urdu translation of the classical books such as Al-Qanoon fil Tibb (The Canon of Medicine) of Ibn Sina (Avicenna, 980–1035 AD), Al-Jami li Mufradat al- Advia wa'l Aghziya of Ibn al Baitar (1197-1248 AD), Khazain al-Advia of Najmul Ghani, (19th century), Muheet-i-Azam of Hakeem Mohammad

Azam Khan (1806–1902 AD) were utilized for writing the article. In addition, a thorough search of electronic databases such as Pub Med, Google Scholar, and Wiley online library was conducted to collect all accessible data on the phytochemical, physicochemical, and pharmacological findings. All the articles written in English were taken and the search was conducted from March 2022 to June 2022. The Unani terminologies were described using the Standard Unani Medical Terminology [13], which was published by the Central

Council for Research in Unani Medicine (CCRUM) and the World Health Organization (WHO). 'Unani medicine,' 'Clove,' 'Quranful,' 'in vitro study,' 'in vivo study,' 'traditional medicine,' 'phytochemistry,' 'pharmacology,' and 'therapeutics,' were among the keywords used.

## RESULT AND DISCUSSION

Clove is an important drug in the Unani system of medicine and its essential oil as a food additive is recognized as safe by the FDA [14]. Figure 1 depicts the many parts of clove, as well as the main phytoconstituents and bioactivities. A considerable body of current scientific evidence supports views expressed in traditional medicine that clove has health benefits. These effects are mostly linked to antioxidant, analgesic, anaesthetic, anti-cancer, hepatoprotective, and anti-inflammatory attributes, among others.

### Scientific evidences of clove

- **Antibacterial activity:** In one of its antibacterial studies, clove seeds increased membrane permeability and oxidative stress in *Escherichia coli*, *Pseudomonas aeruginosa*, and *Staphylococcus aureus*. It indicated that the minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) were 0.06 and 0.10 mg/mL, respectively, and that the optical density and colony-forming unit (CFU) were significantly reduced. The content of superoxide anion radicals in bacterial cells increased significantly, as did the activities of superoxide dismutase and catalase, while the level of glutathione decreased, malondialdehyde increased significantly in bacterial cells, and the extract at MBC also increased the leakage of 260 nm absorbing materials and outer membrane permeability [15]. In another clove oil's antibacterial activity, it was found that it is effective against both *Escherichia coli* and *Staphylococcus aureus* and by integrating clove oil into a liposome composition, the stability of the oil was too studied. At a concentration of clove oil of 5 mg/mL, the optimal polydispersity index (PDI) (0.196), Zeta potential (24.5 mV), and entrapment efficiency (20.41 percent) of liposomes were obtained. Furthermore, by using pore-forming toxins (PFTs) to stimulate clove oil release from liposomes, selective antibacterial action for *S. aureus* was detected, and liposome-encapsulated clove oil displayed efficient antimicrobial activity for *S. aureus* [16].
- **Cytotoxic activity:** The ability of borneol and eugenol (clove oil derivatives) to modulate resistance against DNA damaging effects of H<sub>2</sub>O<sub>2</sub> on different strains of human cells malignant hepatoma cells (HepG2), malignant colon cells (caco-2) and non-malignant human fibroblasts (VH10) was investigated. The results indicated eugenol's exceptional anti-oxidative capability at all levels tested, as well as proving that eugenol's cytotoxic potential was greater than that of borneol. It was also observed that eugenol has severe DNA damaging effects on human fibroblasts (VH10), medium damaging effects on colon cells (caco-2) and non-genotoxic effects on hepatoma cells (HepG2) [17].
- **Antioxidant activity:** In one of the studies, DPPH (2,2-diphenyl-1-picrylhydrazyl) free radical scavenging, BCB (beta-carotene bleaching), and FRP [Fe(III) reducing power] techniques were used to assess the antioxidant properties of clove, sage, and oregano essential oils and the typical antioxidant used as butylated hydroxytoluene. At an accelerated oxidation level, essential oils were added to soybean oil at concentrations of 0.006 and 0.01g/ml for thirty days. The results revealed that clove oil has the strongest antioxidant activity of all the oils tested, followed by oregano and sage oil [18]. One more antioxidant activity on clove essential oil reported strong DPPH scavenging capacity but low hydroxyl radical inhibition. It has a bactericidal and inhibiting action in vitro against *S. aureus*, *E. coli*, *L. monocytogenes*, and *S. Typhimurium*. Furthermore, it was also observed that clove oil outperformed nitrite in terms of in situ antibacterial activity against *S. aureus*. The essential oil particles that were encapsulated with sodium alginate and emulsifiers had a high encapsulation efficiency, limited antioxidant activity, and robust antibacterial inhibition [19].
- **Antiviral activity:** The antibacterial, antiviral, and molecular docking activities of clove oil with two polyelectrolytes, chitosan and carrageenan, in the form of beads, was examined. The maximum non-toxic concentration (MNTC) of chitosan/carrageenan clove oil beads was found to be 31.25 g/ml, which demonstrated promising antiviral activity against Herpes simplex virus-1 (HSV-1) and was significantly higher than chitosan/carrageenan without clove oil, which had an antiviral activity of 82.94 percent and 57.64 percent [20]. In another research, eugenin was discovered to be a strong inhibitor of the Dengue virus protease (DENV). Eugenin had IC<sub>50</sub> values of 94.7 nm and 7.5 nm

against DENV serotype-2 and 3 proteases, respectively. Isobiflorin and biflorin were the other DENV protease inhibitors studied, however their inhibitory activity was lower than eugenin's [21].

- **Anti-inflammatory activity and Antipyretic activity:** In a validated human dermal fibroblast system designed to replicate chronic inflammation and fibrosis, clove essential oil (CEO) was examined on 17 protein biomarkers that play crucial roles in inflammation and tissue remodelling. Four concentrations of CEO (0.011, 0.0037, 0.0012, and 0.00041%, v/v) were studied and the effect of 0.011% CEO on genome-wide gene expression was evaluated. CEO was found to be strong anti-proliferative effect on human dermal fibroblasts at a concentration of 0.011 percent, and it significantly reduced the increased production of several proinflammatory biomarkers like vascular cell adhesion molecule-1 (VCAM-1), interferon-induced protein 10 (IP-10), interferon-inducible T-cell chemoattractant (I-TAC), and monokine induced by interferon (MIG). Collagen-I, collagen-III, macrophage colony-stimulating factor (M-CSF), and tissue inhibitor of metalloproteinase 2 were all found to be strongly suppressed by CEO (TIMP-2). It also inhibited VCAM-1 and collagen III at both the protein and gene expression levels, affecting global gene expression and signalling networks essential for inflammation, tissue remodelling, and cancer signalling processes [22]. Carrageenan-induced paw oedema and brewer's yeast-induced pyrexia were tested for their anti-inflammatory and antipyretic activities, respectively. When administered intraperitoneally (i.p.) at a dose of 33 mg/kg body weight, the effects of the clove oil were compared to those of reference drugs. Clove oil and indomethacin both exhibit anti-inflammatory properties, as indicated by a 50.6 percent and 70.4 percent reduction in carrageenan-induced mouse oedema, respectively. Furthermore, when compared to a paracetamol T-max of 3.2oC clove oil significantly reduced yeast hyperthermia at T-max by 2.7oC, with peak effects lasting 30-180 minutes and the estimated i.p. LD50 was found 161.9 mg/kg [23].
- **Anticancer activity:** The essential oil extracted from clove buds was used to make nanoscale-based emulsions using a spontaneous emulsion technique with varying concentrations of Tween 20 and Tween 80 surfactants, with cytotoxicity analysed using the MTT assay, colony formation assay, and

Annexin V-FITC assay against the thyroid cancer cell line (HTh-7). All three approaches confirmed apoptosis and a decrease in cancer cell multiplication, indicating that it is a promising cancer drug alternative [24].

- **Analgesic activity:** Aqueous extract of clove was investigated for analgesic effect in mice demonstrated by hot plate test which was reversible by naloxone. The result revealed maximal percent effect (MPE) in the animal groups treated with 50, 100, and 200 mg/kg of aqueous extract significantly higher than the control group. Pre-treatment with naloxone reduced the analgesic effects of both 100 and 200 mg/kg of the aqueous extract. Administration of all three doses of the ethanolic extract (50, 100, and 200 mg/kg) also non-significantly increased the MPE [25].
- **Antihyperglycemic activity:** The effects of dietary clove bud powder (CBP) on biochemical markers in a type 2 diabetic rat model established by a high-fat diet combined with low-dose streptozotocin (35 mg kg<sup>-1</sup>) for 30 days were investigated. Diabetic rats were fed a diet containing 20–40 g CBP per kg of body weight. The results showed that there was no significant ( $P > 0.05$ ) difference in average feed intake and weight changes between the rat groups, and that CBP supplementation lowered blood glucose levels in diabetic rats over time compared to diabetic rats that did not receive CBP supplementation (DBC). Furthermore, when compared to the DBC rat group, the CBP and metformin-treated rat groups had lower glucosidase activity [26].
- **Hepatoprotective activity:** The hepatoprotective activity of a standardized polyphenol-rich extract of clove buds (clovinol) was evaluated on wistar rats designated into three groups. The first group was given a vehicle control, whereas the second group was given ethanol at a fixed dose of 12.5 g/kg body weight orally for 30 days to induce hepatotoxicity. In the third group, clovinol (100 mg/kg body weight) was given with ethanol. In addition to the calculation of liver marker enzymes, assays of antioxidant enzymes, inflammatory markers, and liver histology examinations were performed to assess liver toxicity. Ethanol treatment significantly increased ( $p < 0.05$ ) liver function markers (SGOT and SGPT) and reduced ( $p < 0.05$ ) the antioxidant enzymes (SOD, CAT, and GPx) and Glutathione (GSH). WBC count, inflammatory markers (nitrite,

CRP, COX-2, IL-6, and TNF-) and lipid peroxidation were all found significantly higher ( $p < 0.05$ ). Clovinol supplementation reversed all of these biochemical and molecular variables, suggesting clovinol efficacy in the downregulation of alcohol-induced oxidative stress and inflammatory alterations, resulting in a considerable reduction in the associated liver disease [27].

- **Nephroprotective activity:** Clove oil proved strong nephroprotective agent against kidney damage due to the chronic use of levofloxacin in one of the studies. Clove oil at a dose of 10 mg/kg reduced the nephrotoxicity of levofloxacin based on the serum levels of creatinine, urea, and the renal MDA analysis and was also found to lessen renal histopathological injury, which was otherwise intense and diffused in the levofloxacin rats treated with placebo only. The clove oil protected both the renal function and structures and the protective effect was comparable to that of curcuma extract (hepatoprotective agent) treatment. The study found that the administration of clove bud extract for 90 days at doses up to 1 g/kg did not generate observable clinical signs of injury to the liver or kidneys in wistar rats and therefore oral administration of clove oil proved safe at doses under 1 g/kg in animal models [28].
- **Anaesthetic activity:** The efficacy of clove oil as an anaesthetic was assessed in red claw crayfish (*Cherax quadricarinatus*) as a model for freshwater crustaceans, and parameters such as body weight and sex of red claw crayfish influencing its efficacy was also observed. The test was replicated in two years, with redclaw juveniles being divided into three sizes: little (less than 5 g), medium (5–12 g), and giant (12–37 g) with each size class of at least 10 males and females placed individually in water containing clove oil concentrations of 375 and 500 l/L. Both concentrations resulted in rapid induction and recovery durations, with the 500 l/L concentration being the more effective. With the increase in crayfish size, induction and recovery times increased. Male and female crayfish had no significant differences in induction and recovery times and thus clove oil found to be an effective anaesthetic agent [29].
- **Anti-fungal activity:** *S. aromaticum* extract exhibited high antifungal activity against vaginal candidiasis and the anti-candida activity of different

*Syzygium aromaticum* extracts (methanol, ethyl acetate, n-hexane, and diethyl ether) against *Candida albicans*, *Candida glabrata*, and *Candida tropicalis* were evaluated using the disc diffusion method, and gas chromatography-mass spectrometry (GC-MS) analysis of different *S. aromaticum* extracts was performed, as well as cytotoxicity of different clove extracts against the HUH7 cell line was also evaluated. The antifungal activity of the ethyl acetate extract was found strongest, with inhibition zone diameters of 20.9, 14.9, and 30.7 mm, respectively and had a minimum inhibitory concentration of 250 g/disc against *C. tropicalis*, 500 g/disc against *C. albicans* and *C. glabrata*, and a minimum fungicidal concentration of 0.5 mg/disc against *C. tropicalis* and 1 mg/disc against *C. albicans* and *C. glabrata*. Also, the primary bioactive ingredient found in the ethyl acetate extract was eugenol (58.88 percent), followed by eugenyl acetate (23.86 percent), trans-caryophyllene (14.44 percent), and -humulene (1.88 percent). The diethyl ether extract was reported to have lowest toxicological effect, with a relative IC<sub>50</sub> of 62.43 g/ml and the methanolic extract found to have higher toxicity (IC<sub>50</sub>, 24.17 g/ml) in the cytotoxicity assay [30].

- **Anti-arthritic activity:** The study used an aqueous titration approach followed by micro fluidization to produce a controlled-release lipid platform for the efficient administration of clove oil (CO) for the treatment of rheumatoid arthritis (RA) in Freund's complete adjuvant-induced arthritic rats. High-performance thin layer chromatography (HPTLC) analysis of toluene:acetone: glacial acetic acid (90:9:1 percent v/v/v) solvent systems indicated eugenol (RF = 0.58) as the predominant component in CO. In both in vitro and in vivo biological studies, the ultra-small nanostructured lipid carriers co-loaded with CO (CONCs) greatly increased the therapeutic impact of CO, and the improved formulation inhibited blood lysosomal enzymes and proinflammatory cytokines while also improving hind limb function [31].

#### 4. CONCLUSION

The purpose of this review was to explore the usage of Clove/Quaranful (*Syzygium aromaticum* L.) in the Unani system of medicine, and based on the data obtained, it is evident that clove is a drug that has been utilised therapeutically in the Unani medicine for millennia. Unani physicians recommended clove as a single drug in therapeutics as well as in compound formulations that

are still in use today. The mechanism of action of clove pertaining to its physicochemical aspects is justified and many of its additional attributes have been verified by in vitro and in vivo pharmacological studies, demonstrating clove's multipotent effect. The principal components derived from clove essential oil are eugenol, eugenyl acetate and  $\beta$ -caryophyllene with eugenol being the major, active and safe substance as declared by FDA. Moreover, clove and its compounds have antibacterial, antioxidant, anti-inflammatory, analgesic, anticancer and anaesthetic benefits, as well as mosquito repellent, aphrodisiac, and antipyretic properties. Therefore, it is concluded that clove is an intriguing plant with tremendous potential and a rich source of valuable molecules. As the essential oil contains a number of potentially beneficial molecules, more research into their biological action is needed. Furthermore, it is proposed that future research be focused on essential oils and that experimental and clinical studies be conducted on the tested prescriptions to determine efficacy and safety in the patient's best interests.

#### Conflict of interest statement

We declare that we have no conflict of interest.

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## **DHĀK BUTEA MONOSPERMA-A REVIEW ON ETHNOBOTANICAL AND UNANI PROSPECT AS WELL AS PHYTOCHEMICAL AND PHARMACOLOGICAL PROPERTIES**

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### **Review Paper**

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### **ABSTRACT**

A large fraction of the world population, especially in the developing and underdeveloped countries depends mainly on the traditional system of medicine. India is well recognized for their traditional systems of medicine such as Unani, Ayurveda and Siddha that prevailed here from centuries and these are important components of the health care system. Unani Medicine is worldwide well ancient traditional system of medicine. There are over 25,000 herbal products documented in the traditional medical literature. In India more than 43% of the total flowering plants are reported to be of medicinal importance. The drugs in Unani system of medicine are derived from three sources i.e. plant, animal and mineral but mainly from herbs. *Dhāk* (*Butea monosperma*) one of the important medicinal plants in Unani medical system is used for therapeutic purpose. Many Unani scholars mentioned this drug in their treatises. Also, there exists a vast knowledge in the form of non codified or oral tradition for therapeutic uses of *Butea monosperma*. Different parts of the plant including bark, root, gum, leaves, flowers and seeds show pharmacological activities due to presence of Phytoconstituents like, Butrin, alkaloids, monospermoside, glucosides, triterpenes and various elements. In this paper, the botanical description of the drug is provided along with the pharmacological actions, therapeutic uses, dose and uses mentioned in Unani classical literature with ethno-botanical uses as well as phytochemical and pharmacological studies on this important plant.

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**References: 52**

**Keywords:** Dhāk, Unani medicine, pharmacological studies, *Butea monosperma*.

### **INTRODUCTION**

Since last few decays it is observed that there has been increased global interest in traditional systems of medicine. Alternative medicines are being used by about 60 percent of the world's population. These medicines are not only used by the rural masses for their primary health care in developing countries but are also used in developed countries where modern medicine dominates [1]. In the Western countries, near about 40 per cent of people are using the herbal medicine for the treatment of various diseases. Increased side effects, lack of curative treatment for several chronic diseases, high cost of drugs, microbial resistance and new emerging diseases are some driving forces for renewed public interest in

complementary and alternative medicines. According to World Health Organization (WHO) more than 80% of the world's population relies on traditional medicine for their primary healthcare needs. The World Health Organization (WHO) has also recognized the Unani System of Medicine as an alternative system to cater the health care needs of human population [2]. India has the privileged of having popular ancient traditional systems of medicine including Unani system of medicine that are practiced here and play an important role in delivering health care for humanity. Plants are treasure of medicine. Documentation of traditional knowledge accessible from classical texts on medicinal uses of plants has provided many important drugs of modern

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day. The drugs in Unani system of medicine are derived from plants, animal and mineral sources but mainly from herbs.

*Dhāk* (*Butea monosperma* Lam.) is one of the important medicinal plants. Many Unani scholars had mentioned this drug in their respective treatises. It belongs to the family Fabaceae or Leguminosae and genus *Butea*. The genus *Butea* includes various species like *Butea monosperma*, *Butea minor* and *Butea superb*, *Butea frondosa*, etc. and is widely distributed throughout India [3]. The specific name *monosperma* means one seeded and refers to the fruit with a single seed [3, 4]. Like other plants, *Dhāk* also contains number of Phytoconstituents, which are the key factors in the medicinal value of this plant. The bark, gum, leaves and flowers have pharmacological activities like *Muhallil* (anti-inflammatory), *Muqawwi-i-Bāh* (Aphrodisiac), *Hāzim* (digestive), *Mushtahī* (Appetizer), *Qātil-i-Dīdān* (Anthelmintic), etc.[4]. Commonly, *Butea monosperma* is used as tonic, astringent, aphrodisiac and diuretics. Roots are useful in filariasis, night blindness, helminthiasis, piles, ulcer and tumors.

**Methodology:** Library of Central Council for Research in Unani Medicine (CCRUM), Headquarters, New Delhi. Library of the Institute and internet were searched for Unani classical texts, ethnobotanical uses and pharmacological studies on *Butea monosperma*.

#### TAXONOMICAL CLASSIFICATION

Kingdom: Plantae

Sub-kingdom: Tracheobionta

Super division: Spermatophyta (seed plant)

Division: Magnoliophyta (flowering plant)

Class: Magnoliopsida (Dicotyledon)

Subclass: Rosidae

Order: Fabales

Family: Fabaceae or Leguminosae (pea family)

Genus: *Butea*

Species: *Monosperma* (Lam.) Taubert

Synonyms: *Butea frondosa* Koeng ex Roxb.

#### **Dīgar Nām (Vernacular names)** [3,4-12 ]:

Unani: Dhāk, Tesu, Persian: Pālah, Palās, Darakht-i-Palās; Arabic: Lāib al- Palās [7]; Sanskrit: Palāsa, Kinsuka; Hindi: Dhāk, Palāsha, Ghuniya gond, Farās, Kankeri, Tesu; Urdu: Palās English: Bastard Teak, Bengal Kino, Dony branch *Butea*, gum as *Butea* gum, Flame of the forest; Bengali: Palās Gāj; Gujarati: Khākara, Khānkar, (Kesudo, Khakapado; Marathi: Kakracha, Padas); Kannad: Muttug, Muttuga, Muttala; Telugu: Moduga, Modugu, Chettu, Kalu ka Chattu; Tamil: Palasam, Murkampoo, Purasu, Parsan;

Kannada: Muttahala, Muttuga; Malayalam: Brahmavriksham, Kimshukam, Palas; Punjabi: Chichra, Palash, Dhāk Palas; Gwalior: Beej pak; and French: Butee- feuillue .

#### **Habitation**

It is native to tropical region of southern Asia from Pakistan, India, Bangladesh, Nepal, Srilanka, Myanmar, Thailand, Laos, Cambodia, Vietnam, Malaysia and Indonesia [13]. In India, extending in its mountainous part in the North west Himalayas upto 1000 m , all over Bengal and South India. Plant grows extrovertly on open grass land and scattered in mixed forest [6].

#### **Plant Description**

It is a famous, beautiful, big sized deciduous tree [9,14] having a crooked and irregular trunk, about 50 feet in height. Trunk is about 6 to 10 feet in diameter. Branches are irregular inflorescence brown velvety. The bark is thick about 1.25 to 2.5 cm thick, light ash coloured to pale brown, curved, and is rough due to presence of rhytidoma, and scattered dark brown spots of exudates. Rhytidoma 0.2 cm thick and usually peels off leaving light brown surface, exfoliation of cork and presence of shallow longitudinal and transverse fissures; internal surface is rough and pale brown and taste slightly astringent [11]. Leaves are trifoliate, large and stipulate, 10-15 cm long and has very bitter taste [4,14]. Leaflets are coriaceous (the terminal 10-20 cm long and as broad as long), broadly obovate, glabrescent above, finely silky and strongly veined beneath with cunnate or rounded at the base. The central leaf is rounded whereas lateral leaves are long. New leaves appear in the month of *Baisākh* [11,15]. Flowers are large, scarlet and orange coloured, rigid racemes, 15 cm long. 3 flowers together form swollen nodes of stout, axillary and terminal racemes; calyx is grey clothed with silky hairs within, brown and velvety outside; the two upper teeth are connate and large whereas 3 lower ones are unequal. The corolla is 4-6 cm long and 1.7-2 cm broad, bright orange-red, covered outside with silky hairs, papilionaceous, reflexed, veined in a parallel fashion, the wing petals incurved, ad pressed to the keel, semi orbicular, acute veined, the two petals connate. Stamens diadelphous (9+1), vexillary stamen free and shortest, the other are connate. Anthers yellow linear, ovary stipitate, silky pubescent, style longer than the stamen, stigma is small truncate. Flower has slightly bitter taste [6]. These tend to be densely crowded on leaflet branches, appearing in February and stay on nearly up to April to May [16]. The flowers appear on the upper portion of the tree giving the appearance of a flame from some distance [5, 10, 16]. On the basis of flower colour, it has four varieties- (1) red

orange, (2) yellow, (3) bluish and (4) white which is rarest [4, 10, 15]. One type of *Butea* species is described as climbing shrub in Unani literature on single drugs [10, 15] and it resembles which is described as *Butea Parviflora* [3]. Petal resembles with the nail of lion [8, 15]. Flowers are known as *Gul-i-Tesu* or *Gul-i-Dhāk* and used for ornamental purpose also [15]. The pod is a flat legume. Pods are long, stalked, 12.5-20 cm by 2.5-5 cm; thickened at the sutures. Young pods have a lot of hair, a velvety cover and mature pods hang down, one seeded. Pods attain maturity in September to October [11]. Each pod contains single seed. Seed is known as *Tukhm-i-Palās*, *Tukhm-i-Pālah* or *Palās pāprah*. The seeds are flat, rounded or kidney shaped and light in weight [11, 15], it is about 25 to 40 mm long, 15 to 25 mm wide, and 1.5 to 2 cm thick, reddish brown in colour and compressed laterally, mucilaginous and oily but devoid of any taste and smell. Average weight of a seed is 1.09 gm [11]. Shell life of seed is one year [15]. The seed-coat is pale yellow or reddish-brown in colour, thin, smooth distinctly veined, and encloses two large, leafy yellowish cotyledons. Hilum is prominent; cotyledons are large, fleshy, cream coloured and almost flat laterally. The dicotyledonous embryo fills up the major portion of seed. Cotyledon consists of thin walled parenchymatous cells filled with granular proteinaceous mass and aleurone grains and other cellular contents [7, 11]. Oil is extracted from the seed [4, 15]. Exudation which is obtained from bark hardens into a red brittle resin commonly known as *Samagh-i-Dhāk*, *Samagh-i-Palās*, *Chuniya Gond*, *Kamarkas* [4,17]. It is highly beneficial for women [3,14]. The drug *Lākh* (lacquer) which is usually produced on trees like mango tree, peepal tree, babool tree but, these days, *Butea* tree is also a host to the Lac insect, which produces natural lacquer. The lacquer produced on this plant is reddish coloured and is of very good quality. People of Kheera district in Nepal is producing lacquer on this tree for its import [15].

#### **Hissa Mustāmila (Part Used):**

*Barg* (leaf), *Gul* (flower), *Samagh* (gum), *Tukhm* (seed), *Chhāl* (Stem bark), [4,6-11,18] and *Bekh* (root) also [4,8].

#### **Mizāj (Temperament):**

In the opinion of Unani scholars the temperament of plant is *Hār*, *Yābis* (Hot and Dry) [10] or *Hār*, *Ratab* (Hot and Wet) [15,18]. Unani scholars have also mentioned the temperament of its various parts that is mentioned below:

Flower- *Hār*, *Yābis* (Hot and Dry) [6] but according to some Unani physicians the temperament of flower is

*Bārid*, *Yābis* (Cold and Dry) [19] and slightly deviated towards hotness [8,15].

**Seed:** Its temperament is *Hār*<sup>3</sup>, *Yābis*<sup>3</sup> (Hot 3<sup>0</sup> and Dry 3<sup>0</sup>) [11,15] but its temperament is mentioned as *Hār*, *Tar* (Hot and Wet) in *Makhzan al-Advia* [18]

Leaf- It is *Hār*<sup>3</sup>*Ratab*<sup>4</sup> (Hot and Wet) [4]

Gum- *Bārid*, *Yābis* (Cold and Dry) [15, 17], or *Hār*, *Yābis* (Hot and Dry) [8].

Stem bark- *Bārid*<sup>2</sup>, *Yābis*<sup>2</sup> (Cold 2<sup>0</sup> and Dry 2<sup>0</sup>) [12];

#### **Phytochemical constituents of *Butea monosperma*:**

Different Phytoconstituents are present in various parts of the plant and isolated which are responsible for number of pharmacological activities.

The main constituent of the flower is triterpene and glycosides like butrin, isobutrin, coreopsin, isocoreopsin, sulphurein, monospermoside, isomonospermoside, besides butein (0.37%) and butin (0.04%). Flower also contains flavonoids, steroids, Alkaloids, Steroid, tannins and sugar. Mineral contents like magnesium, sodium, calcium, iron, nitrogen and potassium are present in the flower [6]. Seed contains fats and oil, lignin, proteins, mucilage and small amount of resin. A nitrogenous acid compound and palasonin is isolated from seeds, two glucosid- monospermosides and isomonospermoside, and butrin, isobutrin coreopsin, isocoreopsin, sulphurein- $\alpha$ -amyrin.  $\beta$ -sitoserol, and sucrose isolated from seed. Seed oil contains, glyceides of palmitic stearic, lignociric, oleic and linoleic acid. A lactone n-heneicosanoic acid-  $\epsilon$ -lactone is isolated and identified in it [7]. Root of contains glucose, glycine, glucosides and aromatic compounds. Tetramers of leucocynidin are isolated from gum and stem bark. The bright colour of the flower is attributed to the presence of chakones and auronones [3, 5, 20]. Powdered leaf revealed the following compounds - Alkaloids, cynogenic glycosides, phenolic compounds, flavonoids, terpenoids, tannins and saponins [6, 11]. Gum and bark contain kino tannic and gallic acid [3, 12].

#### **Physicochemical Standards of *Dhāk* (*Butea monosperma*)**

Physicochemical standards of a drug ascertain the quality of the drug because the therapeutic actions depend upon the secondary metabolites and chemical constituents of the drug. The variation in the standards may result in disparity in the therapeutic actions. To avoid batch to batch variation and to get desired

therapeutic effect at specified dose the standards should be checked in the crude drug before using it. The checking of standards is necessary whether drug is used as single entity or as an ingredient in the compound formulation. The following standards have been laid down for its quality check of *Gul-i-Tesu* and *Palās pāpda* by Central Council for research in Unani Medicine:

#### Flower [6]

- Foreign organic matter: Not more than 1%
- Total Ash: Not more than 7 %
  - Acid insoluble ash: Not more than 2%
  - Water soluble Ash : Not more than 6%
- Hexane: 0.74 %
- Chloroform: 0.3%
- Ethanol: 28.78%
- Distilled water: 13.48

#### Seed [11]

- Foreign organic matter: Not more than 1%
- Total Ash: Not more than 7 %
  - Acid insoluble ash: Not more than 3%
  - Water soluble Ash : Not more than 4%
- Hexane: 1.01 %
- Chloroform: 0.3%
- Petroleum ether: 1.19 %
- Solvent ether: 1.49 %

#### Af'al (Pharmacological action)

In Unani system of medicine various parts of the plant are used as these show pharmacological actions:

As per Unani medicine, flower is *Qābiz* (Astringent), *Muhallil-i-Waram* (Anti-inflammatory) as well as *Rād'e* (Repellant) *Mudirr-i-Bawl* (Diuretic), *Muqawwī-i-Bāh* (Aphrodisiac), *Mudirr-i-Hayz* (Emmenagogue) and *Muqawwī* (General tonic) [6, 14], *Daf-i-Fasād al-Dam*, *Balgham wa Safra* (removes morbid sanguine, phlegm and bile) [4,9] *Mukhrij-i-Balgham* (Expellant of phlegm) , *Mufarreh* (Exhillirant), *Muqawwī-i-Qalb* (Cardiac tonic), *Mu'addil-i-Akhlāt* (brings humours in moderate balance), *Mudirr-i-Hayz* (emmenagogue) [4, 8,10,15]; Seed is *Qatil-i-Deedan* (Anthelmintic), *Mudirr-i-Bawl* (Diuretic), *Muhallil-i-Waram* (Anti-inflammatory), *Kasir-i-Riyah* (Carminative), *Muqarreh* (Wound producing agent) (4, 8, 11,14,15). Seed also has

the property of reducing *Balgham* (Phlegm), and *Sawda* (black bile), and *Man'e Hamal* (contraceptive) like pharmacological activities [10,15]; Seed oil is *Muharrrik-i-Bāh* (sexual stimulant), *Qāt'e Safra and Qat'e Balgham* ( reduces bile and phlegm production) [4,14,15] ; Leaf is *Mushtahī* (Appetizer), *Mulayyin* (laxative ) [9, 15, 19], *Muhallil* (Resolvent) and *Muharrrik-i-Bāh* (sexual stimulant) [4]; Stem bark is *Qābiz* (astringent), *Mughalliz-i-Manī* (Semen Inspissant), *Qātil-i-Kirme Am'a* (Vermicidal) [12]. Gum is beneficial for *Kulliya* (kidney) and *Mughalliz* (Semen Inspissant), *Muqawwī-i-Zohar* (tonic for back/spine) [4,8,10], *Muqawwī-i-Reham* (Tonic for uterus) [10], *Mumsik* (Retentive), *Qābiz-i-Meda* (constipative), *Muqawwi-i-Bāh* (Aphrodisiac) and *Mujaffif* (Desiccant) [8,14]. Gum is beneficial for brain and enhances memory as well [4].

#### Istemāl (Therapeutic Uses)

Flower cures epistaxis, jaundice, pruritus, helminthiasis, swellings in the organs, boils and abscess and ringworm, '*Ushr-i-Bawl* (Dysuria), *Waj'a al-Masāna* (Cystitis), *Ehtabās-i-Bawl* (anuria), *Ehtabās-i-Tams* (Ammenorhoea) when used in various dosage form [4, 8, 10, 14, 15]. Flowers are used to cure diarrhea, predominance of bile, inflammation and gonorrhoea [6]. *Matbūkh Gul-i-Tesu* (flower decoction) is beneficial for epistaxis when used orally along with 48ml of *Sharbat 'Unnāb*. Oral administration of *Naqū* (infusion) of flower is effective in *Yarqān Asfar* (jaundice) and *Suzāk* (gonorrhoea) [4,15]. *Safūf* (powder) is also beneficial for *Suzāk* (gonorrhoea) and *Ishāl* (diarrhea) [8,14]. Flower juice is useful for helminthiasis, pruritus, and diarrhea and corrects humoral imbalance [4]. Oral administration of '*Araq Gul-i-Tesu* (flower distillate) is beneficial for heart [4]. *Takmīd* (hot fomentation) with poultice of flowers produces diuresis and increases menstrual flow [6]. Hot fomentation and sitzbath with decoction of flowers is used to reduce *Awrām* (inflammation) of the organs like oophoritis, orchitis, uterine pain and cystitis and pain associated with it [4, 14, 15]. *Natūl* (Irrigation of lukewarm decoction) and *Zimād* (Paste) prepared with flower when applied externally is useful for *Waram-i-Unsayayn* (oophoritis), *Waram-i-Khusiya* (orchitis), *Ehtabās-i-Tams* (amenorrhoea), *Ehtabās-i-Bawl* (anuria) , '*Ushr-i-Bawl* (Dysuria), *Qīla Māiyya* (Hydrocele) and diseases of kidney and urinary bladder [4, 9,]; *Safūf* (powder) of dried buds in a dose of 2-3 gm is given for constriction of vagina ([14, 15]. Seed is used as vermigogue and oral administration of seed powder is used to treat *Dīdān-i-Am'a* (Helminthiasis), *Nafakh* (Flatulence), *Amrāz-i-Kulliya wa Masāna* (diseases of

kidney and urinary bladder), *Tasammum* (poisoning), *Lasā't –ul-Huwām* (Insect bite) or snake bite, *Bawāsīr* (haemorrhoids) and is beneficial for *Sar'* (epilepsy) [4, 7,15]. It is used orally in form of decoction, linctus, powder or locally to treat these diseases [4, 15]. Eye drops prepared with *Namak Lāhorī* (Rock salt) and seed and stem bark of *Butea*, (each 1 part) ground with rose water is useful in corneal opacity. Instillation of nasal drops prepared with seed and water is effective for epilepsy, it recovers consciousness during epileptic convulsion [4]. Use of vaginal pessary prepared with seed and honey prevents conception. Local application in form of paste is effective for *Waram-i-Khusiya* (Orchitis), *Khārish* (Pruritus), *Dād* (Ringworm) and abscess. Seeds pounded with *Āb-i-Līmū* (lemon juice) or *Sirka* (vinegar) is applied on skin infection or *Dād* (ring worm) [14, 15]. Seed kernel is beneficial for *Hūmma Rib'a* (Quartan fever) when used with kernel of *Karanjwa* (*Caesalpinia bonducella* Flem.). Seed oil is effective when applied locally on inflammation and swellings of cold type, Piles, and Anal prolapse; Leaves are useful for *Dumbal* (boil) and *Dubaila* (abscess), *Jāla* (corneal opacity), *Kirm-i-Shikam* (helminthiasis), *Qūlanj Rīhī* (colic pain due to flatulence), *Bawāsīr* (haemorrhoids) [9], *Zarab wa Khilfa* (sprue) and *Kasr* (fracture) [4,19]; New leaves dried in shade, ground and taken orally in a dose of 18 gm daily in the morning for 3 days is effective for *Sayālan al-Reham* (leucorrhoea) [11,15]; Ash of leaves and branches is beneficial for *Istisqā* (ascites) [4,9]. Eating in the bowl prepared with its leaves or on the leaves enhances appetite [15]. Stem bark is useful in *Ishāl* (Diarrhea), *Jāla* (Corneal opacity); stem bark and gum is useful in *Sayalān al-Reham* (Uterine discharge), *Jiryān* (premature ejaculation), *Riqqat-i-Manī* (Thinning of semen). Gum is also effective for *Bawsāsīr* (haemorrhoids), *Hurqat al-Bawl* (burning micturition), *Qurūh-i-Masāna* (urethral and cystic wound/ulcers), *Suzāk* (gonorrhoea), *Sayalān al-Reham* (vaginal discharge), *Zo'f-i-Ām* (General weakness) and highly beneficial for women during puerperium [14]. Root is beneficial in epilepsy and haemorrhoids [4, 12, 15]. Near about all parts of *Butea* plant is useful in *Jiryān* (premature ejaculation) [19].

#### **Miqdār (Dose)**

Flower: 5-10 gm; [6]; 7- 12 gm [8]

Seed: 125-300 mg [11], 300-900 mg [7,14]; upto 875 mg [4] upto 937 mg [15]; 250 mg-1 gm [8].

Stem bark: 5-12 gm [8], 5-10 gm in decoction [12]

Leaf: 3-5 gm [8]

Gum: 1-3 gm [8]

#### **Muzir (Toxicity)**

Flower is harmless [6] but according to some physicians, it is not suitable for cold temperament personnel [8]. Seed is harmful for lungs [11]. Seed, leaf and stem bark show harmful effect on intestines and gum is not suitable for lower extremities [8].

#### **Musleh (Corrective)**

It is used to reduce adverse effects or to improve efficacy of the drug. As the various parts of the plant have some adverse effect on a particular organ therefore corrective for each part is also mentioned by Unani scholars:

*Namak* (salt) for flower [8]; '*Araq-i-Gulāb* (Rose water) [8, 11] or *Makkhan* (butter) or *Roghan Gāw* (pure ghee) [4,18] for seed; *Gulāb* (*Rosa damascena* Mill.) and *Babūna* (*Matricaria chamomilla* Linn.) for leaf and stem bark; *Katīra* (*Astragalus gummifer*), *Sandal* (*Santalum albus* Linn.) for gum [8].

#### **Badal (Substitute)**

Substitute of any drug is required in conditions where it is not available. The substitutes mentioned for various parts of the *Butea* plant by Unani scholars are as follows: Flower: *Kāsni* (*Cichorium intybus* Linn.) Leaf: *Barg-i-Shaftālū* (leaf of *Prunus persica* (Linn.) Batsch) [8] ; Seed: *Khardal* (Seed of *Brassica nigra* Linn.); Gum: *Samagh 'Arabī* (gum of *Acacia Arabica* Willd.) [8].

#### **Murakkabāt (Compound formulations)**

Drugs from plant, mineral and animal origin have been used either as single entity or in combination of more than one drug in specific proportion mentioned in Unani Pharmacopoeias and National formularies. If more than one drug has been mixed in specific proportion and method then it is called compound formulation. It is used in various dosage forms and various parts of the *Butea monosperma* are included as an important ingredient in different compound formulations of Unani system of medicine. The actions of the formulation and their therapeutic effects are also mentioned with each:

- *M'ajūn Supāri Pāk* (contains *butea* gum)- It is aphrodisiac, helps in conception, strengthens back and useful in *Sayalān al-Reham* (vaginal discharge) [21,22].
- *M'ajūn Hindī* (contains gum and stem bark)- It is *Muqawwī-i-Bāh* (Aphrodisiac) and *Mumsik* (Retentive) [22]. These parts are also included as an ingredients in various other formulations of *Safūfāt* (Powders) [21] and *Majūnāt* (semi-solid sweet preparation) which are *Muqawwī-i-Bāh*

(Aphrodisiac), *Mumsik* (Retentive) and useful in premature ejaculation and vaginal discharge [22].

- *Matbūkh Muhallil* (contains flower) [6] and water boiled with flower is an anti-inflammatory and used for *Ābzan* (Sitzbath), *Takmīd* (hot fomentation) and *Natūl* (pouring medicated water at some distance) in case of *Waram* (inflammation) of organs.
- *Habb-i-Dīdān* (contains seed): It has anthelmintic and vermifuge actions and useful for helminthiasis [11].
- *Qurs Dīdān* (containing seed): It has anthelmintic action and useful for helminthiasis [7].
- *Itrifal Dīdān* (contains seed): It has vermicide and vermifuge actions and useful for helminthiasis [7].
- *Safūf Mu'allif* (contains seed): It has aphrodisiac and retentive pharmacological action and useful for sexual debility [12].
- *Safūf Mumsik* (contains seed): It has retentive actions and useful for premature ejaculation and spermatorrhoea [21].
- *Safūf Hindī* (contains gum) and
- *Safūf Māsik al-Manī* (contains gum): These powder formulations are retentive and Semen inspissant and effective in premature ejaculation [21].
- *Safūf Sayalān* (Contains gum): Polyherbal powder preparation is *Qābiz* (styptic) and *Hābis* (astringent) by temperament and *Mujaffif* (dessicant), *Muqawwī* (tonic) by action, and is used to treat *Sayalān al Reham* (leucorrhoea). [23]

#### Ethnobotanical Uses of *Butea monosperma*

The plants of this genus are well known for their colouring matters. It is reported to possess antifertility, aphrodisiac and analgesic activities.

The stem bark is useful in indigenous medicine for the treatment of dyspepsia, diarrhea, dysentery, ulcer, sore throat and snake bite [3]. Flowers are astringent, tonic, diuretic, anticonvulsant, anti-inflammatory, antiulcer, hepatoprotective, and are useful in diarrhea, leprosy, skin diseases, gout, thirst, burning sensation, and thirst [24]. Leaf is spasmolytic; flower possesses antifertility action, gum is astringent, useful in diarrhea and dysentery; Decoction of flowers is given twice daily for 15 days to treat diarrhea [16]. Gum is given orally in a

dose of 1 gm for 2-3 times daily for 1-2 days in case of inflammation of liver. Leaves are astringent and tonic [16]. Root is used to treat night blindness, elephantiasis, impotency and snake bite. It also causes temporary sterility in women and is applied locally on piles, ulcers, tumors and dropsy. Seed of *B. monosperma* is used in inflammation, skin and eye diseases, bleeding piles, urinary stones, abdominal troubles, intestinal worms and tumor. When seeds are pounded with lemon juice and applied to the skin, they act as a Rubefacient [5, 8, 25]. Stem bark of this plant exhibits various pharmacological properties like, astringent, styptic, aphrodisiac, and anti-inflammatory [25]. *Butea monosperma* is useful as an indigenous medicine for the treatment of anorexia, dyspepsia, diarrhea, dysentery, hemorrhoids, intestinal worms, hepatopathy, ulcers, tumors, hydrocele and diabetes [5, 26]; Bark decoction is useful for cold, cough and catarrh. Its various parts exhibit diverse range of medicinal properties [5].

#### Research Studies

##### Anti-inflammatory activity

In *in vitro* study anti-inflammatory mechanism of a hydroethanolic extract of *B. monosperma* flowers (BME) and more specifically of an enriched fraction in butrin and isobutrin (BI) was studied using cell culture of Normal Human Keratinocyte, cells involved in the skin inflammation. Results obtained revealed that hydroalcoholic *B. monosperma* flower extract was able to decrease the secretion of IL-1 $\beta$ , IL-6 and IL-8 pro-inflammatory cytokines of -32, -33 and -18% respectively. Prostaglandin E2 production and the secretion of MMP-1, -2, -9 and -10 were also inhibited. Same results were observed in presence of enriched fraction in butrin and isobutrin and confirmed the involvement of these molecules in the anti-inflammatory activity of *Butea monosperma* [27]. A case study by Ansari *et al.*, 2019 reported that Hot and moist fomentation with *Gul-i-Tesu* (*Butea* flower) with oral use of *Habb Suranjān* is found effective in joints pain and knee osteoarthritis without any side effect [28]. Another study conducted (Ansari *et al.*, 2017) to evaluate chondroprotective effect of hydromethanolic extract of *Butea monosperma* (Lam.) flowers (BME) standardized to the concentration of Butein on human Osteo Arthritis (OA) chondrocytes stimulated with IL-1 $\beta$  reported that hydromethanolic extract of *Butea monosperma* (Lam.) flowers (BME) has strong potential to activate autophagy and suppress IL-1 $\beta$  induced expression of IL-6 and MMP-3, -9 and -13 in human OA chondrocytes [29].



### Antidiarrheal and antimicrobial activity

The ethanolic extract of stem bark of *B. monosperma* has been evaluated for its antidiarrheal potential in Wistar albino rats. The extract inhibited castor oil induced diarrhea and PGE2 induced enteropooling in rats; it also reduced gastrointestinal motility after charcoal meal administration. The results observed establish the efficacy and substantiate the use of this herbal remedy as a non-specific treatment for diarrhea [30]. Methanol soluble fraction of the flowers of *B. monosperma* showed antimicrobial activity against various fungal species due to presence of a bioactive flavone glycoside [31]. In another *in vitro* study antimicrobial efficiency of seed oil of *B. monosperma* was studied by the filter paper disk method against several human pathogenic bacteria and fungi. The oil showed a significant bactericidal and fungicidal effect [32].

The petroleum and ethyl acetate extracts of the stem bark from *B. monosperma* displayed antifungal activity against *Cladosporium cladosporioides* and the antifungal activity of stem bark extracts was found to be greater than that of Benlate (standard fungicide) [33,34]. Another study (Sharma *et al.*, 2019) revealed antibacterial and antidiarrheal effect of Aqueous extract of *B. monosperma* bark (BMAqE) against newly isolated gram negative pathogenic bacterial strain *Enterobacter cloacae* and castor oil induced diarrhea in albino rats using bacterial growth kinetic study, fluorescence spectroscopy, outer and inner membrane permeability assay, dehydrogenase inhibitory assay and protein leakage assay followed by field emission scanning electron microscope (FE-SEM) study and followed by histopathology studies of rat ileum. These effects are found due to active phytoconstituents mostly flavonoids and polyphenols present in the bark of *Butea monosperma* [35].

Pippali rasayana, an Ayurvedic herbal medicine, prepared from *Piper longum* and *B. monosperma*, prescribed for the treatment of chronic dysentery and worm infestations was tested for anti-giardial and immunostimulatory activity in mice, infected with *Giardia lamblia* trophozoites. It produced up to 98% recovery from the infection, Enhancement of host resistance could be one of the possible mechanisms contributing towards the recovery of animals from the Giardial infection [36].

### Anthelmintic activity:

Iqbal *et al.*, reported that seeds of *B. monosperma* administered as crude powder at doses of 1, 2 and 3 g/kg to sheep naturally infected with mixed species of

gastrointestinal nematodes exhibited a dose and a time-dependent anthelmintic effect. The maximum reduction of 78.4% in eggs per gram of feces (EPG) was recorded on day 10 after treatment with 3 g/kg whereas Levamisole (7.5 mg/kg), a standard anthelmintic agent, exhibited 99.1% reduction in EPG [37]. Another study (Prashanth *et al.*, 2001) reported that methanol extract of *B. monosperma* seeds, tested *in vitro*, showed significant anthelmintic activity [38].

### Hepatoprotective Activity

A study conducted by Ahmad *et al.*, reported hepatoprotective effect of flower of *Butea monosperma* (BM) in Paracetamol induced hepato-toxicity in rabbits. Oral administration of BM flowers powder (100 mg/kg) effectively inhibited paracetamol induced changes in the serum marker enzymes, Aspartate Transaminase (AST), Alanine Transaminase (ALT) and Alkaline Phosphatase (ALP) [13].

Another study conducted (Sehrawat *et al.*, 2006) on Wistar rats also revealed that the methanolic extract of *Butea monosperma* (BM) possesses hepatoprotective effects. The alcoholic extract of BM used in the study seemed to offer dose-dependent protection and maintained the structural integrity of hepatic cells and also it might suppress the promotion stage via inhibition of oxidative stress and poly-amine biosynthetic pathway [39]. Butein is an important ingredient of the flower extract of *Butea monosperma* which contributes towards its free radical scavenging, antioxidant and anti-apoptotic properties. The Butein content of *B. monosperma* preparations seems to be crucial for its beneficial effects against hepatic disorders [40]. Butrin and Isobutrin are responsible for hepatoprotective effect of flower of *B. monosperma* [41].

### Chemopreventive activity

The chemopreventive effect of *B. monosperma* extract was studied on hepatic carcinogenesis and on tumor promoter induced markers and oxidative stress in male Wistar rats. Treatment of male Wistar rats for five consecutive days with 2-AAF i.p. induced significant hepatic toxicity, oxidative stress and hyperproliferation. Pretreatment of *B. monosperma* extract (100 and 200 mg/kg body weight) prevented oxidative stress by restoring the levels of antioxidant enzymes and also prevented toxicity at both doses [42].

Chemopreventive effects of the aqueous and methanolic extracts of *B. monosperma* in rodent models of hepatic injury and hepatocellular carcinoma as well as flavonoid and triterpenes are found active against different strains

of bacteria as well as many human cancer cell lines as reported by Choedon *et al.*, 2010 [43] and Sharma and Shukla, 2011 [44]. Another *in vitro* study reported anticancer action of flower extract of *Butea monosperma* on human breast cancer cell line [45].

#### **Antihyperglycemic activity**

A study reported that Ethanol extract of the flowers at a dose of 200 mg/kg exhibited significant reductions in blood glucose, serum cholesterol and improved glucose tolerance, high density lipoprotein (HDL)-cholesterol and albumin levels in alloxan-induced diabetic rats. Single dose treatment of ethanolic extract of *B. monosperma* (200 mg/kg, p.o.) significantly improved glucose tolerance and caused reduction in blood glucose level in alloxan-induced diabetic rats. Repeated oral treatment with ethanolic extract of *B. monosperma* (200 mg/kg/day) for 2 weeks significantly reduced blood glucose, serum cholesterol and improved HDL cholesterol and albumin as compared to diabetic control group [46]. In a study conducted by Deore *et al.*, (2007) has reported that the crude aqueous extracts of the *Butea* bark exhibited significant hypoglycemic and antihyperglycemic effects in normal and alloxan-induced diabetic albino rats, respectively [47]. Study conducted by Bavarva *et al.* (2008) reported that oral administration of the ethanol extract of the seeds exhibited significant antidiabetic effect in noninsulin dependent diabetes mellitus (NIDDM) rats [48]. But another study conducted by Ahmed *et al.*, (2012) to evaluate the antidiabetic effect of aqueous extracts of *B. monosperma* leaves and bark in streptozotocin-induced severely diabetic rats and reported that both leaf and bark extracts of *B. m monosperma* produced insignificant antihyperglycemic activity. The leaf and bark extracts reduced blood glucose to an extent of 28% and 11%, respectively and did not improve pancreatic architecture as reflected by the histopathologic studies [49].

#### **Anticonvulsant activity**

The ethanolic extracts of leaves of *Albizia lebeck* and flowers of *Hibiscus rosa sinesis* and the petroleum ether extract of flowers of *Butea monosperma* studied foanticonvulsant activity. The bioassay guided fractionation indicated that the anticonvulsant activity lies in the methanolic fraction of chloroform soluble part of ethanolic extract of the leaves of *A. lebeck*, acetone soluble part of ethanolic extract of *H. rosa sinesis* flowers and acetone soluble part of petroleum ether extract of *B. monosperma* flowers. The fractions protected animals from maximum electro shock, electrical kindling and pentylenetetrazole-induced convulsions in mice. The fractions also inhibited

convulsions induced by lithium-pilocarpine and electrical kindling but failed to protect animals from strychnine-induced convulsions. The fractions raised brain contents of gamma-aminobutyric acid (GABA) and serotonin. These fractions were found to be anxiogenic and general depressant of central nervous system [50]. In another study, the anticonvulsant activity of the crude methanol stem extract of *Butea monosperma* and its bioactive compound has been reported in Swiss albino mice using the Maximal electroshock (MES) convulsion and the Pentylenetetrazole (PTZ) induced convulsion models. The study also suggested its use in the treatment of epilepsy [51]. As per another study, it shows anticonvulsive activity due to the presence of a triterpene [52].

#### **CONCLUSION**

From the above review it can be concluded that *Dhāk* (*Butea monosperma*) is an important and useful drug. It has variety of actions and used as a single entity or with other drugs in compound formulation in various ailments. As per Unani literature, each part of the plant has its own temperament and action and used to treat various diseases. It is effective in backache, flatulence, diarrhea, premature ejaculation, haemorrhoids, helminthiasis, vaginal discharge, gonorrhoea, ammenorrhoea, dysuria, anuria, cystitis, orchitis, oophoritis, joint's pain, brain disorder and skin diseases as a single drug or in combination. It balances humours and removes morbid matter from the body and promotes health especially its gum in promotion of women's health. Its anticancer, antitumor, anticancer and chemopreventive activities suggest that it can be used in the treatment of carcinoma without destroying normal healthy cells. Due to its proven anti-inflammatory, antimicrobial, hepatoprotective, antioxidant, antidiarrheal activity, it can be used in arthritis, diarrhea and hepatic diseases. It has several bioactive secondary metabolites which are responsible for its various actions. There is a need to explore its more actions through animal studies. The validated claims in animal studies may be further authenticated by clinical trials to confirm it. Central Council of Unani Medicine has done the standardization of its flower and seed which may help in identification genuine medicinal plant and to prevent adulteration. As Unani system has holistic approach and whole body is treated as a unit whole plant or its part is used in natural/crude form because body can digest, metabolize and retain natural ingredients easily and the drug cures disease without producing adverse effects. Moreover, plants are storehouse of molecules that act as

lead structures for new drug development and none other new drug discovery approaches can replace the importance of plants in this direction.

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## THERAPEUTIC APPLICATION OF TANKAR (BORAX) ACCORDING TO UNANI SYSTEM OF MEDICINE: A REVIEW

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### ABSTRACT

Borax is a mineral origin drug belongs to traditional system of medicine. It is a color less, translucent monoclinic crystalline with irregular shape. Chemically it is composition of boric acid and sodium. Its important component is Boron. It is also called as Sodium baborate. Borax contains 11.3% boron. Turkey is the largest source of borax about 73% of world. Vegetables, Fruits and salts are the main source of boron. Borax is used as a medicine because of its various therapeutic purposes such as Antimicrobial, Anticancer, Osteogenesis, Genotoxic, Vermicidal, Hemostatic, Analgesic and Healing properties. The information about this drug was extracted from traditional, modern drugs and electronic resources. Borax naturally present in crude form known as "sohagroo or tinkala". After purification sohagroo called as Tankar (borax) and used for multiple therapeutic purposes. Borax is pentahydrate with specific gravity 1.73 having wide range of actions in Unani System of Medicine (USM) such as *Jali* (Cleanser/Detergent), *Daf-e-taaffun* (Antiseptic), *Hazim* (Digestive), *qatil-e-Jaraseem* (Insecticides), Akkal (Corrosive), *Munaffis-e-balgham* (Expectorant), *Mudir-e-hydz* (Emmenagogue), *Mudir-e-bowl* (Diuretic), *Kasir-i-Riyah* (Carminative) and *Daf-e-samoom* (Antidot). Traditionally used orally in the treatment of acidity, amenorrhea, dysmenorrhea, menorrhagia, puerperal convulsions (PIH). Locally beneficial for ulcers, piles, cystitis, leucorrhea, gonorrhoea, cervical erosion also treat skin disease such as ringworm, acne, Pityriasis and melasma. Borax has temperament hot<sup>3</sup> and dry<sup>3</sup> temperament.

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**Keywords:** Antimicrobia, Genotoxic, Mineral origin, Temperament, Unani System of Medicine.

### INTRODUCTION

Borax (Sodium borate, Na<sub>2</sub>B<sub>4</sub>O<sub>7</sub>) is one of the valuable naturally occurring mineral, which is used traditionally in Unani system of medicine because of its medicinal values or properties. Widespread in nature, in earth crust its concentration about 10 ppm and in seawater. 4.6 pmm.<sup>1</sup> It can be obtained from seasonal lakes after repeated large quantities of evaporation.<sup>2,3</sup> Chemically it is composition of boric acid and sodium. It is a salt of Boric acid that is an important component of Boron. It is also called as Sodium baborate. It is essential element for our body so, necessary to consumed daily in food. Borax contains 11.3% boron. Vegetables, Fruits and salts are the main source of boron, in vegetable boron is found at highest level. Plants (0.1 to 0.6 mg borax/100 g) have higher level of borax than animal food (0.01 to 0.06 mg/100g).<sup>1</sup> Turkey is the largest source of borax about

73% of world.<sup>4,5</sup> Borax is pentahydrate having wide range of actions in Unani System of Medicine (USM) such as *Jali* (Cleanser/Detergent), *Daf-e-taaffun* (Antiseptic), *Hazim* (Digestive), *qatil-e-Jaraseem* (Insecticides), Akkal (Corrosive), *Munaffis-e-balgham* (Expectorant), *Mudir-e-hydz* (Emmenagogue), *Mudir-e-bowl* (Diuretic), *Kasir-i-Riyah* (Carminative) and *Daf-e-samoom* (Antidot). Hence it can be used internally as well as externally in different form dependents on diseases.<sup>6,7,8,9</sup> In Unani system of medicine Borax is of two type 1) Mineral (Natural) and 2) Non Mineral (Artificial).<sup>9</sup> In India mineral type is founded in Nepal and Tibet. Artificially it made of Bora-i-Armani and Namak-e-sahji (Sodium Cabonate).<sup>9</sup> Originally found in the form of crystalline translucent irregular tough masses. Present on shores and mud of lakes surrounded by hills of this state is known as crude. This crude form of

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Tankar known as “sohagroo or tinkala”. After purification sohagroo is called as borax (*Tankar*). It is composition of boric acid and soda and became opaque after exposure to air. Another one is greenish-white known as Telio or tankana. They are small pieces, smooth, translucent six-sided prisms also became opaque and dirty white in color after air exposure.<sup>3</sup> Tankar used after purification by different methods according to their uses such as internal and external. For external use: sohagroo dissolved in 24 parts of water and filter it then after get heated till it dried completely. For internal use: make fine powder of sohagroo heated at low flame in iron vessels till then it became *kheel* then after cool it and done fine powder and used internally single or in formulations.<sup>10</sup>

#### Common Vernacular Name

**Arab:** Buraekes-saghah, **English:** Sodium Biborate; Sodium Borate; Biborate of soda; Borax; Biborate of Sodium; Tetraborate Sodium, **Gujrathi:** Tankan-khar; Kuddiar-khar, **Hindi:** Tinkal; Tincal; Sohaga, Khariloon, **Punjabi:** Sohaga, **Persian:** Tinkar; Tankar, **Sansanskrit:** Tankana; Tunkana; Rasashodhan.<sup>3</sup>

#### Purification of Borax

There various methods which is used to purify borax and then it is able to use for medicinal purposes. It can be purified by Raw Borax first powdered, then it take in hot iron pot & stirred till it intumesced this borax than make powder very fine and used for analysis. Also it can be purified by dissolving it in water, straining through cloth and then evaporating to dryness. Another method for purification is Raw Borax is taking in a clean and dry kharal and pounce well to prepare powder. This powder is take in to an earthen pot then it is heated on low flame followed by high flame, until all the water content in the Borax is completely evaporated. Finally Tankan is obtained as a white colored puffy light substance. After three time purification almost 50% of weight is reduced due to evaporation of water in the raw Tanaka.<sup>1</sup>

#### Morphological Characteristics

Borax (decahydrate) is one of best mineral origin drug. It is used for various medicinal purposes due to some special characteristics. It has a specific gravity of 1.73. It is soluble in cold water (47.1 g/L at 20 °C) and in hot water and insoluble in acids and ethanol. It is a color less, translucent monoclinic crystalline with irregular shape. It readily effloresces. On heated at 320 °C or above it loses all water and become *Kheel*. This is slightly soluble in methanol.<sup>11</sup>

#### Properties of Borax:<sup>12</sup>

IUPAC name	Sodium Tetraborate Decahydrate
Molecular formula	Na <sub>2</sub> B <sub>4</sub> O <sub>7</sub> ·10H <sub>2</sub> O
Molar mass	381.38 g/mol
Appearance	White solid
Density	1.73g/cm <sup>3</sup>
Melting point	743 °C
Boiling point	1575 °C

**Source:** it occurs as a natural deposit. Crud borax is found in masses by evaporation of water, on shores of dried up lakes in India and Tibet, it is also obtain from the mud of lakes surrounded by hills in Nepal. In this crud state it is known as sohagroo or tinkala. When purified by dissolving it in water, straining through cloth, evaporating to dryness and crystallizing, it is called borax or *tankan khar*.<sup>3</sup>

**Characteristics:** it is composed of boric acid and soda. In the native state it exists as an impure saline in incrustation of a dirty white color. It exists as crystalline tough masses or in the form of translucent irregular masses. Exposed to the air it becomes opaque. Another variety known as telio tankana is an impure salt met with in small pieces or smooth, translucent six sided prism. The color is greyish white, on exposure it become opaque and dirty white. It has a faintly balsamic odour and testes like *papada khar*.<sup>3</sup> Properties (Actions): *Jali* (Cleanser/Detergent), *Daf-e-taaffun* (Antiseptic), *Hazim* (Digestive), *qatil-e-Jaraseem* (Insecticides), *Akkal* (Corrosive), *Munaffis-e-balgham* (Expectorant), *Mudir-e-hydz* (Emmenagogue), *Mudir-e-bowl* (Diuretic), *Kasir-i-Riyah* (Carminative) and *Daf-e-samoom* (Antidot).<sup>6,7,8,9</sup>

#### Traditional Medicinal uses

Borax can use internally and externally in different doses according to diseases. Internally in doses varies from 10-30 grains, in acidity, amenorrhoea, dysmenorrhoea, menorrhagia, puerperal convulsions (PIH) and increase uterine contraction during labour pains. As a solvent it is given in uric acid diathesis at dose of 20-40 grains for an adult. In fever used in the form of pills called as *Kaphaketu Rasa* (aconite). Borax and half of these take conch-shell make powder and soaked over three times in the juice of fresh ginger and made pills of two grains each is given with honey and ginger juice for all sorts of phlegmatic diseases such as common bronchitis and pneumonia. Borax is used at dose of 30 grains in the situation of prolonged and obstructed labor pains to expel out baby. It can also give in pre-eclampsia and eclampsia.

In case of abortion 10 grains with Konjee may give every one and two hours for 3 to 4 times. In irregular menstrual bleeding and chronic uterine infection 10 grain of borax with 10 grain of cinnamon are used. It acts betel juice 4 to 8 grains doses as preventive of ague. In small doses it is act as laxative, appetizer and used in painful dyspepsia, cough, asthma and obstinate cough. Also act as sedative in irritable conditions of the fauces and pharynx, chronic bronchitis, cystitis. It also used in foetid stools of diarrhea of children in summer. If diarrhea with spasmodic griping pains it is used with glycerin. Traditionally it is

used in convulsions of children at doses of 1 to 5 grains given with mother's milk according to the age of child. In adult it is used for bronchitis and asthma at dose of 5 grains of borax and 3 grains of pepper mixed with 1 tsp honey given thrice a day. Also used in children but dose depends on age of child for epilepsy continued for years in doses of 15 to 30 grains after meal. Borax (5 grain) eaten with betel leaves has been very effective in impotence also in de-obstruent in internal tumors of abdomen. Gastro-intestinal disturbance usually occurs at beginning then after resolve gradually.<sup>3</sup>

#### Indications of Borax:

S.No.	Pharmacological Action	Indications	Mode of Administration	Reference
1.	Mudirr-i-hayd (emmenagogue)	Amenorrhea, Dysmenorrhea, Oligomenorrhea,	Orally	1, 6,7,8,10
2.	Amraz-e-niswa	Amenorrhea, Dysmenorrhea, Menorrhagia, Puerperal convulsions (PIH), Pre-eclampsia, Eclampsia, Cystitis, Leucorrhea, Cervical erosion	Orally	1,3, 6,7,8,10
3.	Amraz-e-tanaffus (Respiratory diseases)	Chronic cough, Asthma	Orally	6,7,8,10
4.	Amraz-e-jild (Skin diseases)	Acne, Pityriasis, Ringworm, Melasma	Locally	6,7,8,9,10
5.	Amraz-e-meda wo ama	Splenomegaly, Acidity, Abdominal pain, Dyspepsia,	Orally	6,7,8,9,10
6.	Kasir-e-Riyah (Carminative)	Dyspepsia, Acidity	Orally	6,7,8,9,10
7.	Jaali (detergent)	Hyperpigmentation, Boil, Acne, kalaf, freckles, Mouth ulcers, Candidiasis, Vaginitis, Otorrhoea, Ringworm, Stomatitis	Locally	6,7,8,10
8.	Däfi'-i-Su'äl (antitussive)	Obstinate cough, acute and chronic Bronchitis, Asthma	Orally	6,7,8,10
9.	Mushtahé (appetizer), Däfi'-i-Warm-i-Jigar (hepatoprotective)	Acidity, appetizer, dyspepsia,	Orally	6,7,8,10
10.	Munaffis-e-balgham (expectorant)	Cough, acute and chronic Bronchitis Pneumonia, Asthma	Orally	6,7,8,10
11.	Akkal (corrosive)	Hemorrhoids	Locally	6,7,8,10
12.	Daf-e-taaffun (Anti Septic)	Chronic ulcers, Tongue fissure, Gingivitis, Otorrhoea, Gonorrhoea	Locally	6,7,8,10
13.	Daf-e-samoom (Antidot)	Snake bite,	Orally	6,7,8,10

#### Temperament:

Temperament is one of the unique features of USM. It is used for treatment, diagnosis and prevention of diseases. Borax having *Dry*<sup>3</sup> and *Hot*<sup>3</sup> temperament.<sup>7,8,10</sup>

**Dosage:** 500 mg.<sup>13</sup>

**Adverse effect:** As per Unani literature this drug may adversely effect on Stomach (vomiting and diarrhea).<sup>6,9</sup>

**Corrective:** Kateera (*Cocchlospermum religiosum* Linn), Gond-e-babul (*Vachellia nilotica*).<sup>6,9</sup>

**Substitute:** Bora-i-Armani.<sup>13</sup>

**Active constituents:** Boric acid, Sodium Carbonate.<sup>13</sup>

Mashoor murrakkab: Habb-e-Tinkar, Habb-e-Kabid Naushadri, Sufoof-e-Chutki, Habb-e-Tihal.<sup>13</sup>

### Therapeutic Applications:

#### Osteogenesis:

Borax is one of the best drugs used traditionally for growth and development of bone. It plays an important role in regeneration of bone and osteogenesis.<sup>14</sup>

#### Hormonal changes:

There are various studies revealed that oral use of Borax produces similar effect like estrogen in postmenopausal women having osteoporosis. In males taking 10 mg/day for 7days significantly decreases in sex hormone and increase testosterone level in blood plasma.<sup>15</sup>

#### Antimicrobial Action:

Various research studies revealed antibacterial and antifungal action of borax specifically against bacterial strains such as *E. coli*, *P. aeruginosa*, *S. aureus*, *S. pyogenes* and fungal strains *C. albicans*, *A. clavatus* and *A. niger*.<sup>16</sup>

#### Anticancer Action:

Certain studies have showed that boron has anti-carcinogenic properties. In regions where people take Boron rich diets, soil and water having lower risk of several types of cancer such as breast, cervical and lung cancers. Borax intervenes in the life cycle of HPV and HPV-16 and HPV-18 cause approximately 95% of all cervical cancers. Boron exists in the human body mostly in the form of boric acid, act as serine protease inhibitors reduce the immortalizing and transforming capacity of the HPV E7 oncogene.<sup>17</sup>

#### Genotoxic Action:

In Preclinical study by Gulsoy N et al on Zebrafish showed that DNA strand breakage induced by boric acid and borax, regardless of dose and time depend, could be detected by the Comet assay in fish in the aquatic environment, especially near the boron rich areas. Therefore genotoxic effect of these compounds should be investigated by the field and the laboratory controlled experiments. Most of the studies reported that boron compounds were found to be non-genotoxic and even boron had antioxidant effects on various human cell lines

in vitro and rat tissues by Türkez et al., 2007, 2010, 2012a,b, 2013; Türkez, 2008; Geyikoğlu and Türkez, 2008; Ince et al., 2014; Üstündağ et al., 2014. Some studies showed that borax has protector agent for metals or drugs induced genotoxicity in vitro.<sup>18</sup>

#### Anti-inflammatory Action:

There are various study showed anti-inflammatory property by suppression of level of inflammatory biomarkers (interleukin-8).<sup>19</sup>

#### Wound healing:

Application of 3% boric acid solution to deep wounds improve wound healing capacity.<sup>20</sup>

#### Toxic Action:

There is various studies revealed that 17.5 mg boron/kg per day affected fertility rate in rats. In human may cause nausea, vomiting, diarrhea and lethargy.<sup>21</sup>

#### Field study:

A field study conducted by Saleem M is proved that Borax application improved all the agronomic growth parameters such as height, number of grains, Weight, growth of plant. It is significantly increased the yield of rice crop under flooded condition.<sup>22</sup> Moreover study conducted by Ali I et al investigated that borax-modified starch (BMS) provide significantly improved strength properties, reduction in softwood pulp costs, and better papermaking machine performance. Results clearly suggest that the overall tensile properties show a significant increase while other properties are not negatively affected.<sup>23</sup>

#### Commercial uses:

Borax used in many process such as metallurgical processing of steel, non-ferrous and amorphous metals, welding fluxes, and plating compounds as well as in ceramics, laundry detergent boosters, food additive, cleaners, preservatives, dispersal agents, filler in composite materials, shielding material in nuclear applications due to its high ability for adsorption of nuclear emissions, cross linking additive in the processing of biomaterials and corrosion resistance coatings. Anhydrous borax is used for the preparation of sodium borohydride. It is an important hydrogen storage material, and also for the boron recovery. The production of borax from new raw materials is important, due large commercial uses and very less resources, particularly from waste materials by facile process. Nowadays it is used for removal of various organic and inorganic contaminants such as Cr and 2,4-dichlorophenol from waters also used for the synthesis of Fe nanoparticles.<sup>24-34</sup>

Dilute solution of borax used for cameraless photochemical photography. Steam injection of borax is one of the well-known thermal recovery processes that have been extensively applied to heavy oil reservoirs.<sup>12,35</sup>

Borax can be used for formation of ceramic, glass, cement, metallurgy and imitations of precious stones etc hence boron-based products is continuously increased.<sup>35</sup>

Borax is economically friendly therefore its waste can be assessing in the roof tile and brick in which 10 % concentrator wastes (TCM5 and BCM5) at 960 C gave the most satisfactory result in terms of firing strength. The addition of Borax is good factor for flame protection of the composite also enhances fire retardant.<sup>5,37</sup> Borax is used for the assaying of ores. It is the fusible to metals, and is particularly useful when small particles of metal mixed with dirt and ashes. They also facilitate the soldering of metals. Small amounts are used in sealing and optical glasses, Vycor, and vitrifying nuclear waste. Borax is used to produce a heat-resistant borosilicate glass for the home and laboratory. Borax can contribute to the softening of hard water by tying up calcium ions, as well as acting as a buffer agent. Borates are used extensively as fire retardants. Borax is necessary in small amounts for plant growth. It is one of the 16 essential nutrients and can be applied either to the soil or to the foliage. An adequate supply of boron is essential for proper seed set and normal fruit development. Its absence in a soil can cause vulnerability to disease and low yield in a crop also has Insecticide effect. Borax extensively used as a polishing agent.<sup>36</sup>

**Conflict of interest:** Nil

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## USE OF UNANI MEDICINE AS A POTENT ALTERNATIVE IN ORAL HEALTH PROMOTION: A NARRATIVE REVIEW

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### ABSTRACT

**Background:** Oral diseases are one of the most serious public health issues and the most common chronic diseases afflicting humanity. Despite the abundance of new medicines and technologies for coping with them, an increasing number of patients are searching for simpler, milder therapies to improve their quality of life and minimize iatrogenic complications. Unani herbal regimens, diets, and medications, as described in Unani literature, have been shown to be safe and effective in maintaining oral health.

**Aim of the study:** The aim of this study is to look into and identify significant traditional Unani oral hygiene maintaining methods, as well as how they relate to today's oral hygiene preservation arsenal.

**Materials and Methods:** Information regarding oral health-promoting practices was taken from published materials, ancient and modern recorded classical scripts, Unani pharmacopeias, and databases such as Pub Med, Web of Science, Science Direct, and Google Scholar.

**Results:** Unani medicine has a huge description of various medical herbs with antibacterial and antimicrobial properties, according to ancestral medicinal books and healers with the current scientific shreds of evidence. Several experimental researches has confirmed that these medicinal herbs have antibacterial, anti-infective, antimicrobial, and antiplaque properties, suggesting that they could be useful as a complementary treatment for periodontal diseases or as oral health promoters. However, there is still a scarcity of studies to back up their use and effectiveness.

**Conclusion:** It is critical to scientifically demonstrate the underlying benefits of Unani medicine, as well as to elucidate and prove their potential therapeutic uses, for the sake of promoting oral health. We discovered papers that support or refute their traditional use and we conclude that medicinal plants use to treat oral conditions or add to the dental pharmacological arsenal should be relied on scientific investigations that confirm their suitability for orodental treatments.

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References: 44

**Keywords:** Unani Medicine, Anti-inflammatory, Oral health, Oral diseases.

### INTRODUCTION

Oral health is a leading indicator of general health, quality of life, and well being. Numerous systemic disorders have been linked to poor dental health. The

oral cavity site is a crucial portal of entry, origin, and venue for numerous disorders that impact health status. Oral health is integral to well-being and living standards, which are measured across the various functional,

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psychological, and economic aspects. Dietary habits, food hygiene, sleep, psychological effects, social connection, school, and workplace are all affected by poor craniofacial health. As a result, maintaining oral health is necessary to factor for the sustenance of a healthy life.<sup>1</sup> Oral diseases are a serious health burden in many nations, and they impact people throughout their lives, resulting in pain, irritation, disability, and even death. Oral disorders affect about 3.5 billion people globally, according to the Global Burden of Disease Study 2019 with caries of permanent teeth being one of the most frequent conditions.<sup>2</sup> Caries of permanent teeth affects an estimated 2 billion individuals worldwide, while caries of primary teeth affects 520 million children. The International Agency for Research on Cancer reported that the Lip and oral cavity cancers are among the top 20 most prevalent malignancies worldwide causing approximately 180 000 deaths annually. Oral diseases are becoming more common in most of the low- and middle-income nations as urbanization and living situations change. This is due to a lack of fluoride exposure (in water supply or toothpaste with no fluoride content), the availability and accessibility of high-sugar foods, and low community access to oral health care services. High Sugar consumption, cigarette use, alcohol intake, and poor cleanliness, as well as their underlying commercial and social determinants, are all modifiable factors for oral diseases. Dental caries and periodontal diseases are among the most serious global oral health issues, but other disorders such as oral and pharyngeal malignancies, as well as oral tissue lesions, are also major concerns.<sup>2</sup> The most prominent factors determining the prevalence of numerous oral diseases include inappropriate diet, smoking, alcohol consumption, and poor oral hygiene practices. The emphasis on a correct diet could be the arousing factor in maintaining proper oral hygiene as an improper diet can result in dental caries, dental degradation, periodontitis, cancer of the oral cavity, and a variety of soft tissues related disorders of the oral cavity. Likewise, gingival and periodontal disease oral cancer, tooth discoloration, halitosis (bad breath), taste bud abnormalities, and difficulties in healing wounds after surgery have all been associated with smoking. Similarly, oral intake of alcohol can be found associated with Oral cancer, and other potentially malignant illnesses such as periodontitis, dental caries, gingivitis, and xerostomia. However, if oral hygiene is not maintained it can potentially cause periodontitis and dental issues which are further indirectly responsible for the formation of cardiac disease, cancer, and diabetes mellitus.<sup>3</sup>

Periodontal diseases could indeed have severe systemic repercussions to the blood-borne dispersion of pathogenic bacteria and is linked to diabetes and the other systemic diseases. Periodontitis may also be an early sign of diabetic pathogenesis because the prevalence of periodontitis in diabetics is double or even triple that of the non-diabetics. However, diabetes management becomes much more difficult for patients who have periodontal disease. Patients who have periodontitis and diabetes same time are at risk of developing complications from cardiovascular, retinopathic and renal diseases.<sup>4</sup> Recently, the occurrence of periodontal disease has been linked to bacterial origin in the neural tissue of Alzheimer's disease patients.<sup>5</sup> Treatment for oral health problems is costly, and it is rarely covered by health insurance (UHC). Despite the fact that a variety of chemical compounds are commercially accessible, they can affect the oral microbiota and cause unpleasant side effects like vomiting, diarrhoea, and tooth discoloration. Furthermore, standard Western medicine has already had relatively little success in the prevention and treatment of periodontal disease and other oral illnesses. As a result, the quest for available alternatives remains, with natural phytochemicals obtained from plants used in traditional medicine being considered excellent substitutes for synthetic compounds.<sup>6</sup>

The World Health Organization (WHO) has recognized the Unani System of Medicine (USM) as an alternative system to cater the health care needs of human population. Many authoritative texts on Unani medicine emerged from Central Asia, Egypt, India, Iraq, the Islamic Republic of Iran and Spain during the eighth to twentieth centuries.<sup>7</sup> Unani-tibb, commonly known as Yunani Medicine that has been identified by "Greek Medicine" and "medicine." Its origins can be traced back to Greek literature, which has provided a wealth of scientific contributions as well as being developed into an extensive medical discipline by the Arabs and Persians civilization. Unani Medicine has been designated Greco-Arab Medicine since that times.<sup>8</sup> Hippocrates (Father of Medicine), an illustrious scholar who established the principle of humours (akhlat), developed the Unani system of medicine. Blood (*dam*), phlegm (*balgham*), yellow bile (*safra*), and black bile (*sawda*) are the four humours that constitute the physical body and the subtle pneuma. Any abnormal humour predominance determines a person's features and the clinical aspects of a disease.<sup>9</sup> Unani medicine employs the approaches of health maintenance (*hifz-i-sihhat*) suboptimal health management (*tadabir abdān-i-ḍa'ifa*),

and disease prevention (*ḥifz mā taqaddum*) for prophylaxis.<sup>10</sup> Dietary patterns, lifestyle, and external and internal environmental factors are recognised as the primary cornerstone in Unani system of medicine for the maintenance of health. Health is a state of equilibrium in the temperament (*mizaj*), humours, functioning of organs (*quwā and afa'l*) and all bodily functions done properly.<sup>11</sup> The description of oral health mentioned in Unani system of medicine is very elaborative and primitive. Oral health has been defined as the integral part of the promotion and maintenance of health as per Unani ideology. The significance of oral health can be seen in the ancient literature that showed that the first known herbal therapy in the form of toothpaste was found in Egypt, where a papyrus dated more than 2000 years (4<sup>th</sup> century BC) witnessed the attention of oral hygiene related measures.<sup>12</sup> During ancient era, Hippocrates and Aristotle, described several methods, procedures, and practices for improving oro dental health such as the phases and timing of eruption during dentition, herbal remedies for caries and inflamed gums inflammation, extraction procedures, the distinct use of certain metal wires for blocking the displaced teeth.<sup>13</sup> In Unani medicine, oro-dental health is kept individualistic, depending on each person's constitutional features (*ajnas e ashra*) different modalities of treatment is provided.<sup>11</sup> The body constitution is classified based on the predominance of one or more of the four humours. The dominance humours in both the individual and external factors (*asbab e badia*) determines health care needs in Unani, including oral health.<sup>9</sup> A number of extensive list about the oral hygiene practices and measures have been advised by the Unani scholars. The first ever description of tooth decay, cavities and toothache has been found in the Sumerian clay tablet where it is written as "Legends of the worm" and extracted from the Euphrates valley around 5000 BC. Herein, Hippocrates was the first to advocate a dentifrice powder for the cleaning of the impurities from malodorous teeth (355 BC). Oral hygiene was also emphasized, as evidenced by the finding of gold-plated tooth picks from the Mesopotamian culture, indicating the importance of oral hygiene practises.<sup>14</sup>

In Unani doctrine the etiopathogenesis of oral diseases has been explained by different scholars. Tabri in his famous book *Almualijat-i-buqratiya* mentioned that dental Caries (*Taakkul Asnan*) has been associated with the localized devastation of the calcified tooth by the action of different microorganisms majorly due to infectious origin (*taa'ffun*).<sup>15</sup> Likewise, Odontalgia (*wajaul asnan*)

toothache is a kind of pain in the teeth and/or their supporting parts, caused by various types oro-dental diseases. Sometimes it may be sensory malfunctioning due to dystemperament of nerves (*sue'I mizaj asab*) (inflammation of hot or cold type).<sup>16</sup> Gingivitis (*Warme-Lissa*) has been described to an inflammatory condition of gums that emerge due to predominance any of the predominant humour (*Khilt e ghalib*). For instance inflammation can be due to *dam* or *safra* or *balgham* and accordingly disease prevails.<sup>16</sup> The chief factor responsible for bad breath also known as Halitosis (*Bakhr-ul-Fam*) explained by Rabban *al-Tabari* is the deposition of malodorous fluids (*rutoobat raddiya*) in the oral region for longer periods causing infection inside gums and teeth (*Afoonat-i-Lissa wa Asnān*), dystemperament (*Su-e-Mizaj Haar*) of the oral cavity, disposition of bilious and phlegmatic humours in the stomach, and Lung ulcers (*qurooh-e-Riya*).<sup>10</sup> Stomatitis (*qula*) are superficial ulcers lies on the mucous membrane (*Ghisha-i-mukhati*) can spread up to the extent of oesophagus and stomach. Galen referred Deep ulcers (*quruh e khabisa*) that arise due to inflammation (particularly of *dam* or *safra*) in the oral cavity.<sup>16</sup>

The botanicals described in the Unani texts have been found to be safe and efficacious through the historical use. The study of medicinal plants used in traditional medicine could lead to the development of new oral health preventive and treatment procedures. Because the majority of oral disorders are caused by bacterial infections, medicinal herbs have been shown to have significant antibacterial activity against a variety of pathogens, including those that cause tooth caries. This study outlines and defines the several sorts of herbal-based dental and oral treatments that are routinely utilized in Unani medicine.

### Methodology

The information on oral health related articles were assessed using a bibliographic searching. The classical text mentioned in Unani literature (Urdu, persian and Arabic) were studied and analyzed properly. A detailed study of the Botanical herbs used in Unani system of medicine particularly for oral hygiene has been done. The English names of the medicinal plants was carefully done through reference book named *Indian Medicinal Plants* and other indexed journals. Books of contemporary origin, relevant articles, periodical, and indexed journals found on Pub Med, Science Direct, and Scopus were included for the study. The keywords "Unani Medicine", "Anti-inflammatory", "Oral health", "Oral diseases", and "anti-inflammatory" were utilized for the searching of the contents. The study did not include the articles in non English language, letter to editors, thesis and dissertations.

## RESULTS AND DISCUSSION

Through the implementation of oral health promoting interventions the prevalence of oral diseases various other non-communicable diseases could be reduced by dealing with the identified risk factors.<sup>2</sup> According to WHO, for the maintenance of oral health several initiatives have been advised and reported to prevent oral disease and recover oral health such as reducing sugary food exposure, using fluoridated toothpaste on a daily basis, and to use standardized (water) and fluoride based products. Contrary to the evidence presented above on the efficiency of healthcare in improving oral health, health promotion proposals are not widely implemented.<sup>17</sup> WHO recommended that the fluoride levels which are optimal can be obtained from various sources, including fluoridated potable water, salt, yoghurt, and toothpaste. Brushing teeth twice a day with fluoridated toothpaste (1000 to 1500 ppm) should indeed be encouraged. The concerning factor of oral health was stressed at the 74th World Health Assembly in 2021, when the World Health Assembly adopted a resolution on oral health. The Resolution advocates for a change shift from the conventional curative strategy toward a preventative paradigm that encompasses oral health promotion in the household, schools, and enterprises, and inclusion in primary health care. Oral hygiene should be firmly incorporated in the non-communicable disease initiative, according to the Resolution, and oral health-care measures should be included in universal health-care programmes.<sup>2</sup>

Similarly, Unani systems of medicine principle fundamentals idolize the concept of prevention rather than to cure. Unani scholars have advised a number of different lifestyle methods including the regimens (*tadābir*) and diet (*ghiza*) to maintain and preserve oral hygiene. Likewise, a number of single and compound formulations have been identified in Unani Medicine to promote good oral and general health.<sup>7</sup> For the management of oro-dental diseases Unani scholars have been advocated lifestyle improving procedures such as oral cleansing, excisions and extraction etc. Unani system recommends some daily using therapeutic regimens (*tadābir*) for the prevention and preservation of oral health. A wide range of the scientifically demonstrated favorable effects of these measures are described beneath:

**Use of Miswak (Toothbrushing):** The implementation of the usage of miswak has been seen the prehistoric Arabic period, where it was used to keep teeth white, sparkling and a ritual priority in oral hygienic practices. Najmul Ghani, an eminent Unani scholar mentioned in one of the famous book *Khazainul advia* that *miswak* act as the excellent oral

cleaning agent, prevent halitosis, strengthen teeth, and remove excessive deposition of abnormal fluids (*rutubat*). It has been described as one of the best drug for preventing oral diseases.<sup>18</sup> The most commonly used herb in Unani medicine for oral cleansing is peelu (*Salvadora persica*) belonging to family (Salvadoraceae). Several scientific studies has stressed the benefit of miswak in oral healthcare through a number of pharmacological actions such as anti bacterial, antifungal, anti-viral, anti-cariogenic, anti-plaque, antioxidant, analgesic and anti-inflammatory activities.<sup>1</sup> Unani system of medicine suggests chewing sticks in the morning and after each meal. The flavor of these herb sticks should be astringent, acrid, or bitter. The recommended technique of it to crush one side, chew it, and start chipping it. A well-known herbal chewing stick is neem (*Azadirachta indica*) that helps to prevent oro dental disorders if it is done consecutively for several days, cleans the oral cavity, prevent dental caries and other periodontal diseases.<sup>18</sup> Currently, a study about the antimicrobial effects of *Azadirachta indica* (Neem) and *Salvadora persica* (peelu) chewing sticks showed both the plants were effective on *streptococcus mutans* and *Streptococcus faecalis* demonstrated the anti-plaque and anticariogenic effect.<sup>19</sup> Miswak can also be done with fresh mulethi (*Glycyrrhiza glabra*) that cleanses oral cavity and prevent ulcers and stomatitis.<sup>18</sup> Likewise, Arjun (*Terminalia arjuna*) stems can be used to cleanse mouth and maintain oral hygiene. Chewing on these stems is thought to produce attrition and flattening of bitten surfaces, stimulate salivary release, and perhaps aid in plaque control, with some stems having antibacterial properties.<sup>18</sup> Rabban al-Tabari in his treatise of *Firdosul hikmat* mentioned about Sibr (*aloe vera*), although physiologically it is soft and gentle but act as an excellent miswak when rubbed over the teeth in curing halitosis due to the persistence of periodontal diseases and gingivitis.<sup>10</sup> In a single-blinded, randomized, crossover study, the effect of using miswak on the dental plaque, selected species of oral microbiota (*Streptococcus mutans* and *actinomyces comitans*) and gums inflammation was studied showed the improved scoring of Gingival index (GI), bleeding on probing (BOP) and plaque index (PI) thus promoting gingival health.<sup>20</sup> Furthermore in a study Gazi et al., studied effect of Miswak (immediate and medium-term) on the composition of saliva and reported it increases the calcium (22-fold), chloride (6-fold), and decreases phosphates and pH causing of remineralization of the tooth enamel.<sup>21</sup>

**Use of gargarah (Gargling)** involves the swishing of medicated herbs in the mouth, pharynx and oral cavity for oral and general health benefits. Gargling has been

used comprehensively as a traditional Unani remedy for thousands of years to prevent the decay, halitosis, bleeding gums, dryness of mouth, chapped lips and for strengthening gums, teeth and the jaw. It is usually done through the use of single Unani herbs or by the combinations of several herbs. Several herbs have been documented such as sibr (*Aloe vera*), gargle with mixture of vinegar and salt help in the cleaning of oral cavity and removal of plaque.<sup>22</sup> Ghani mentioned that the decoction of Arjun (*Terminalia arjuna*) help in strengthening of gums and teeth and thus prevent oral diseases.<sup>18</sup> A solution of *shibb e yamani* has been used as gargle in the treatment of stomatitis, bleeding gums (*lissa damia*), inflammation of gums and teeth and excellent remedial herb for excessive salivation (*kasrat e lu'ab*).<sup>23</sup> Rabban al-Tabari prescribed gargling mouth from a mixture made by powdered lahsun (*Allium sativum* L.), aqarqarha (*Anacyclus pyrethrum* DC) and kundur (*Boswellia serrata*) blended in vinegar prevents toothache and dental caries.<sup>10</sup> In vivo study of Mouthwash prepared for gargling from Pomegranate extract, Grape seed extract, and Guava extracts showed antibacterial efficacy on the salivary streptococci levels thus promoting oral health and hygiene.<sup>24</sup> Other studies examined the effect of sibr (*Aloe vera* L.) on oral cavity while gargling produces anti-inflammatory and antimicrobial action. Both the gel and the leaves suppressed the growth of *Streptococcus aureus* (18.0 and 4.0 mm). Only the gel reduced the growth of *Trichophyton mentagrophytes* (20.0 mm), while both *Pseudomonas aeruginosa* and *Candida albicans* were inhibited by the leaf. It was found to be beneficial in the treatment of gingival inflammatory condition and resulted in a reduction in plaque.<sup>25</sup>

**Use of Mazmaza (Mouth wash):** It involves the use of topical herbal medications by rinsing inside of the mouth to relieve in the multi-factorial oral conditions such as halitosis, oral ulcers, gingivitis, oral mucositis, periodontal disease, and even xerostomia. The herbs including Vinegar, arq mako (distillate of *Solanum nigrum* L.), arq kaddu (*Cucurbita pepo*), arq khayar tursh (*Cucumis sativus* L.) roghan gul (*Rosa damascena*) to relieve toothache and removal of morbid matter for the prevention of periodontal diseases.<sup>15</sup> However, the current evidences showed in a double-blinded, placebo-controlled interventional study, where herbal mouthwashes of aloe vera and tea tree oil were studied the plaque index, gingival index and salivary *Streptococcus mutans* counts and found decrease in plaque formation, gingivitis and *Streptococcus mutans* in the oral cavity region.<sup>26</sup> Similarly, Nair et al. reported a clinico-microbiological study of gilo (*Tinospora cordifolia*) decoction as mouth rinse demonstrated anti-

plaque, gingivitis, and antimicrobial activity against *Streptococcus*. Mutans identified using plaque and gingival index measurements.<sup>27</sup>

**Use of Sunoon (Toothpowder):** It is a type of dosage form made by fine powdering various herbs and particularly used in oral care. Sunoon -i-Balchhar (*Nardostachys jatamansi* DC) has been described to be effective in toothache and halitosis.<sup>23</sup> Another toothpowder prescription as a teeth cleanser, gums and teeth strengthener described in Unani texts is the use of Abhal (*Juniperus communis* L.), post beekh kibr (*Caparis spinosa*), tootiya (Copper sulphate), kaf darya (Cuttlefish bone), jaw sokhta (*Hordeum vulgare*), namak indarni (rock salt) each in equal quantities and utilized for oral healthcare.<sup>22</sup> Further, scientific evidences extracted in a single-blinded randomized clinical trial was carried out on the Unani toothpowder (pyorin) on the conditions of Plaque, gingivitis and external stain for 24 weeks. Results indicated gingival index, Plaque index, and Lobene index reported a decrease curve from baseline up to 24 weeks thus creating a positive effect on oral healthcare.<sup>28</sup>

**Use of Mazoog (Chewing herbs):** It is method in Unani medicine that employs the chewing and sucking of medicinal herb slowly in the mouth. A well known spice Darchini (*Cinnamomum verum*) when placed in mouth and chewed help in eradicating oral diseases.<sup>16</sup> Aneja et al., reported antimicrobial potential of cinnamon on dental caries related pathogens (such as *Streptococcus mutans*, *Staphylococcus aureus*, *Candida albicans*, *Lactobacillus acidophilus* and *Saccharomyces cerevisiae*) through agar well diffusion method and found zone of inhibition (29.30mm, 12.5mg/ml MIC) proving its antimicrobial effect thus preventing oral diseases.<sup>29</sup> Furthermore, the intake of Unani polyherbal preparation of Post turanj (*Citrus medica*), sumbul teeb (*Nardostachys jatamansi* DC), qaranfal (*Syzygium aromaticum* L.) joozbua, suk (concentrated extract of *Emblica officinalis* L.), ood (*Commiphora oppobalatum* L.), bisbasa (*Myristica fragrans* Houtt.), kebeba (*Zanthoxylum armatum* DC) (3.3gm each), mushk (*Moschus moschiferus* L.) (500 mg) prepared by powdering and mixing in cold water along gentle chewing and suckling should be done for promotion of aromatic odor in the oral cavity.<sup>22</sup>

**Use of Massage (dalak) on teeth:** Unani scholars elaborated the use of massage therapy for strengthening of weak and displaced teeth, gums strengthening, and removal of the infectious agents (ta'affuni ajsam) from the oral cavity for the promotion of oral hygiene. A polyherbal preparation prepared by using sumaq (*Rhus coriaria* L.), post anaar (rind of *Punica granatum*), halela zard (*Terminalia chebula*), gul surkh (*Rosa damascena* Mill), usarah amla (concentrated extract of

*Emblica officinalis* L.), baloot (*Quercus ilex* L.), gulnar (*Punica granatum*), mazoo (*Quercus infectoria*), zafran (*Crocus sativus* L.) and shabe yamani (alum) beneficial in curing periodontal diseases.<sup>22</sup> Abu Sahl Masihi, an eminent scholar in Kitab al mia't emphasized about the massaging of Roghan mastagi (oil of *Pistacia lentiscus* L.) on the gums and teeth for preventing glossitis and dental caries.<sup>30</sup> However, in a vivo study the effects of gingival massage in male wistar rats was investigated, where mechanical stimulation was given on the maxillary gingival molar region twice a week (5 seconds) for 4 weeks. Consequently, gingival hyperemia was measured through a laser Doppler flowmeter and morphological analyses by hematoxylin, eosin, Indian ink staining and a vascular resin cast model. Result indicated that in the mechanical stirred group, T1/2, total blood flow (Mass) and tooth revascularization was increased in rats suggesting enhancement in gingival microcirculation for maintaining oral health.<sup>31</sup>

### Lifestyle modification measures

Unani scholars have suggested avoiding certain kind of diet that putrefy in the stomach (such as milk combined with sikanjbeen (oxymel)), hard and viscous foods, sour diets (aghziya hamiza), anesthetic things (like ice), induction of emesis (*Qai'*), and intake of cold and hot foods together. For proper oral hygiene Unani Scholars stressed on using miswak daily along with sunoonand

gargle practices. For the detoxifying (*Istafragh*) of body from morbid matter (*akhlat-i- raddiya*) either from stomach or general disposition, a number of regimens including purgatives (*mushilat*) and venesection (*Fasd*) has been advised on the basis of deranged pathology (*mahiyat-i-marz*).<sup>22</sup>

### Pharmacotherapy for oral diseases

For the prevention and protection of oral health, Unani scholars have been promoted the use of Unani single and compound formulations in their principles for treatment (*Usool-i-ilaj*). Unani system of medicine advocates various herbs such as Haldi (*Curcuma longa*), Aqaqia (*Acacia nilotica*), Amla (*Emblica Officinalis* L.), Aqarqarha (*Anacyclus pyrethrum* DC), Anar (*Punica granatum* L.) Lehsun (*Allium sativum*), shabe yamani (alum), baloot (*Quercus ilex* L.), gul surkh (*Rosa damascena* Mill) etc. have been used extensively for oral diseases and found to have antiulcerogenic, anti-inflammatory, wound repair, antibacterial, antiviral, anti-plaque, anti-gingivitis and antioxidant activities. Some Unani polyherbal formulations such as Sunune Mulook, Sunune Zard, Sunune Mujalli, Majoon Suranjan, Habbe Gule Aak, Majoon Azaraqi etc have verified to be efficacious in the treatment of oral illnesses.<sup>8</sup> Table 1 shows the clinical significance of commonly used Unani herbs in the treatment of oral diseases.

**Table 1: Description of ethno-pharmacological prescriptions of Unani herbs in oral diseases with scientific evidences.**

S.No.	Oral diseases	Unani ethno-pharmacological prescriptions	Illustrated herbal Scientific action	References
1	Dental Caries	Filling dental caries with Aqar qarha ( <i>Anacyclus pyrethrum</i> ), Afyun ( <i>Papaver somniferum</i> L.) and Post-e-Kibr ( <i>Caparis spinosa</i> );  Mouthwash oral bacteria. ( <i>mazmza</i> ) with rose oil and vinegar;  Massage of gums and teeth with Gul surkh ( <i>Rosa damascena</i> Mill), Kundur ( <i>Boswellia serrata</i> Roxb), Maazo ( <i>Quercus infectoria</i> ), and Post-e-Anar ( <i>Punica granatum</i> );  To prevent dental caries use of mastagi, Alum, suk (an aromatic compound preparation of <i>Emblica officinalis</i> )	Anti-inflammatory, cytotoxic, antimicrobial activity and antibacterial effect against	10, 15, 32, 33, 34, 35, 36, 37, 38
2	Periodontal Disease	Hab e ayarij faiqra; Ingestion of tablets made by Post anar ( <i>Punica granatum</i> ), Gulnar	Astringent property, antibacterial, anti ulcer, anti inflammatory	1, 32, 38, 39

		( <i>Punica granatum</i> ), Mazoo ( <i>Quercus infectoria</i> ), Alum, Aaqar qarha ( <i>Anacyclus pyrethrum</i> ), Samaq ( <i>Rbus coriaria</i> L.), salt, fermented vinegar and Habbul Aas ( <i>Myristus communis</i> L.).		
3	Halitosis (bakhrul fam)	Istifrag of khilt e ghalib; Majoon Fanjnoos, Iyaraj Faiqra, Aaqar qarha ( <i>Anacyclus pyrethrum</i> ), Halela ( <i>Terminalia chebula</i> )	Pulpotomy Agents, antibacterial and Anti-inflammatory,	8,10,32,
4	Odentalgia (wajaul asnan)	Gargle with decoction Post-e-Anar ( <i>Punica granatum</i> ), and Samaq ( <i>Rbus coriaria</i> L.); Sunoon (Tooth powder) of aqarqarha ( <i>Anacyclus pyrethrum</i> ), dar e filfil ( <i>Piper nigrum</i> L.) shab yamani (Alum), halela zard ( <i>Terminalia chebula</i> )	Anti bacterial, anti hemorrhagic, astringent,	10, 38, 40, 41
5	Gingivitis (Warme-Lissa)	Venesection of basilica and cephalic vein (damvi type); Gargles from honey and olive oil; tooth powder of Suhaga biryan (Borax), mazoo sabz ( <i>Quercus infectoria</i> ), kebab chini (piper cubeba)	Antimicrobial activity, Antibacterial Activity (Gram-positive bacteria and Gram-negative bacteria)	10,16,42,43,
6	Stomatitis (qula-e-duhan)	Istifrag of abnormal humour (akhlat); Gargles from Leaves of Hina ( <i>Lawsonia inermis</i> ) and Kafoor ( <i>Cinnamomum camphora</i> )	Antiseptic, anti bacterial ( <i>Pseudomonas aeruginosa</i> ), anticancer	10,16,13, 14,44,45

## CONCLUSION

A sincere endeavor is made in this study to explore numerous plants with therapeutic properties that are described in the Unani system of medicine and can be used as an adjuvant in the maintaining of oral health. According to the Unani literature, there are numerous Unani single and multidrug formulations that can be used in the prevention and treatment of oral disorders. When evaluated using current scientific criteria, a variety of Unani plants reviewed in this manuscript demonstrated considerable analgesic, anti-inflammatory, anti fungal, anti-microbial, tissue regenerative, and antiulcerogenic properties. However, only a small percentage of medicinal plant extracts are employed in ordinary clinical oral treatment and the rest are avoided due to their uncertain toxicological consequences. As a result, multiple clinical trials are needed to assess the efficacy and toxicity of illustrated Unani herbs. Furthermore, steps should be taken to integrate ancient medicinal knowledge from systems such as Unani with modern dentistry practices. Incorporating the active elements of medicinal herbs into oral healthcare service is recommended in this case.

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## CONFLICTS OF INTEREST

There are no conflicts of interest.

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## PIVOTAL ROLE OF *HABB-I-GUL-I-AAKH* IN THE MANAGEMENT OF WAJA 'AL Zahr (LOW BACK PAIN): A REVIEW

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### ABSTRACT

In present era, *Waja'al Zahr* (Low back Pain) is the most common problem hindering patient to perform its daily life activities. LBP is currently one of the prime reasons for disability worldwide. The low back pain prevalence and estimate of the point prevalence range from 1.0% to 58.1% and the one-year prevalence of from 0.8% to 82.5% It is mostly prevalent in middle age group population. Individuals who suffer from low back pain may have a wide range of problems like physical, psychological, physiological and so on. People who have previously had low back pain episodes have increased risk of low back pain recurrence of the majority of the population with low back pain have low level of disability resulting in a very high societal burden. First description regarding *Waja 'al Zahr* in Unani System of Medicine (USM) was stated by Buqrat (Hippocrates). According to USM, accumulation of *Kham Madda* (raw morbid matter) in joint structures results in aberrant temperament (*Su 'i-Mijaz*) and its leads to *Waja'al Zahr*. In this review paper, authors tried to discuss about the concept of *Waja 'al Zahr* and its management in both USM and modern medicine.

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**Keywords:** *Waja 'al Zahr*, Unani Medicine, *Su'-i-Mijaz*, Low back pain, *Habb-i-Gul-i-Aakh*.

### INTRODUCTION

*Waja 'al Zahr* (low back pain (LBP) is the most prevalent musculoskeletal condition in developed nations. It is a commonest cause of disability. Almost every person has at least one episode of low back pain during their life. The LBP may be clinically present as acute and chronic pain. It is broadly represented as acute low back pain where the duration is less than one month, subacute from one to three month, and chronic if the duration is more than three month or if pain occur episodically within a six month period.<sup>1</sup> The LBP can arise from anterior structure-disc, muscle, ligaments, vertebral bodies; midline structures-spinal cord; posterior structure-ligaments, sacroiliac joint and facets and also by neural compression. Pain is produced by pressure on this structure from disc protrusion, osteophytes or trauma.<sup>2</sup> The LBP is the most common cause of disability in ages <45 years; LBP is the second most common cause of visiting a physician in the United States; ~1% of the United States population is disabled because of back pain.<sup>3</sup>

*Waja 'al Zahr* is described as a disease in which pain originates from internal and external muscles, ligaments surrounding the lumbar and lumbosacral regions. It is due to *Su'-i-Mizāj*, *Buroodat* and accumulation of raw *balgham* (phlegm).<sup>4</sup> It is not a definite disease; rather it is an indication that may arise from a variety of causes and many people are not diagnosed properly.<sup>5</sup> In USM, *Buqrat* (460 BC) was first who stated that if a *balghami mizaj* (phlegmatic temperament) develops numbness and coldness in his/her back and calf muscles reveals the chronic condition of disease.<sup>6</sup>

### Etiopathogenesis

- **Congenital:** Abnormal vertebral facets, sacralisation of L5 transverse process, spondylolysis or spondylolisthesis between L5 and S1 vertebrae.
- **Acquired Inflammatory:** Infective, osteomyelitis, e.g. tuberculosis, discitis, epidural abscess, non-infective or rheumatologic, spondyloarthropathies

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- (e.g. ankylosing spondylitis), trauma to ligaments, muscles, vertebrae or annulus fibrosus with disc prolapse.
- **Vascular:** Abdominal aortic aneurysm dissection, epidural haematoma, haemoglobinopathies
- **Neoplastic:** Primary tumours of the spine, e.g. multiple myeloma, metastatic
- **Degenerative:** Disc disease, facetarthropathy, spinal canal stenosis
- **Metabolic:** Osteoporotic vertebral fracture, Paget's disease
- **Minor trauma:** strain or sprain, whiplash injury<sup>3</sup>
- **Mechanical:** Poor posture aggravated by obesity, pregnancy, over work.
- **Referred Pain:** Abdominal viscera (renal, pancreas, posterior duodenal ulcer), pelvic disorders (pelvic inflammatory disease)
- **Other causes:** Soft tissue rheumatism, fibromyalgia, psychogenic/malingering, miscellaneous<sup>1</sup>

**Types of low back pain:**

Local pain	It is caused by stretching of structures that compress or irritate nerve endings (i.e. tears, stretching) located near the affected part of the back.
Pain referred to the back	It originates from the abdominal or pelvic region.
Pain of spine origin	Its cause stiffness in the back or may radiate to the lower limbs or buttock. Diseases of upper lumbar spine radiate to upper lumbar region, groin or anterior thighs. Diseases of lower lumbar spine refer pain to buttocks, posterior thighs, or rarely the calves or feet.
Radicular back pain	It causes radiation of pain from spine to leg in specific nerve root territory. For, e.g. coughing, sneezing, lifting heavy objects, or straining may evokes pain.
Pain associated with muscle spasm	It causes are diverse; accompanied by tense paraspinal muscles and abnormal posture.

Lumbar disc diseases are the commonest cause of low backache. It usually occurs at L4-L5 or L5-S1 levels.<sup>3</sup> At the age of 45 to 65 years, more than 70% people experience low back pain which inhibited them to perform daily activities. There is less association with gender regarding neck pain, although tobacco use is an associated risk factor. Physical work-related factors, such as heavy lifting, prolonged sitting and repetitive twisting, increases risk; prospective studies show that psychosocial issues, such as work as noninterest and job dissatisfaction, also are major predisposing factors.<sup>7</sup>

Spinal stenosis causes narrowing of spinal canal producing neurogenic claudication, which is characterized by induction of pain by walking in back, buttock, and/or leg and relieved by sitting. On the other hand, in vascular claudication, symptoms are provoked by standing without walking. Unlike lumbar disc disease, symptoms are relieved by sitting. Focal neurologic deficits common; severe neurologic deficits (paralysis, incontinence) are rare.

Low back strain or sprain used to describe as minor, self-limited injuries associated with trauma. Most common

cause of nontraumatic fracture is osteoporosis; others are osteomalacia, hyperparathyroidism, hyperthyroidism, multiple myeloma, or metastatic carcinoma.

In osteoarthritis (Spondylosis), back pain is influenced by spine movement and associated with stiffness. Increases with age, radiologic findings do not correspond with severity of pain. Osteophytes or combined disc-osteophytes may cause or contribute to central spinal canal stenosis, lateral recess stenosis, or neural foramina narrowing.<sup>3</sup>

The LBP can present as acute or chronic pain. Acute LBP is one where the duration is less than 1 month, subacute from 1 to 3 months, and chronic if the duration is more than 3 months or if pain occurs episodically within a 6 months period. Mechanical causes of low backache account for the majority (90%) of cases while systemic diseases account for only 10%. Acute LBP has a favourable natural history. Most episodes resolve in a few weeks. In one-third of patients, the LBP may last for a month. Chronic LBP of more than 3 months duration is seen only in a minority.

In USM, *Zakaria Razi* (865- 925 AD) described that *Waja' al-Mufāsil* cause lies in abnormal formation of Chyme (*Rutūbat-i-Mukhatia*) due to *Naqs* (defect) in *Hadm-i-Kabidi* and *Hadm-i-Urūqī*. *Rutūbat-i-Mukhatia* leads to production of abnormal humours, particularly abnormal phlegm. Other etiologies are trauma, disc prolapse and spinal abscess.<sup>8</sup> The pain may also arise due to accumulation of *Ghāliz Riyāh* in the lumbar and lumbosacral region.<sup>4</sup> *Ismail Jurjani* (d. 1140 A.D) explained causes of low backache are *Kasrat-i-Jima'*, *Masharikat-i-Reham*, *Du'fwa Laghari-i-Gurda* and excessive strenuous work.<sup>9</sup> *Ibne Hubal Baghdadi* (1163-1231 A.D) in his book *Al-Mukhtar-at-fit* defined LBP as *Pahlukadard*, caused by *Su'-i-Mizaj-Har*, *kasrat-e-Jama*, and also involvement of kidney.<sup>10</sup> According to *Najeebuddin Samarqandi* (13th Century AD), chronic *Waja 'al Zahr* is attributed to *Su'-i-Mizaj-Sada* and *Kham Bhalgham* and pain will disappear by walking and exercise.<sup>11</sup> *Akbar Arzani* (1721 A.D) described *Waja 'al Zahr* as *Dard-e-Pusht* and classified it into seven types, which was based on etiology of the disease. He further stated that *Waja 'al Zahr* is caused by *Su'-i-Mizaj Sada*, characterized by pain without heaviness and *Burudat*. This pain is relieved by *Hararat*.<sup>12</sup> *Hakim Ghulam Jeelani* (20th century) described different causative factors of *Waja 'al Zahr*, such as *Takan*, *Laghri*, excessive labour pain, etc. He stated that the main causes of *Waja 'al Zahr* is the *khambalgham*, which gets accumulated in joint spaces.<sup>13</sup>

In USM, according to *Avicenna*, *Waja* (pain) is defined as sudden perception of any uncooperative agent, which is not present in the natural states of a living body.

A perception of incompatibility in the body due to abrupt changes of temperament or *Su'-i -Mizaj-Mukhtalif* (variable impaired temperament) and *Tafarruq-i-Ittiṣal* (loss of continuity). The newly developed abnormal temperament becomes *Har* (hot) or *Barid* (cold) contrary to the natural temperament. The perception of such aberrant temperament is pain. According to *Jalinus* (Galen), *Tafarruq-i-Ittiṣal* is the actual cause of pain, for example cold produces pain through *Tafarruq-i-Ittiṣal* by shrinking and retracting the tissue.<sup>14</sup> *Waja 'al Zahr* is defined as a pain, which is perceived centrally and felt in the entire lower back region affecting daily life activities.<sup>15</sup> In *Tibb-i-Akbar*, *Akbar Arzani*, mentioned *Waja 'al Zahr* as *Dard-i-Pusht* caused by *Su'-i -Mizaj Barid Sada*.<sup>16</sup>

### Epidemiology

A study conducted in 2010 revealed that the global burden of the LBP was ranked 6 causing disability-related life years and ranked 1 overall for total years

lived with disability. From 1990 estimates, these numbers are increasing considerably. The number of LBP patients will increase significantly with the advent attributed to ageing of the population worldwide.<sup>17</sup> In 2017, the global burden of LBP prevalence was estimated to be about 7.5% of global population, or around 577.0 million people. It has been reported that lifetime prevalence of LBP in developed countries is up to 85%, which makes this complaint second only to the common cold.<sup>18</sup>

### Alamaat (Clinical features)

In USM, clinical features of *Waja 'al Zahr* are explained on the basis of causative factors:

#### In case of *Su'-i-Mizaj Barid Sada*:

- Feeling of coldness
- Pain without heaviness
- Pain relieved by hot regimens

#### In case of *Madda Balgham Kham*:

- Feeling of pain with heaviness in progressive manner
- History of eating cold temperamental foods

#### In case of *Riyah*

- *Waja Tamaddudi* (pain with tension)
- Migratory pain
- Feeling of slight heaviness
- Pain aggravates by taking those foods which produce flatulence
- Pain relieved by hot temperamental diets and oils

#### In case of *Hararat Sada*

- Presence of inflammation and local irritation
- Pigmented urine
- Hyperthermia
- Pain relieved by cold temperamental diets

#### In case of *Imtela-i-Rag*

- *Waja-e-Zarbani* felt along the course of *Rag* (vertically)
- Pain increases during movement
- Feeling of heat sensation locally

#### In case of *Zoaf-e-Gurda-wa-Laghari*

- *Zoaf-e-Bāh*
- *Dard-e-Qutn*
- Bladder symptoms<sup>9,16,19</sup>

### Management in USM

Unani physicians describe the treatment of *Waja 'al Zahr* is much similar with *Wajā-al-Mufāsil* (arthritis), *Wajā-ul-Warq* (coxalgia), *Hudba* and *Riyah-ul-Afarsa* (Kyphosis)). *Ilajis* mainly based on *ilaj-bil-dawa*

(pharmacotherapy), *ilaj-bil-ghiza* (Dietotherapy) and *Ilaj-bit-Tadbeer* (regimental therapy).

### **Ilaj-bil-Dawa(pharmacotherapy)**

Various Unani drugs like *habb-i-hudar*, *habb-i-asgand*, *habb-i-surjanjan*, *habb-i-asgand*, *Habb-i-Gul-i-Aakh*, *majoonsuranjan*, *iyarijfeeqrah*, *roghan-i-surkh*, *qurs-i-mufaasil*, *arq-i-ushbah*, *habb-i-mafaasil*, *majoonjograjgoogal*, etc. are employed in the management of *Waja'al Zahr*. *Habb-i-Gul-i-Aakh* is one of the famous polyherbal compound drug in the form of

pills, mentioned in National Formulary of Unani Medicine for the treatment of *Waja'al Zahr*. Most of the physicians have reported that it is an effective and safe drug for the treatment of *Wajā-al-Mufāsīl*. It is mainly used to treat the Inflammatory diseases both acute and chronic diseases, especially in case of joint and bone ailment, such as *Wajā-al-Mufāsīl*, *Naqris*(gout), *Wajā-al-Warik*(Hip joint osteoarthritis), etc. Unani scholars recommend *Habb-e-Gul-e-Aakh* and found that it possesses significant analgesic, anti-inflammatory and anti-arthritic activities.<sup>20</sup>

The ingredients of Unani formulation of *Habb-e- Gul-e-Aakh* as follows

S. No.	Ingredient name	Botanical name of ingredient and parts used
1.	<i>Gul-i-Aakh</i>	<i>Calotropisprocera</i> (flowers)
2.	<i>Barg-e-Bans</i>	<i>Bambusaarundinacea</i> (leaves)
3.	<i>Zanjabeel</i>	<i>Zingiberofficinalis</i> (Rhizome)
4.	<i>Filfisiyah</i>	<i>Piper nigrum</i> Linn (fruits)

The ingredients of *Habb-e-Gul-e-Aakh* will be taken in equal quantity and all will be grounded to fine powder and will be made pills of size 250 mg each.<sup>21</sup>

### **Scientific studies on *Habb-i-Gul-i-Aakh* standalone and its constituents**

- A study done by Ganga B, *et al.* showed that *Habb-i-Gul-i-Aakh* possesses significant anti-inflammatory property as it has revealed significant reduction ( $p < 0.01$ ) in paw oedema of test groups but less than standard. Also, it has analgesic activity as Writhing is decreased in test groups.<sup>27</sup>
- A study on standardization of *Habb-i-Gul-i-Aakh* done by Ahmad G, *et al.*, showed that it is an effective drug in the management of chronic arthritis.<sup>28</sup>
- Baig G, *et al.* study indicated that *Habb-i-Gul-i-Aakh* was safe and effective in the treatment of cervical Spondylosis.<sup>29</sup>
- A study evaluated that *Bambusaarundinacea* leaves, root, seeds and shoot are used as astringent, laxative, diuretics and its extract exhibits anti-inflammatory, antiulcer, antimicrobial and hypoglycemic activity.<sup>30</sup>
- An *in vivo* study conducted by Muniappan M and Sundararaj T demonstrated that extract of *Bambusaarundinacea* has an anti-inflammatory effect in immunologically-induced paw edema and it has also possesses anti-ulcer activity in albino rats.<sup>31</sup>

- A study done by HW Lem and AC Lee indicated that the *Zingiberofficinalis* not only reduce pain but also reduces functional disability in patients with non-specific low back pain.<sup>32</sup>
- Rohini Terry *et al.* study shows that the use of *Zingiberofficinalis* reduced the subjective pain.<sup>33</sup>
- A study done by Jun Soo Bang, Da Hee oh, and KyoungSoo Kim explained the anti-inflammatory and anti-arthritic effects of piperine in human interleukin stimulated fibroblast like synoviocytes and in rat arthritic models, respectively.<sup>34</sup>

### **Ilaj-bil-Ghiza(Dieto-therapy)**

- 1) *IbnSina* advised to take an easily digestible diet (*Ghiza-e-Jamiya*) in *Waja 'al Zahr*. According to him, *Hilyoonis* is the best diet in *Waja 'al Zahr*.
- 2) According to *Razi*, use of *Pudina* (*Menthaarvensis* L.) is useful in *Waja 'al Zahr* caused by *Galeez Riyah*.
- 3) In *Tibb-e-Akbar*, *Arzanistates Parindoka Ghosht* (flesh of birds) and *GarmMasaleh* (hot spices) is should be used in case of *Sue MijazBarid Sada*. He further suggests that *Taqleel-e-Ghiza* is the best in cases of *Waja 'al Zahr* due to raw phlegm. In *Imtela-e-Rag*, *Aab-e-anartursh-wa-Shereen*, *Sharbat lemon*, *Sheeratukhmkhayaren* and *Khurfa* with *Sikanjabeen* to be given.
- 4) *Jurjani* explain that *Aab-e-Nakhud* (black gram) is the best with *Waj* (*Acoruscalamus*) and *Shahed* (Honey).<sup>8,9,19,4,16</sup>

**Ilaj-bit-Tadbeer(Regimental therapy)**

- 1) **Dalak(massage):** *IbnSina* and *Jurjanis* suggests, before application of *Roghaniyat*, back should be rubbed with rough clothes. For examples, *Roghan-i-Gul*, *Roghan-i-Farfiyoon*, *Roghan-i-Narjeel*, *Roghan-i-Khuru*, *Roghan-i-Utraj*, *Roghan-i-Anjeer*, *Roghan-i-Qurtum* *Roghan-i-Habb-ul-Ghaar*, *Roghan-i-Suddab*, *Roghan-i-Raindi*, *Roghan-i-Farbiyon*, *Roghan-i-Qust*, *Roghan-i-Sosan*, *Roghan-i-Shibbit*, *Roghan-i-Baboona*, *Roghan-i-Farfiyoon*, *Roghan-i-Narjeel*, *Roghan-e-Khuru*, *Roghan-i-Utraj*, *Roghan-i-Anjeer*, *Roghan-i-Qurtum*<sup>4,8,9,16,19</sup>
- 2) **Fasd:** In case of *Imtela-e-Rag*, *Fasdof Basaleeq*, *Mabizand Safinveins* should be indicated to relieve acute pain.<sup>4,9,10,16,19</sup>
- 3) **Nutool(irrigation):** *Nutool* should be done with *Joshanda Munjiz Balgham*.<sup>16</sup>
- 4) **Hamman:** for *Tahleel Madda*.<sup>9,19</sup>
- 5) **Zimad(liniment):** *Zimad* is prepared by mixing *Muqil*, *Ushq*, *Hulba*, *Baboona*, *Habb-ul-Ghaar*, *TukhmAlsi*, *Jund-baid-astar*, *Rogan-e-baid-injeer*, *Jao-Sheer*, *Sakbeenaj* and *Farfiyoon*.<sup>4,8,9,10,16</sup>
- 6) **Hijamat:** *Razi* indicated that *Hijamat-i-Nariya* and *Hijamat-bila-Shart* should be very effective in *Waja' al Zahr*. *IbnSina* advice *Hijamat-bish-Shart* as well as *Hijamat-e-Nariya* in LBP.<sup>8,19</sup>

**Treatment (Modern)**

**Acute low back pain diagnosis:**

- Diagnostic triage (non-specific low back pain, radicular syndrome, specific pathology)
- History taking and physical examination
- Neurological screening is done with the help of physical examination (including straight leg raising test)
- Psychosocial factors is considered, if there is no improvement
- X-rays not useful for non-specific low back pain

**Treatment of acute low back pain:**

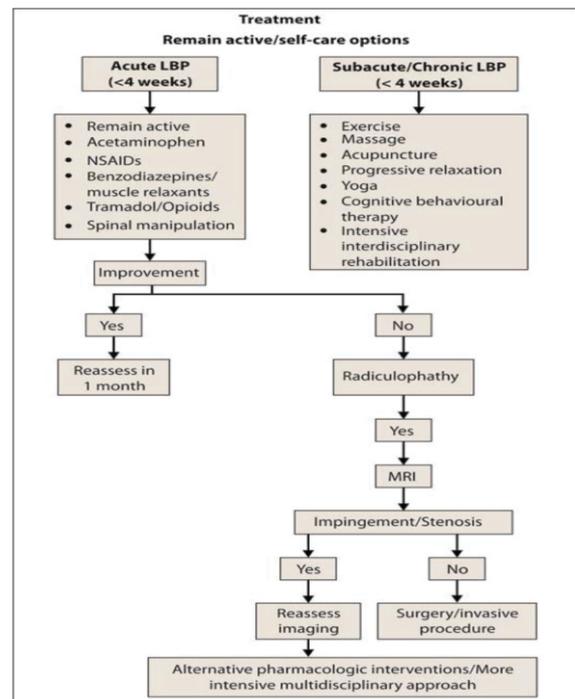
- Patients should be reassured
- Ensure patients should remain active
- Prescribe analgesics if necessary, such as paracetamol and non-steroidal anti-
- Inflammatory drugs (NSAIDs)
- Muscle relaxants or opioids may be given
- Bed rest should be discouraged
- Consider spinal manipulation for pain relief
- Back-specific exercises are not recommended

**Chronic back pain diagnosis:**

- Diagnostic triage to exclude specific pathology and nerve root pain
- Assessment of prognostic factors, namely work related factors, psychosocial distress, depressive mood, severity of pain and functional impact, prior episodes of low back pain, extreme symptom reporting and patient's expectations
- Imaging is not recommended unless a specific cause is strongly suspected
- Magnetic resonance imaging is best option for radicular symptoms, discitis or neoplasm
- Plain radiography is best option for structural deformities

**Treatment of chronic low back pain:**

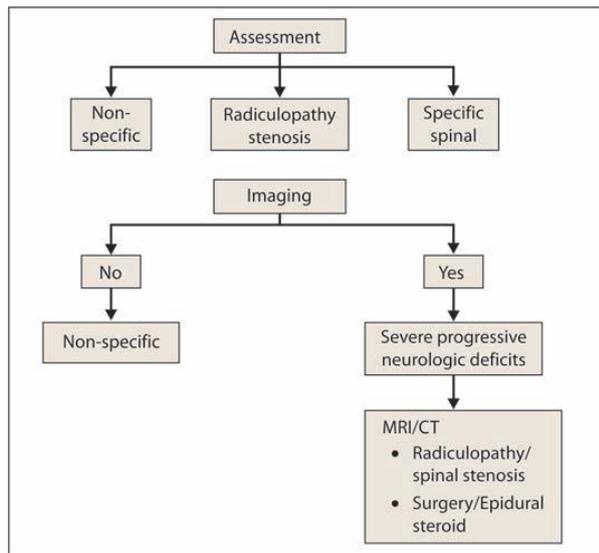
- Cognitive behavior therapy
- Supervised exercise therapy
- Educational interventions and multidisciplinary (biopsychosocial) treatment are recommended
- Short term use of NSAIDs and weak opioids are permissible
- Short courses of manipulation and mobilisation, noradrenergic or noradrenergic-serotonergic antidepressants, muscle relaxants and capsaicin plasters.
- Not recommended: Passive treatments like ultrasound and short wave and gabapentin.
- Generally, Invasive treatments are not recommended in chronic non-specific low back pain.<sup>22</sup>



### Investigation

- Complete blood count
- ESR
- X-ray Lumbosacral spine (AP and Lateral view)
- LFT: serum bilirubin, SGOT, SGPT, Serum, alkaline phosphate.
- KFT: blood urea and serum creatinine
- Urine routine and microscope.
- BS(F)

Additional investigations are computed tomography, magnetic resonance imaging, myelogram, bone scan, bone densitometry and single photon emission computed tomography (SPECT). The CT and MRI have significant importance in evaluating the anatomical details. The MRI is the most preferred investigations, although the CT defines the bony architecture of the spinal canal better than MRI. The MRI differentiates metastatic spinal fractures from osteoporotic lesions. Bone scan is a screening tool for the evaluation of inflammation and infection. In case of bone of osteoporosis, bone densitometry is suggested. The SPECT is performed when a bony abnormality is suspected. Biopsy is indicated in rare situations when the diagnosis of the bone pathology is not clear.<sup>1</sup>



### Differential Diagnosis

1. **Lumbosacral Strain:** Lumbosacral strain (LS) is the commonest among the young adults due to faulty sitting position. The characteristics of LS are spasmodic pain which increases with activity, tenderness on palpation and limited range of motion.<sup>17</sup>
2. **Acute Disc Herniations or Disc Prolapsed:** Disc prolapse is often associated with neurological

symptoms like altered sensation, weakness in the muscles, asymmetric reflexes. The quality of pain is sharp, shooting or burning pain, paraesthesia in leg, decreased with standing, increased with bending or sitting.<sup>17,23</sup>

3. **Spinal Osteoarthritis:** It is one of the most common findings on plain spine radiographs of patients with low back pain encountered at the ages between 55 and 60 years.<sup>24</sup>
4. **Ankylosing Spondylosis:** This is a painful stiffness condition of the spine, particularly felt in the early hours of the morning. It is more common in males, age about 15-40 years.<sup>25,17</sup>
5. **Spinal Stenosis:** This may be caused by a combination of bony overgrowth (e.g. osteophytes formation, Paget's disease), disc protrusion or herniations, or congenital anomalies, such as shortened vertebral pedicles.<sup>24</sup>
6. **Infection:** Infectious etiology of acute low back pain include osteomyelitis, septic discitis, and paraspinal or epidural abscess, whereas infectious etiologies of chronic low back pain include fungal or tuberculosis infections.<sup>26</sup>

### DISCUSSION

The main purpose of this review paper is to explore the Unani and modern concepts of *Waja 'al Zahr* and its management with special emphasis on *Habb-i-Gul-i-Aakh*. Pain and tenderness in *Waja 'al Zahr* developed due to the accumulation of *Akhlat-e-Fasida* (mainly *Ghair-tabyee-Balgham*) in the joint structures of lumbosacral region that leads to *Su'-i-Mizāj* (*Sue Mizaj Mukhtalif*). This leads to congestion, stagnation and blockage in surrounding structures. Nociceptors present in muscles, tendons, ligaments, joints, etc. are stimulated by the pressure exerted due to accumulation of morbid matter producing pressure symptoms like low back pain and tenderness. Difficulty in movement (walking) may be directly related to pain and stiffness in the lower back. Stiffness may be due to spasm in the joint structure like tendons, capsules etc. due to *Burudator* blockage of *Ghair-tabyee-Balgham*.<sup>27</sup> Consequently, *Usool-i-ilaj* given by USM mainly based on *Imala* (Diversion) or *evacuation* (excretion) of morbid matter which accumulates in joint structures.

### CONCLUSION

This review is an attempt to gather all the relevant information regarding research on role of Role of *Habb-i-Gul-i-Aakh* in the Management of *Waja 'al Zahr* (Low Back Pain). All the past and recent published data went through to collect the data. *Habb-i-Gul-i-Aakh* is the well known drug of USM for the treatment of *Waja 'al Zahr*.

In the light of scientific study, *Habb-i-Gul-i-Aakh* has been documented for anti-inflammatory, analgesic and anti-arthritis effects. This justifies the unani literature in the context of scientific study. However, further studies are required to determine the mechanism of its pharmacological activities.

#### CONFLICT OF INTEREST:

Authors declare no conduct of interest.

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#### List of Abbreviations

Abbreviations	Definitions
LBP	Low Back Pain
LS	Lumbosacral spine
USM	Unani System Of Medicine
NSAIDS	Non-Steroidal Anti-Inflammatory Drugs
ESR	Erythrocyte Sedimentation Rate
APV	Anterior Posterior View
LFT	Liver Function Test
KFT	Kidney Function Test
BSF	Blood Sugar Fasting
CT	Computed Tomography
MRI	Magnetic Resonance Imaging
SPECT	Single Photon Emission Computed Tomography

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## EFFICACY OF A UNANI REGIMEN IN THE TREATMENT OF *FALIJ-E-NISFI* (HEMIPLEGIA): CASE SERIES

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### ABSTRACT

*Falij-e-Nisfi* (Hemiplegia) is a condition in which there is loss of movement and sensation in longitudinal half of the either side of the body. It is the commonest form of paralysis, occurring due to stroke or cerebrovascular accident. Stroke is the leading cause of disability worldwide and second most common cause of death. Post stroke hemiplegia is most common causes of disability in adults. In India its prevalence is 56.9 per 100,000. Unani scholars from various part of the world have been treating the condition of *Falij-e-Nisfi* (Hemiplegia) since centuries successfully. Different effective regimes are available in Unani system of medicine (USM) for the treatment of *Falij-e-Nisfi* (Hemiplegia). Those treatments are effective and having fewer side effects. In the present paper the case studies of two female patients suffering from *Falij-e-Nisfi* (Hemiplegia) due to stroke treated with Unani formulations is reported. This case series documented the successful treatment and prevention of recurrence of hemiplegia through Unani medicines. It concluded that the Unani regimen was effective and safe in the management of hemiplegia.

No. of Pages: 6

References: 18

**Keywords:** Cerebrovascular Accident, Disability, *Falij-e-Nisfi* (Hemiplegia), Nervous System, Stroke.

### INTRODUCTION

Falij is an Arabic word meaning "to halve". Falij is a paralytic condition where loss of movement and sensation in longitudinal half of the body on either side starting from below the neck, sparing head or face and covering the entire longitudinal half the body from head to foot.<sup>1</sup> This description similar with hemiplegia in allopathic system of medicine. It is a well-known neurological disorder may occurs at any age, any time, in either sex but mostly affect Barid Mizaj (Phlegmatic temperament) people.<sup>2</sup> In Greco-Arabic period falij was first described by Buqrat (Hippocrates, the father of medicine (360 B.C)) after him other physicians such as Galenos (Galen 129-200 A.D) Rabban Tabri (770-850 A.D), Sabit Ibn Qurrah (836-903 A.D), Ali bin Abbas Majusi (900-994 A.D), and Ibn Sina were described its aetiology, pathophysiology, clinical features, prognosis, treatments and its complications.<sup>1</sup> In Unani system of medicine (USM) falij was divided into four types 1). Falij-e-Muqami: in which specific organ or part of the body get paralysed such as hand, leg and tongue. 2) Falij-

e-Asfal (Paraplegia): lower part (below the back) of the body get paralysed. 3) Falij-e-Aam (General paralysis): in which all part and muscles of the body get paralysed. 4) Falij Ma Laqwa (Hemiplegia with Facial Palsy): paralysis in longitudinal half of the body including face. 5) Falij-e-Nisfi (Hemiplegia): in which loss of movement and sensation in longitudinal half of either side of the body.<sup>3</sup> It is the commonest form of paralysis, occurring most commonly due to stroke or cerebrovascular accident.<sup>1</sup> Stroke is the major leading cause of disability all over the world and second most common cause of death.<sup>4</sup> Post stroke hemiplegia is most common causes of disability in adults.<sup>5</sup> In India its prevalence is 56.9 per 100,000.<sup>6</sup> Falij occurs due to Sudda (obstruction) in Asab (nerves), Sharain wa Auradha (arteries and veins) and Butoon-e-Dimagh (Ventricles of brain), they arrest penetration of Rooh Hassas (sensory impulses) and Rooh Muharrrik (motor impulses) into the organ and cause Falij. Sudda is usually composed of Ghaleez and Luzj Balgham (thick and vicid phlegm). Falij is caused by Ghair Tabai Balgham hence

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its Mizajis considered as Balgham i.e Barid Ratab (cold and wet). Older people in their advance age develop Barid mizaj (cold temperament) hence they have more risk to develop falij. Falij also occurs due to failure of organ in respond to the stimulation by Arwah due to fasad-e-Mizaj. According to Avicenna "Tanqia should be the first choice if the cause of a disease is morbid Akhlat". In Unani treatment of Falije Nisfi consists of Tanqia Mawade Raddiya (evacuation and cleansing) Ta'deel Mizaj (rejuvenation), Taqwiate Aam and Taqwiate Aasab.<sup>4</sup> Census 2011 (India) has revealed that 5,436,604 persons are paralysed due to different causes, which ultimately lead to physical, psychological, social & economic burden on the community.<sup>7</sup> In conventional system of medicine the treatment is too costly and time taking hence Unani system of medicine has treasure of single and compound drugs are very effective in treatment of Falij-e-Nisfi (Hemiplegia).

**Case 1: Patient information and clinical finding:** A 38 years old female patient visited to the Mohammadia tibia college & assayer hospital (Mansoor), Malegaon in outpatient department, with complaints of weakness of muscles of the Left side of the body, difficulty in walking, unable to hold the objects, difficulty to perform daily routine work, loss of sensation in affected side of the body, difficulty in speech from 8 days. The patient is well before 8 days ago then she developed of sudden onset of headache and hand pain followed by sudden weakness of muscles of left side of the body.

**On Examination:** A 38 year old female was 156cm tall with weight 70kg so BMI is 28.8 kg/m<sup>2</sup>. The heart rate was 86/min while B.P. was 130/90 mm Hg with 98.6F temperature, respiratory rate was 18/min. The heart, lung, abdomen and renal system were normal. Pallor was present and jaundice and cyanosis were absent. She was married female taking mixed diet but appetite was reduced hence bowel habit not cleared with reduced frequency and quantity of micturition. Patient was hypertensive since 3 years taking TELMA 40 mg (OD) at night. The personal and family histories were negative for DM & HTN. On Nervous Systemic Examination patient was well oriented to time, place and person with intact higher mental function (memory, speech & intelligence). All **Cranial nerve** from 1 to 12<sup>th</sup> were normal in their function except 7<sup>th</sup> cranial nerve (facial nerve) is slightly affected (watering from the eyes). In left side of the body **sensory system** is slightly low as compare to right side of the body. Patient has less sensation with pin and blunt objects, temperature sense (hot and cold), Vibration sense (tuning fork) and patient was unable to identify the position of finger or toe of left

side of body. Superficial reflexes (planter reflex, abdominal reflexes and Wartenbergs sign) were normal in right side of body and diminished in left side of the body. Deep reflexes (Bicep, triceps, ankle, knee and finger flexion, supinator reflexes) were diminished in left side of the body. Muscle power was mentioned in table No.1 and muscle tone was diminished in left side of body. Cardiovascular system (CVS) was normal on inspection. Apex beat is palpable in 5th ICS without any tenderness. On auscultation S1-S2 heard, no any added sound and no murmur was found. Respiratory system was normal chest was B/L symmetrical with normal movement with no any scar and tenderness, with normal resonating note and Air entry bilaterally equal (AEBE). Abdomen was scaphoid in shape, umbilicus was normal, no any scar mark or venous engorgement. On percussion Dullness over the abdomen and no fluid trill and shifting dullness. Bowel sound was 5-7t/minute.

**Table 1: Muscle power of Case 1.**

Before			After		
	Upper limb	Lower limb		Upper limb	Lower limb
Right	5/5	5/5	Right	5/5	5/5
Left	2/5	1/5	Left	4/5	5/5

**Diagnosis:** The patient was diagnosed on the basis of Computed Tomography Scan of Brain and physical examination. The legend 1 is the report of the high resolution and real time CT scan of brain done on 26/05/21 before start of treatment. This report confirmed that there was hematoma measures about 2.7×1.5 cms in right lentiform nucleus and corona radiate. The investigations CT scan, Urine analysis, Liver Function Test, Haemogram and Kidney Function Test were performed at base-line and post treatment.

**Case 2: Patient information and clinical finding:** A female patient of 47 years old person visited the Mohammadia tibia college & assayer hospital (Mansoor), Malegaon in outpatient department, with complaints of weakness of muscle left side of the body, difficulty in walking, unable to hold the objects, difficulty to perform daily routine work, loss of sensation in affected left side of the body, difficulty in speech from 15 days.

**On Examination:** A 47 year old female was 158cm tall with weight 53kg so BMI is 21.2 kg/m<sup>2</sup>. The heart rate was 78/min while B.P was 140/90 mm Hg with 98.6 F temperature, respiratory rate was 16/min. The heart,



**Legend 1: The finding of CT scan at baseline.**

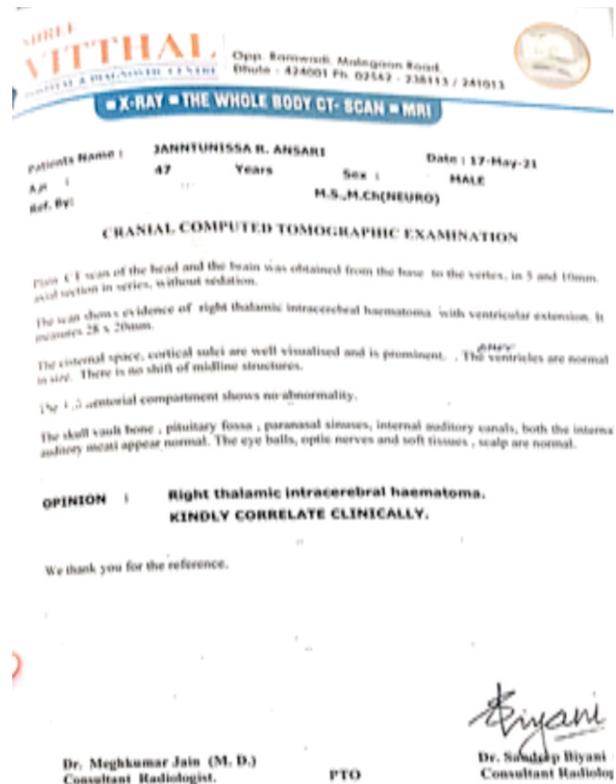
lung, abdomen and renal system were normal. Pallor was present, jaundice and cyanosis were absent. She was married female taking mixed diet but appetite was reduced hence bowel habit not cleared with reduced frequency and quantity of micturition. Patient was hypertensive since 3 years taking Amlodipine 5mg (OD) at night. The personal and family histories were negative. On Nervous Systemic Examination patient was well oriented to time, place and person with intact higher mental function (memory, speech & intelligence). All Cranial nerve from 1 to 12<sup>th</sup> are normal in their function except 7<sup>th</sup> cranial nerve (facial nerve) is slightly affected (watering from the eyes). In right side of the body sensory system was slightly low as compare to left side of the body. Patient has less sensation with pin and blunt objects, temperature sense (hot and cold), Vibration sense (tuning fork) and patient was unable to identify the position of finger or toe of left side of body. Superficial reflexes (planter reflex, abdominal reflexes and Wartenbergs sign) are normal in right side of body and diminished in left side of the body. Deep reflexes (Bicep, triceps, ankle, knee and finger flexion, supinator reflexes) were diminished in left side of the body. Muscle power was mentioned in table No.1 and muscle tone was diminished in left side of body. Cardiovascular system (CVS) was normal on inspection. Apex beat is palpable in 5th ICS with no any tenderness. On auscultation S1-S2 heard, no any added sound and no murmur was found.

Respiratory system was normal chest was B/L symmetrical with normal movement with no any scar and tenderness, with normal resonating note and Air entry bilaterally equal (AEBE). Abdomen was scaphoid in shape, umbilicus was normal, no any scar mark or venous engorgement. On percussion Dullness over the abdomen and no fluid trill and shifting dullness. Bowel sound was 6-9t/minute.

**Table 2: Muscle power of case 2.**

Before			After		
	Upper limb	Lower limb		Upper limb	Lower limb
Right	4/5	5/5	Right	5/5	5/5
Left	2/5	1/5	Left	4/5	5/5

**Diagnosis:** The patient was diagnosed on the basis of Computed Tomography Scan of Brain. The legend 2 is the report of the high resolution and real time CT scan of brain done on 17/05/21 before start of treatment. This report confirmed that right thalamic intracerebral haematoma was measures about 28x20 mm. The investigations USG (whole abdomen), urinalysis, Liver Function Test, Haemogram and Kidney Function Test were performed at base-line and post treatment.



**Legend 2: The finding of CT scan at baseline.**

**Dietary restrictions:** Patient was advised to restrict Beef, Meet, chicken, oily food, spicy food and fried food. Avoid to use of cold water and cold foods. He was also advised to cover the affected side with cloths (protect from cold environment) and take hot food. Daily exercise and walking was advised.

#### Intervention and follow-up:

Both the patient received following Unani compound formulations for 6 weeks.

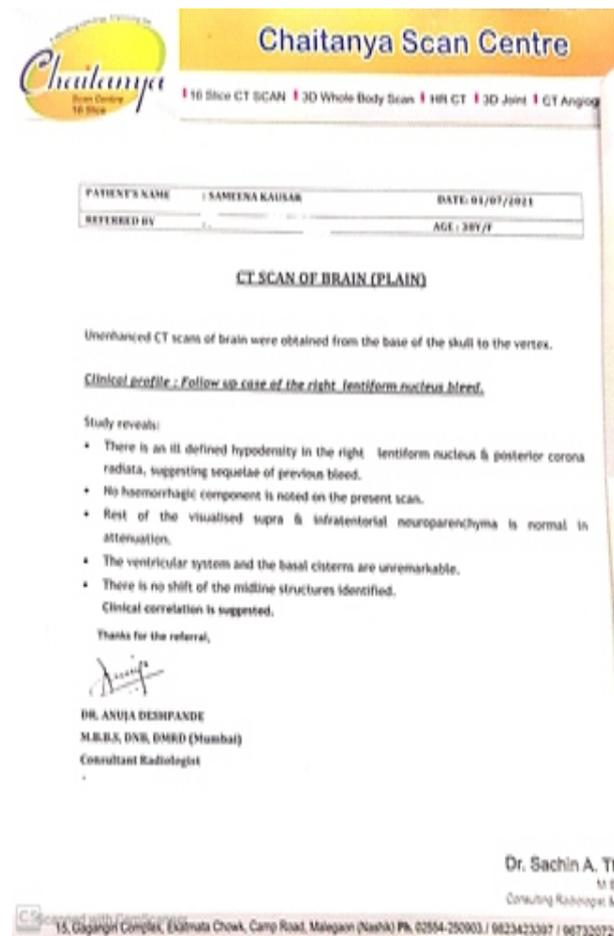
- **Akseer Azraqi (AQ):** 20mg twice a day (Azraqi Mudaber (*Strychnus Nux-Vomica Linn*) 10 gm, sugar 250 gm).<sup>8</sup>
- **Joshanda Munzij (JM):** As a decoction 100 ml twice a day (Aslussoos (*Glycyrrhiza Glabra Linn*, 5gm.), Unnab (*Zizyphus Vulgaris*, 5gm), Sapista (*Cordia Myxa*, 5gm), Khatmi (*Althaea Officinalis Linn*, 5gm), Khaksi (*Sisymbrium Irio Linn*, 5gm), Gauzaba (*Borago Officinalis Linn*, 5gm), Adhosa (*Justicia Adhatoda*, 5gm), Ustekhudoos (*Lavandula Stoechas*, 5gm), Khubazi (*Common Mallow*, 5gm)).<sup>8</sup>
- **Akseer Momiyai (AM):** 5 mg twice a day (Shibb-e-yamani (*Alum*) 100gm and Shingraf (*Cinnabar*) 100gm).<sup>8</sup>
- **Akseer Dimag (AD):** 20 mg twice a day (Magz kaddu shire (*Lagenaria siceraria*) 25gm and Sugar 225gm).<sup>9</sup>
- **Habb-e-Balchad (HB):** 2 tablet twice a day (Balchadh (*Nordostachys Jatamansi*, 50gm), Alovera 50gm, Kafoor (*Cinnamomum Camphora*, 50gm), Neem (*Azadirachta Indica*, 50gm), Hilteet (*Ferula Foetida Regel*, 50gm).<sup>10,11</sup>
- **Rogan-e-Farfune (Masiha):** Khardal oil (*Brassica Nigra*) 1lit, Farfune 20gm, lahsan (*Allium saivum*) 50gm.<sup>8</sup>
- **Akseer Kahu (AK):** 20 mg twice a day (Tukhme kahu (*Lactuca Sativa Linn.*) 25gm, sugar 225gm).<sup>10</sup>
- **Aqirqarha (Spilanthes Acmeila):** Bar-e-Mazug (Madugh).<sup>10</sup>

In Unani system of medicine these formulations are used to treat clinical conditions such as Falij (Hemiplegia), Laqwa (Facial palsy), Zofe Asaab (Weakness of nerves, Neurasthenia), Wajaul Asaab (Neuralgia), Irq-un-nisa (Sciatica), Sudda-e-urooq (Obstruction in Vessels), Waja-ul-mafasil (Arthritis), Sara (Epilepsy).<sup>8</sup> They were regularly taking antihypertensive drug once daily to

control hypertension. The patient was followed up every 8 days to monitor his health condition for 6 weeks. The patient was supplied medicines from the dispensary of the hospital every 8 days to observe compliance to the therapy.

#### Observation and outcome

It was observed that patient had the complaints of difficulty in speech and swallowing at base line which improved after 8 days of treatment at first follow up. The other symptoms resolve till the end of the treatment and post treatment follow up period of 6 months. The vitals of the patient remained stable during course of observation and treatment. After 6 weeks of treatment, CT Scan of brain report as mentioned in legend 2 confirmed that there is resolving of haematoma. The kidney function (serum creatinine and blood urea nitrogen) and liver function profile (SGOT, SGPT, Serum Alkaline Phosphatase, Serum bilirubin) at base line and post treatment were within normal limits as shown in table-1,2. It was also observed that there no adverse drug reaction during the treatment period.



**Legend 3: The finding of CT scan after treatment.**



**Legend 4: The finding of CT scan after treatment.**

## DISCUSSION

In this case series, it was observed that the Unani regimen comprising of three formulation Akseer Azraqi, Joshanda Munzij, Akseer Momiyai, Akseer Dimag, Akseer Kahu, Hab-e-Balchadh and Aqirqarha were effective and safe in the management of Falij (Hemiplegia). This Unani regime was formulated keeping in mind the principles of treatment for nervous disorders as per therapeutic approach of Unani System of Medicine. Nervine tonic and Nervine stimulant are used for the management of nervous disorders.<sup>8</sup> Falij (Hemiplegia) is completely due to stroke in both the cases. The effectiveness of the Unani regimen in these cases might be explained in terms of pharmacological actions of the formulations which mainly nerve stimulating, anti-hemorrhagic, anti-inflammatory activity, cardio-protective activity, hypotensive, diuretic, immune tonic, rejuvenative, anti-parkinson activity, Concoctive of Phlegmin, Neuroprotective activity and anti-coagulation activity and vascular dilator properties present in their ingredient. The affected part was paralysed at baseline but after 6 weeks of treatment, the hand and leg becomes almost normal. There was no complaints of weakness and disability.

**Akseer Azraqi and Akseer Momiyai:** this compound is useful as Muqawwi-i-A'sab (nerve tonic) and Muharrik-i-A'sab (nerve stimulant) in USM. Both cases

are hypertensive and having heamatoma in brain of different size, Shubb-e-yamani (Alum) one of its ingredients possess hemostyptic, detergent and diuretic properties. The study conducted by Al-abbasiM A, demonstrated Anti-Hemorrhagic properties of alum. But the mechanism by which alum stop bleeding is not clearly understood. Hence these compound effective in both case of Falij (hemiplegia).<sup>12</sup>

**Joshanda Munzij:** Contain Glycyrrhiza Glabra Linnestudy conducted by Ojha *et al.* evaluated the cardioprotective effect of Glycyrrhiza Glabra against ischemic reperfusion injury. Another study carried by chakravathi kk *et al* showed memory enhancing property.<sup>13</sup> The study conducted by Al-Snafi demonstrated that hypotensive activity of Cordia Myxa. Unripe fruit of Cordia Myxa decreased rabbit blood pressure due to activation of parasympathetic ganglia and dilation of peripheral blood vessels.<sup>14</sup> Another study showed neuroprotective effect (reperfusion of cerebral tissues in focal necrosis 200 mg/kg), memory enhancing and reduce cerebral oedema in brain stroke (100-400 mg/kg) of Lavandula Stoechasoil.<sup>15</sup>

**Habb-e-Balchad:** The study conducted by SAHU Ret al showed effectiveness of Nordostachys Jatamansiin focal ischemiaby its antioxidant property.<sup>16</sup> The study carried out Mahendra P. demonstrated that antihypertensive effective, vasodilation effect and neuroprotective effect of Ferula Foetida Regel.<sup>17</sup>

**Aseek Kahu:** Tukhme kahu (Lactuca Sativa Linn.) Intermediate polarity fraction of L. sativa ethyl acetate fraction exerts neuroprotection against glucose/serum deprivation (GSD)-induced cell injury, an in vitro model of brain ischemia can be used in common neurodegenerative disorders such as stroke.<sup>18</sup>

## CONCLUSION

Falij (Hemiplegia) is a Nervous system disorder. According to the Unani concept, many factors are responsible such as stroke and fasad mizaj barid. Effective management is resolving symptoms and countering the recurrence of the disease. The affordability, availability, and side effects of prolonged use of allopathic drugs remain a challenge and concern. The discovery of safer and more effective anti-hemiplegic drugs remains an area of active research at present. Excellent tolerance and acceptability were observed in a patient without any reported side effects. These results indicate that Unani compound formulations produce significant improvements in subjective and objective parameters and CT Scan. Hence, it may be

concluded that the above drugs can be used safely and effectively for the treatment of Hemiplegia. Randomized clinical trials are needed to reveal a new and novel therapeutic option for satisfactory treatment of hemiplegia through Unani classical drugs.

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## ROLE OF *ILAJ BIL GHIZA* (DIET THERAPY) IN PREVENTION OF LIFE STYLE DISORDERS

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### ABSTRACT

*Tibb-e-Unani* is a completely developed system of medicine which is well known for the prevention and management of the diseases. In classical literature of Unani system, modes of treatment classified as *Ilaj-bit-Tadbeer-wa-Taghzia*, *Ilaj-bi'l-dawa* and *Ilaj-bi'l-Yad*. The basic concept of disease in Unani system is that disease occurs when the individual is deviated from *Asbab-e-Sitta Zaroriyah* (six essential factors). Modification in these essential factors is necessary to achieve the health and maintenance of normal functions of the body. *Makool-wa-Mashroob* (foods and drinks) is the second most important factor among them. Good nutrition is vital for complete health and essential for physical growth, normal body composition and mental development. Individual's nutritional state can protect them from or predispose them towards chronic disease. Nutrition is thus both a preventive and a healing science. A modified diet is one that has been altered to include greater or fewer nutrients, to impact a variation in the texture or consistency of what is ingested, or to limit the consumption of any substance.<sup>[2]</sup> Almost all ancient Unani scholars and physicians such as Hippocrates, Galen and Rhazes etc. have compiled number of books on diet therapy on the basis of the principle of *Makool wa Mashroob* (foods and drinks). Some specific modified diets such as *Ma'ushaeer* (barley water), *Ma'ulahm* (meat distillate), *Ma'ul Asl* (honey water), *Rububiyat* (fruit's extract), *Ma'ul jubn* (whey), mentioned in authentic Unani literature. These modified diets are very much effective in the prevention of noncommunicable diseases (NCD's). Recent studies exhibited these modified diets are rich in nutrients, antioxidants, minerals, etc. Therefore it may be used for prevention of various ailments such as diabetes, obesity, hypertension, etc. In the present paper an attempt has been made to discuss the importance of Unani dietetics in the prevention of NCD's.

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References: 18

**Keywords:** Diet therapy, Modified diets, Unani medicine, *Ilaj Bil Ghiza*, Life style disorders.

### INTRODUCTION

*Tibb-e-Unani* is a completely developed system of medicine which is well known for the prevention and management of the diseases. In classical literature of Unani system, modes of treatment classified as *Ilaj-bit-Tadbeer-wa-Taghzia*, *Ilaj-bi'l-dawa* and *Ilaj-bi'l-Yad*. The basic concept of disease in Unani system is that disease occurs when the individual is deviated from *Asbab-e-Sitta Zaroriyah* (six essential factors). Modification in these essential factors is essential to achieve the health and maintenance of normal functions of the body. *Makool-wa-Mashroob* (foods and drinks) is the second most important factor among them. An

individual needs sufficient amount of nutrients in appropriate proportions for normal growth and developments, dietary deficiency may be both qualitative and quantitative. If these nutrients not present in daily diet, deficiency arises in human body. The term nutrients refer to those chemical substances in foods that are required in the diet for survival and well being of the organisms of the body. Organisms are composed of cells that are functioning units of the body. Cells are said to be self-replenishing that is when components are broken down those components can be rebuilt from substance provided in the diet. Cells are also said to be energy converting units that is they take one form of energy and

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convert it into chemical energy used in the cell for rebuilding new components or for movement. Thus, nutrients play an important role in providing or using raw materials to rebuild body components and for providing energy. Nutrition then refers to the chemical components that are required in the diet for the organism to function normally. Metabolism refers to the chemical process involved in the use of nutrients.<sup>[2,3]</sup>

**Mohd Ibn Rushd** defined diet in his book *Kitabul-kulliyat* as “Diet is a substance when enter in the body can able to convert into parts of body like cells and tissues”. **Rhazes** mention many forms of modified diet in his book *Kitab-al-Mansoori*, which are beneficial and acts as preventive as well as therapeutic measures against diseases. Renowned Unani physician **Kabeeruddin** states in his book *Kulliyat-e-Nafeesi* about the uses of diet according to their effects and benefits in different seasons. He also guides about the importance of time and punctuality about meals to maintain good health. WHO defines health in these words “health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity”. Some diet has also different effects on different temperaments. So according to the concept of temperament of the diet should be chosen to give best results and can act as a preventive measure against some specific disorders belongs to specific temperaments of individuals. **Mohd Akbar Arzani** mentioned in his book about uses of diet in the management of general debility and functional deficiency of many body organs. If left untreated can lead to organ's failure as well. **Ibn Hubal Baghdadi (1121-1213AD)** a botanist and ancient Unani scholar and physician has specified several diets in his book *Kitab-al-Mukhtarat-fi-al-Tib*, which can be used in the prevention of NCD's.<sup>[1,5,6,12,13,14]</sup>

Unani system of medicine based on *Asbab e sitta zaroorya* (six essential factors) which comprises of *Hawae Muheet* (Atmospheric air), *Makoolat wa Mashroobat* (Foods and Drinks), *Harkat wa Sukoon Badni* (Physical activity and Repose), *Harkat wa Sukoon Nafsan* (Mental activity and Repose), *Naum wa Yaqza* (Sleep and Wakefulness), *Ehtebas wa Istafraqh* (Retention and Excretion).<sup>[1]</sup> *Makoolat wa Mashroobat* (Foods and Drinks) is one of the most important essential factor which need to be follow properly as per guidance of ancient Unani scholars. It is the principle which can be adopted easily. In Unani system the basic objective is to modify the dietary habits as per needs of subjects. Foods rich in their nutritional values have an important role in prevention of diseases as well as in their management. **Hippocrates** (BC 460-370) elaborated the importance of

*Makool* (diet) for healthy life according to age. This concept said that diet provides *Badal Ma Tahallal*. It plays an important role in maintaining the harmony of *Akhlat Arba* (four humours). **Razi** had advocated that body needs the food and drinks to overcome the continuous dissolution from birth to death.<sup>[1,5,10]</sup>

**Malnutrition** which can be described as a pathological condition resulting from a relative or absolute deficiency or excess of one or more vital nutrients which can be evident into over nutrition or under nutrition disproportion. Malnutrition can be threatening to the physical, psychological, behavioral, mental, emotional wellbeing of the individual. A malnourish person will be below in normal height and weight as compared to the normal person. Person has low resistance to and high susceptibility for infections. Normal body function can be hindered i.e., intestinal tract, liver, lungs etc. in contrast of malnutrition over consumption of calories, vitamins and minerals can result in over nutrition that is **obesity**. Apart from the metabolic syndrome, obesity is similarly co-associated with a variety of other consequences such as diabetes mellitus, hypertension, and dyslipidemia. An inflammatory condition is present which together with the above consequences has been linked with the high prevalence of atherosclerosis (fatty lumps in the arterial wall), and a prothrombotic condition may further deteriorate cardio-vascular risk. The basic principle for the management of obesity is limited calorie diet with low fatty and high fibrous diet. **Hypertension** is term used for a condition of the body in which blood pressure is higher than normal. Hypertension is one of the most common consequences of obesity. Hypertension can involve many vital organs and systems including the cardiovascular, renal, central and autonomic nervous system etc. thus, becomes a major risk factor of stroke, coronary heart disease, congestive heart failure. **Osteoporosis** a disease that makes bone fragile. Low diet of calcium and vit D deficiency diseases. Severe joint pain, bone pain, stiffness of legs, stiffness of joint arises in this disease. Vit D is required for normal growth, it increases the calcium and phosphorus absorption from the gastrointestinal tract.

**Diabetes mellitus** is metabolic syndrome characterized by the decreased ability or complete inability of the tissues to utilize carbohydrates, accompanied by change by metabolism of fat, protein, water electrolytes. The risk factors of disease includes malnutrition, over nutrition, obesity and stress etc. some serious liver disorders are also caused by factors such as dietary deficiency and can be prevented or cured by diet

modifications. Individuals who are prone or who are suffered from this serious ailment. Most maternal deaths are due to poor antenatal pregnancy diet and even when women survive, they are at higher risk for many health hazards and malnutrition. **Maternal malnutrition** caused by insufficient nutrition during pregnancy. It also affects the normal development of the fetus.<sup>[2,3]</sup> Almost all ancient Unani scholars and physicians such as Hippocrates, Galen and Rhazes etc. have compiled number of books on diet therapy on the basis of the principle of *Makool wa Mashroob* (foods and drinks). Some specific modified diet such as *Ma'ushaer* (barley water), *Ma'ulahm* (meat distillate), *Ma'ul Asl* (honey water), *Rububiyat* (fruit's extract), *Ma'ul jubn* (whey), mentioned in authentic Unani literature and manuscripts are found very beneficial and acts as preventive measure against many serious illnesses. Prevalence rate of life style disorders increasing rapidly so it is a need of an hour to adopt non pharmacological management such as Diet therapy which is cost effective and very easy to practice.

## Diet as a Preventive Medicine

### 1. *Ma'ul Lahm* (meat distillate):

**Method of preparation:** it is made by taking goat meat in a heavy bottom utensil then add some rose water then cover the utensil with tight lid and cook under low flame when water and meat separates and meat tender almost at this point drain the all-liquid part from meat and then boil this liquid again for some time.<sup>[5,11]</sup>

**Nutrients:** Iron, Folate, Copper, Manganese, Selenium.<sup>[15,16]</sup>

**Uses:** It is rich in protein which is essential for the structure of red blood cells, for regulation of enzymes and hormones, for development and healing of body tissues. Thus, it is indicated for strengthening heart, malnourished patients, anemia and cachexia.<sup>[5,6,7,11]</sup>

### 2. *Ma'ul Asl* (honey water):

**Method of preparation:** it is made up of honey and water in 1:6 ratio respectively. Boil the mixture till it remains half of its quantity.<sup>[5]</sup>

**Nutrients:** Sodium, Potassium, Carbohydrate, Dietary fiber, Sugar.<sup>[15,17]</sup>

**Uses:** it is rich in dietary fibers which helps in lowering blood cholesterol by inhibiting digestion of fat and

cholesterol. Therefore, it is indicated in *Amraz e barda* such as hemiplegia, bell's palsy, arthritis. it also helps to prevent constipation thus helpful in hemorrhoids, strengthen stomach and correct anorexia.<sup>[5,6,7,17]</sup>

### 3. *Ma'ul Jubn* (whey):

**Method of preparation:** it is obtained by adding lemon drops in boiling milk then water separated from milk is drained and preserved this water called *Ma'ul Jubn*.<sup>[5]</sup>

**Nutrients:** Fat, Cholesterol, Sodium, Potassium, Carbohydrate, Dietary fibers, Sugar, Protein, Vit c, Calcium, Iron, Vit b<sub>6</sub>, Cobalamin, Magnesium.<sup>[15,18]</sup>

**Uses:** It is rich in vitamins and minerals which are required for the regulation of the body's metabolic functions, also helpful in cell growth, acts as a blood purifier, it contains calcium thus helpful in calcium deficiency. It contains amino acids which is very important for the mental growth.<sup>[5,6,7,11,18]</sup>

### 4. *Ma'ushaer* (barley water):

**Method of preparation:** Peeled barley (which is termed as "*jau muqashar*" in Unani medicine) boiled in water in the ratio of 1:10. During boiling process remove impurity at intervals. Hippocrates also mentioned 10 properties of barley water.<sup>[5,10]</sup>

**Nutrients:** Iron, Folate, Copper, Manganese, Selenium, Polyphenols.<sup>[15,19]</sup>

**Uses:** It is rich in polyphenols which are antioxidant, anti-inflammatory thus useful in fever, tuberculosis, febrile convulsion. It has diuretic property which is beneficial in urinary tract infection as it reduces burning micturition.<sup>[5,6,7,11,19]</sup>

### 5. *Rub e Rumman* (Pomegranate extract):

**Method of preparation:** Extract is obtained from sour pomegranate then rest it overnight in tight container then boil it.<sup>[5]</sup>

**Nutrients:** Sodium, Potassium, Carbohydrate, Dietary fiber, Sugar, Vit c, Iron.<sup>[15]</sup>

**Uses:** Anemia and boosts immunity. It is considered as *qata e safra* in Unani medicine. Thus, beneficial in nausea and vomiting and useful in cholera. Removes excess bile from body.<sup>[5,6,7]</sup>

**Table 1: Modified diet for specific conditions.**

Sr. No.	Modified diet	Nutrients	Uses
1.	Ma'ul lahm (meat distillate)	iron, folate, copper, manganese, selenium. [15,16]	Strengthens heart, malnourished patients, anemia and cachexia. [5,6,7,11]
2.	Ma'ul Asl (honey water)	sodium, iron, potassium, carbohydrate, dietary fiber, sugar, zinc, calcium, magnesium, selenium. [15,17]	Amraz e barda such as hemiplegia, bell's palsy, arthritis. it also helps to prevent constipation thus helpful in hemorrhoids, strengthen stomach and correct anorexia. [5,6,7,17]
3.	Ma'ul Jubn (whey)	fat, cholesterol, sodium, potassium, vitA, carbohydrate, dietary fibers, sugar, protein, vit c, calcium, iron, vit b6, cobalamin, magnesium. [11,18]	Blood purifier, helpful in calcium deficiency. Helpful in mental growth, promotes muscle health, cures burning micturition, helps to burn fat. [5,6,7,11,18]
4.	Ma'ushaeer (barley water)	iron, folate, copper, manganese, selenium, polyphenols, protein, carbohydrate, fiber. [15,19]	antioxidant, anti-inflammatory thus useful in fever, tuberculosis, febrile convulsion. It has diuretic property which is beneficial in urinary tract infection as it reduces burning micturition, support immune system. [5,6,7,11,19]
5.	Rub e Rumman (pomegranate extract)	sodium, potassium, carbohydrate, dietary fiber, sugar, vit c, iron, vit b6, protein. [15]	beneficial in anemia and it boost immunity. qatae safra, Beneficial in nausea and vomiting and useful in cholera. Removes excess bile from body. [5,6,7]

**CONCLUSION**

Diet therapy is practiced over centuries and found very much effective in the prevention of noncommunicable diseases. Even many ancient Unani physicians such as Hippocrates, Galen, Rhazes etc. guided us about the benefits of Diet therapy in their treatises. Prevalence rate of life style disorders is increasing very rapidly so there is a need of nonpharmacological management such as diet therapy which is very economical and easy to adopt for the prevention of these noncommunicable diseases.

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## MANAGEMENT OF LIVER DISORDERS IN UNANI MEDICINE: A REVIEW

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### ABSTRACT

In Unani system of medicine, *Jigar* (liver) is considered as a vital organ, The main function of the liver is *Istehala* (metabolisms) through which it produces *Hararat-e-ghareeziyah* (innate heat of the body) and *Akhlat* (humors) for the body, it plays a central role in the metabolism of large number of organic and inorganic chemicals and drugs. It receives large amount of nutrients and xenobiotics through digestive portal vein becoming the target organ of several classes of toxicant. The modern medicines have little to offer for easing of hepatic diseases whereas most important representatives are of Phytoconstituents. It has been reported that medicinal plants have sufficient potential to offer effective and safe hepatoprotective drugs. The Indian system of medicine like Ayurveda and Unani system, have a major role in the treatment of liver ailments.

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References: 15

**Keywords:** *Jigar*, *Zof-e- Jigar*, *Sue Mizaj*, Hepatoprotective, Unani medicine.

### INTRODUCTION

According to Unani medicine liver is origin of natural *Qawa* (natural power). Liver is an organ composed of fine blood vessels which form the base of two large blood vessels, which arises from above and below part of liver, the one vessel that arises from above known as *Ajwaf nazil* (inferior vena cava) and second vessel which arises from below part known as *Bab-ul-kabid* (portal vein). Liver is main source of nutrition synthesis. *Masariqa* (Mesenteric vein) absorb *Kailoos* (chylus) from intestine and transport to liver<sup>[1,2]</sup>. Chylus that is product of first digestion deliver to liver for the second stage of digestion or hepatic digestion to produce humour. The most important function of liver is to produce *Akhlat* (humour) for nourishing, growing and developing the body<sup>[2,3]</sup>.

### Pathophysiology of Kabid (liver)

In Unani system of medicine *Jigar* (liver) is considered as vital organ, which is the origin of *Quwat-e-tabyaiya* (physical faculty). *Buqrat* said that most of our life depends on our healthy liver and being essential place for all metabolic activities<sup>[4]</sup>. Liver is a big mass of solidified

blood and has reddish colour, which produces *Rooh-e-tabai* (natural pneuma). It is the source of blood formation, and makes the chyle acceptable for the organs<sup>[5]</sup>. If liver becomes incapable to produce blood then other organs will not get sufficient nutrients and finally the organs get affected, and become weak. The main function of the liver is *Istehalah* (metabolism) through which it produces *Hararat-e-ghareeziyah* (innate heat of the body) and *Akhlat* (humors) for the body<sup>[6]</sup>.

Diseases of liver developed due to *Su-e-mizaj* (an abnormal temperament), *Su-e-tarkeeb* (structural deformity), *Tafarruq-e- itsal* (discontinuity), *Waram* (Inflammation) and *Nafkhat* (collection of gaseous matter)<sup>[7,8]</sup>. Liver has five types of *Quwa* (powers), these are *Quwat-e-hazima* ((power of digestion), *Quwat-e-jaziba* (power of absorption) *Quwat-e-mumaiazah* (distinctive faculty) *Quwat-e-masika* ((power of retention) and *Quwat-e-dafeya* (power of excretion). If one or more than one *Quwat* of the above becomes weak, then diseases occur<sup>[9,10]</sup>.

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In all of these, *Quwaqt-e-mughaiyarah* (transformative faculty) is important faculties, because it takes formation of blood<sup>[9]</sup>. The weakness of function in the *Quwat-e-hazima* (digestive faculty) of liver results in production of *Damm-e-balghami* (blood containing excess phlem) and from which all the body organ get their nutrition and thus the whole body acquires *Balghami mizaj*, (phlegmatic temperament.) and leads to the abnormality of *Istisqa lahmi* (anasarca)<sup>[4]</sup>. *Istisqa lahmi* occurs due to dominancy of *Su-e-mizaj barid maddi* or *Gair maddi* (cold temperament which is associated with the matter or without matter.) of liver<sup>[9]</sup>.

*Su-e-mizaj* (an abnormal temperament) of liver arises from many causes such as diets or other environmental factors. Occasionally, the organ in vicinity of the liver also alters in its function, for instance, stomach does not properly produce good *Kailoos*, (chylus) and thus liver receives the same *Kailoos* leading to manifestation of *Barid mizaj* (cold temperament). In addition to weakness of spleen also plays an important role in the phenomena of *Barid mizaj* as it is unable to purify the blood from *Sauda* (*barid yabis*)<sup>[9]</sup>.

*Su-e-mizaj* (an abnormal temperament) of small intestine also predispose to *Su-e-mizaj Barid* (cold temperament) of liver. *Waram* (Inflammation) may also be accompanied with *Su-e-mizaj* of liver and also may be without it. But *Waram* is always in harder consistency, besides these causative factor *Su-e-mizaj* of liver may also result from *Maraz-e- murakkab* such as *Sudda* (obstruction) in liver as it reduces *Hararat-e-gariziya* particularly *Suddah barid*. Abnormality of *Quwat-e-hazima* predisposes to the pathogenesis of following diseases: *Istisqa tabali* (ascites succatus) and disease of *Mirrah safra* (serous bile). The production of *Safra* increases when *Su-e-mizaj haar* is developed in the liver<sup>[9]</sup>.

Most of the function of liver occurs due to the action of *Hararat-e-gariziya* (innate heat/natural heat). If *Su-e mizaj* exceeds from the normal limit it results in deviation from normal function of liver, in this condition when *Rutubat* (Moistness) comes in contact with this *Hararat* (hotness) it vaporise, resulting in the formation of *Riyah* (gases) and finally become responsible for *Marz Istisqa Tabali* (Collection of condensed gases or mixed fluid in the abdominal cavity)<sup>[9]</sup>.

The cause of *Su-e-mizaj* of liver which is particularly related to liver is dysfunction of gallbladder due to obstruction of bile duct or weakness of *Quwate dafiya* (excretory power). There are two causes of *Yaraqan*

(jaundice), either functioning of gall bladder disrupt or *Su-e-mizaj* developed in liver, such as in *Waram safrawi* of Jigar and due to uses of hot poison, this is the reason of excess synthesis of *Safra* which expose on external body. *Istisqa Zaqi* (ascites) and many other diseases developed due failure of *Quwat mumaiyeza*.<sup>[9]</sup> Many times, it is seen that disease develops due to only *zof-e-Jigar* (hepatic insufficiency) or *zof-e-jigar* along with *Waram sulab* (Chronic inflammation), *Abscess*, *Qarha* (Ulcer) *Suddah* (Obstruction), and *Ta'fun* (Infection),<sup>[10]</sup>

### Important diseases of the liver

*Su-e-mizaj jigar* (Abnormal temperament of liver), *Zoufe jigar* (hepatic insufficiency.), *Suddah jigar* (Hepatic obstruction), *wram-e-jigar* (hepatitis), *Dubaila-e-jigar* (liver abscess), *Hisat-e-jigar* (Cholilethiasis), *Su-al-qinia* (anaemia with hypoprotienemia), *Sigr-al-kabid* (hepatic atrophy), *Izam-al-Kabid* (hepatomegaly), *Istisqa* (ascitis), *Yaraqan* (jaundice)<sup>[11,12]</sup>.

### Clinical features of liver diseases<sup>[7]</sup>

*Qillate Ishteha* (loss of appetite), *Qaiy* (vomiting), *Bad-hazmi* (indigestion), *Bayaz shaftain wa lisan* (Appearance of whitish lips and tongue), *Zoafe aam* (General weakness of body), *Faqrudam* (Anaemia), *Safravi dast* (bilicious motion), *Baraze abyaz* (White faeces), *Humma* (Fever).

### Principles of treatment in diseases of liver

In the management of liver diseases, the treatment prescribed by Unani physicians on following pattern.

- Removal of the predisposing factors
- Correction of *Su-e-mizaj*
- Dietary management

Thus while managing the liver diseases, hepatic faculties have to be strengthened. Normalizing the unnatural *mizaj* of liver by suppress or motivating the innate heat through diet, drugs possessing *Mubarrid* (refrigerants) / *Musakkin* (calorifacient) property respectively, besides *Muattir* (aromatic), *Mohallil* (anti-inflammatory), *Mufatteh sudad* (deobstruent), *Qabiz* (astringent) and *Mushtahi* (appetizer) properties. Massage with cold/ hot oils over hepatic region, baths and suitable exercises are also recommended. According to Ibn Sina, all these measures which are part of *Ilaj bil zid* (counteractive treatment), if adopted may restore *Tabai mizaj* (natural temperament) of liver<sup>[13]</sup>.

If disease occurs due to *Su-e-mizaj* (abnormal temperament) of liver, it should be tried to restore its

temperament, such as in case of *Su-e Mizaj haar* (excess of heat) of liver, *Tabreed* (refrigerants) should be given and for this action, *Aab-e-Kasni*, *Sikanjabeen* (mixture of vinegar, lemon and sugar),<sup>[7,12]</sup> *Ussarah* Kaknaj (extract of *Physalis alkekengi*), *Ussarah* Mako (*Solanum nigrum*), *Ussarah* Tamar hindi (*Tamarindus indica*) and *Ussarah* Zarishk (*Berberis vulgaris*) are mentioned<sup>[8]</sup>.

If *Sudda-e-jigar* (obstruction of liver) develops with *Su-e-mizaj har*, then *Muftteh-sudad* (deobstruent) drugs such as *Karafs* (*Apium graveolans*) should be used with above drugs, because *karafs* has deobstruent property which removes all types of obstruction from liver (either concave or convex side), as well as *Qurse Tabasheer*, *Qurse Zarishk*, *Sharbate Nilofar*, like *Barid* (cold temperament) compound formulation are also efficient<sup>[7,8]</sup>.

In case of *Haar jigar* (excess heat of liver), *Zimad* ((liniments) of *Khurfa* (*portulaca oleracea*) along with *Roghan Gul*, *Sandalain* (both variety of Sandal), *Fofil* (*Areca catechu*), *Banafshah khushk* (*Viola odorata*), and *Gule Surkh* (*Rosa damascena*) are also helpful<sup>[8]</sup>.

In case of *Su-e Mizaj barid* (excess of coldness) of liver, which developed due to *Maddah* (matter), restoration and normalization of *Humours* (*Balgham and Sauda*) is done by *Nudj* (concoction) and *Tanqiya* (removal of abnormal humours) initially, then after correcting the *Mizaj* of liver with their respective drugs, for this purpose *Dawa-ul-kurkum* and others compound preparation which have hot ingredients such as *Sharbate Afsanteen*, *Qurse Afsanteen* along with *Sikanjabeen Unsoli* are effective<sup>[8,12]</sup>, as well as numerous *Mufrad* (single) drugs like *Sounf* (*Foeniculam vulgare*), *Tukhm Karafs* (*apium graveolans*), *Mastagi* (*Pistacia lentiscus*), *Qust sheereen* (*saussurea lappa*), *Izkhar* (*Andropogan schoenanthus*) and *Ghafish* (*Argimonia eupatoria*) are also effective for *Barid Jigar* (excess coldness of liver).

*Zimad haar*, ointment prepared with hot temperament's drugs such as *Zimad Nakhona* (ointment of *Trigonella uncata*) and others *Zimad* which prepared with *Qust* (*Saussurea lappa*), *Sumbulut-teeb* (*Nardostachys jatamansi*), and *Waj* (*Acorus calamus*) along with rose flower should be applied locally on the skin over liver area, restored liver function<sup>[8,12]</sup>.

*Zofe Jigar* (hepatic insufficiency), which generally occurs due to *Barodat* (excess cold) and *Ratobat* (excess moisture), it should be treated with *Qabiz* (Astringent) and aromatic drugs like *Darchini* (*Cinnamomum*

*zeylanicum*), *Izkhar* (*Andropogan schoenanthus*), *Murmaki* (*commiphora myrrh*), *Zafran* (*Crocus sativus*) and other such type of drugs are also useful.<sup>[7,13]</sup>

Along this *Mjooon Dabeedul* ward, *Dawaul kurkum* like compound formulation are also useful in *Zofe Jigar* (weakness of liver).

For the management of *Sudda-e-jigar* (hepatic obstruction), obstruction remove with help of *Mufatteh sudad* (deobstruent), *Mohallil* (resolvent) drugs along with *Qabiz* (astringent) and aromatic drugs,<sup>[7]</sup> such as *Luk maghsool* (*Cocca lacca*), *Reward Chini* (*Cinnamomum zeylanicum*), *Ussarah Ghafish* (extract of *Argimonia eupatoria*), *Tukhm badiyan* (seed of *Foenicululum vulgare*), *Tukhm Bathuwa* (seed of *Chenapodium album*), *Afsanteen Romi* (*Artemisia absinthium*), *Tukhm Kasni* (seed of *Cichorium intybus*), *Tukhm Karafs* (seed of *Apium graveolans*) and *Tukhm Kasoo*s (*Cuscuta reflexa*) are used. In addition, *Joshanda* (decoction) of *Gul-e-Banafsha* (*viola odorata*), *Mako Khushk* (*Solanum nigrum*), *Biranjaisif* (*Achellea millefolium*), *Gao Zaban* (*Borage officinalis*) and *Habbe Kabid Naushadri* are also effective<sup>[7]</sup>.

If the disease is due to weakness of any one or all four faculty of liver (*Quwwate Hazima*, *Jaziba*, *Masika*, and *Dafiya*) then therapeutic management is aimed to strengthening that respective *Qawah*.

For the management of *Waram-e-Jigar* (Hepatitis) with abscess, *Mashroobat*, *Tela*, and *Zimaad* ((Liniments and ointments) are recommended for the purpose of *Nudj* (concoction) and *Talaiyin* (laxation)<sup>[7]</sup>.

In *Waram-e-Jigar*, if *Maddah* (matter) is present on the *Miqar Jigar* (concave side of the liver), then *Mushilat* (purgatives) and *Muhallilat* (resolvents) should be given, such as *Tukhm Kasni* (seeds of *Cichorium intybus*), *Bekh Kasni* (root of *Cichorium intybus*), *Mako Khushk* (*Solanum nigrum*), in the form of *joshanda* (decoction). If *Maddah* located on *Mohaddab-e-Jigar* (convex side of liver) then diuretics such as *Sikanjabeen* (mixture of vinegar, lemon and sugar) are quite effective. *Aab-e-Kasni* (*Cichorium intybus*water), *Aab-e-Mako* (*Solanum nigrum* water), *Sharbat-e-Anarain* (*Punica granatum*), *Parsiyaonshan* (*Adiantum pedatum*), *Asalassoos* (*Glycyrrhiza glabra*) etc may also be given<sup>[7,8,12,14]</sup>.

Generally *Yarqan* (jaundice) occurs due to *Waram-e-Haar* (acute hepatitis), *Waram-e-Muzmin* (chronic hepatitis), and *Sudda-e-Jigar* (hepatic obstruction). *Mushile safra* (bile's purgative) and deobstruent drugs

are used for Tanqiya-e-Jigar (to purifyng liver), with help of *Joshanda* (decoction) of Halelah (*Terminalia chebula*), Saqmuniya (*Convulvulus scammony*), Afsanteen (*Artemisia absinthium*) and Ayarij faiqra are also good<sup>[10]</sup>.

Tablets or pills which are prepare for liver disease should be in fine powders, and used along with suitable vehicle.<sup>[7]</sup>

#### Dietary management:

Diet plays an important role in the management of liver disorders. Both starvation and excessive food intake produces *Su-e-Mizaj Barid*, hence balanced food intake is recommended. Light and easily palatable diet should be prescribed for liver patients such as small bird's soup, chicken soup, pulses, sagodana ki kheer (Metroxylan sago gruel), Aabnakhud (Cicerarietinum), Daliya (wheat gruel), Kishneez (*Coriandrum sativum*), Pudina (*Mentha piperita*) etc.<sup>[14]</sup>

In *Yarqan* (Jaundice), restrict food which can produce *Suddah* and increase synthesis of *Safra* (bile) such as meat, and other fatty food. In this condition *Mako*, *Bathua*, *Muli*, *Shaljam*, *Chukanndar* are beneficial<sup>[15]</sup>.

#### CONCLUSION

This review shows that, the main function of the liver is *Istehalah* (metabolism) through which it produces *Hararat-e-Ghareeziyah* (Innate heat of the body) and *Akhlat* (humors) for the body. Most of the drugs which is used for hepatic diseases, possess the properties of *Mulattif* (demulcent), *Mufatteh* (deobstruent), *Mohallil* (resolvent), for these action many of drugs are found effective in various studies and scientifically proved for different pharmacological activities. Liver protective herbal drugs contain a variety of chemical constituents like phenols, coumarins, lignans, essential oil, monoterpenes, carotenoids, glycosides, flavonoids, organic acids, lipids, alkaloids and xanthone derivatives. It is reported that flavonoids and steroids may be responsible for hepatoprotective effect. Further, more phytochemical and pharmacological studies are needed.

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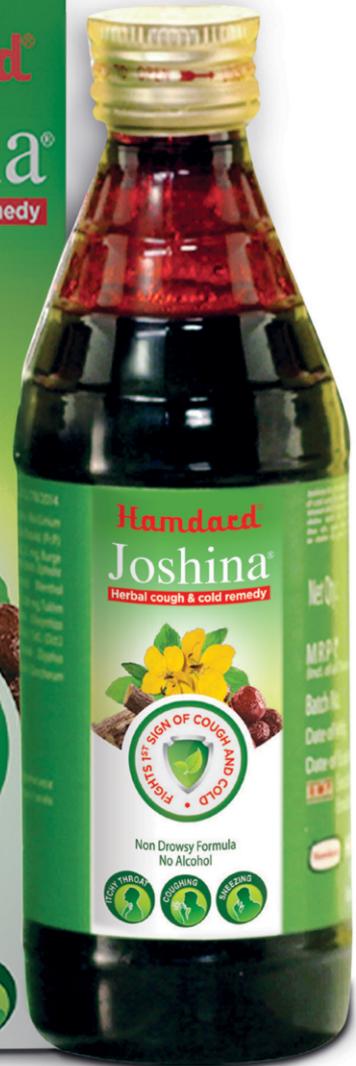






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