RELEVANCE OF UNANI MEDICINE IN THE MANAGEMENT OF DIABETES: A DESCRIPTIVE REVIEW

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Background: The endocrine disease with the largest global impact, diabetes mellitus, is the most well-known. Diabetes mellitus is coupled to some potentially fatal complications such as neuropathy, nephropathy, retinopathy, and cardiovascular issues. Hyperglycaemia can be treated using anti-hyperglycemic medications in conventional system. However because of certain severe side effects of these medications, people are turning to herbal solutions. Underneath the title of Dhyābitus, Unani medicines provide a detailed description of diabetes. Unani system has developed various single and poly-herbal medications for the treatment of diabetes with fewer side effects and more accessibility, making them preferable to synthetic medications for a chronic condition like diabetes mellitus.

Aim of the study: The aim of this study is to look into and identify significant traditional Unani oral hypoglycaemic measures for controlling diabetes.

Materials and Methods: In the current study, scientific data and review articles on the subject were gathered from Science Direct, Scopus, PubMed, Google Scholar, and other ancient Unani medical texts.

Results: The Quwat mughayyara (transformative faculty) weakening, renal insufficiency, Su' mizaj haar/barid kulliya (dystemperament of kidneys), and structural anomalies are responsible for its etiopathogenesis have been elucidated in classic books of Unani medicine. It has been revealed that a number of single and compound formulations have been tested through pre-clinical and clinical trials for their ability to treat diabetes.

Conclusion: This review covers several Unani poly-herbal formulations that are frequently used in the treatment of diabetes mellitus together with the results of their pre-clinical and clinical studies, which will advance the current understanding of researchers.

ABSTRACT

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Keywords: Unani Medicine, Diabetes, hyperglycaemia, poly-herbal.

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Introduction

Diabetes is a chronic clinical illness that develops when the body is unable to use insulin produced by the pancreas or when there is insufficient insulin synthesis (insulin is a hormone that regulates blood sugar or glucose). Since the year 1980, the prevalence of diabetes (age-standardized) in the adult population has increased by nearly twofold, from 4.7% to 8.5%. According to the International Diabetes Federation, assuming current trends continue, 693 million individuals aged 18 to 99 or 629 million people aged 20 to 79 would have diabetes by 2045. According to WHO statistics, diabetes was the seventh most common cause of death in 2016. In 2017, it is predicted that 4.0 (3.2-5.0) million people aged 20 to 79 will die from diabetes, which equates to one death every eight seconds and accounts for 10.7% of worldwide all-cause mortality, which is more than the sum of deaths from infectious diseases.

The worrisome trend is that diabetes strikes Indians on average ten years earlier than it does in the West. With over 983,000 deaths attributable to the disease in the next several years, diabetes is predicted to have a greater impact on India and become the main cause of regional mortality. As the disease is chronic and progressive in nature, it implicates substantial financial burden on the patient. As per a study, in India, the average annual expenditure by patients on diabetes care was INR 10,000 in urban areas and INR 6260 in rural areas, and as per another study the average annual direct cost was INR 8822. According to the WHO, low-income families with diabetes can spend up to 25% of income on diabetes care, leading to lost productive life years and financial burden. Some people with diabetes don't exhibit any symptoms, particularly those with type 2 diabetes in the early stages of the disease. However, people with severe hyperglycemia, particularly in young children with absolute insulin deficiency, can experience polydipsia, polyuria, polyphagia, weight loss, and blurring in vision. If untreated, diabetes can cause ketoacidosis or, less frequently, nonketotic hyperosmolar syndrome, which can cause stupor, coma, and death if not addressed. Long standing cases of diabetes mellitus is always associated with an increase in the prevalence of micro-vascular and macro-vascular diseases. Although the pathophysiology of diabetes is not yet well understood, evidences have suggested the impact of free radicals in the pathogenesis and development of diabetes.

There are now two main therapy modalities available for diabetic patients: conventional medication and complementary and alternative medicine. Depending on how complementary and alternative medicine is defined and how the study is set up, the prevalence of use in studies of diabetes patients using CAM ranges from 17% to 78%. Similarly, almost 60% of diabetics in India use complementary and alternative therapies. A study in Kerala, found that approximately 40% of patients with diabetes use CAM regularly, of which 30% used it along with modern medicines. One of the AYUSH systems of medicine, known as unani, is very well-liked by the general public. Unani medicine, also known as Greco-Arab medicine, is an old medical system that started in Greece and, broadly speaking, spans the period from 500 BC to 500 AD. According to tradition, Hippocrates, Dioscoridius, Aesculepius, Hygiea, Panacea, Aphrodite, Pan, Juno, Neptune, Mercury, Pluto, and Galen were all consecutive healers of all diseases.

Diabetes is discussed in classical Unani literature under the headings of Dulaab, Istisqa-e Amnas, Mo'attisha, Dawwarah, Barkariyyah, Zalaqul kulliya. Concerning the definition, it was remarked that the disorder of Dhayabitus is, which in that patient suffers from excessive thirst, and is highly associated with kidney function. The Eber's papyrus, which discusses treatments for frequent urination, is said to have been the first mention of diabetes mellitus. Nonetheless, there are several examples in the writings of the Greek physician Buqrat (Hippocrates) that are consistent with the symptoms and hallmarks of diabetes, despite the fact that he did not mention diabetes directly in his writing. There are some allusions to increased urination and bodily wasting. The term “diabetes” was first introduced in 1st or 2nd century BC by Demetrius of Apamia.

1.1 Understanding of Dhayabitus in view of Unani scholars

The importance of the study of diabetes was also realized by Unani scholars and it was discussed in detail by succeeding scholars especially by Rabban al-Tahri (d. 895 A.D.) in Firdaus al-Hikmat, Ali Ibn Abbas Majusi (930-994 A.D.) in Kamil-us-Sana'ah, etc. The discussion on diabetes is based mainly on the signs and symptoms. Presently, dhayabitus is the terminology used for diabetes, in general, and dhayabitus Shakari for diabetes mellitus. Ancient Unani scholars 20-25 had described diabetes by various terms like Dulaab, Istisqa-e-Amnas, Mo'attisha,
Dawwarah, Barkariyyah, Zalaqul kulliya, Ziyaqoos, Qarames etc. Dulaab (water-wheel) is a Persian word, which means the patient always feels thirsty and never seems to be quenched. Istisqa-e-Amnas is an Arabic word, which means, whatever fluids the patient consumes, collected almost immediately in the bladder just like Istisqa (Ascites). It is also known as Mo’attisha (Diapetic), which is derived from ‘atsh’ meaning thirst. The reason for this name is obvious. Diabetes is also known as dawwarah (rotating, revolving, whirling) and barkariyyah because the vicious cycle of intake and excretion of water seems to be unending.

The first reference to diabetes mellitus is attributed to the Eber’s papyrus that mentions remedies for the treatment of excessive urination. There are certain references to excessive urinary flow with wasting of the body.

Aretaeus of Cappadocia coined the term “diabetes” first time for a disease. It was derived from the Greek verb diabainein, itself derived the prefix dia-across, apart and the verb bainein-walk, stand. Diabetes is a disease characterized by the “too great emptying of the bladder just like barkariyyah” and leads to increased thirst, which this condition is termed as Istisqa-e-Amnas.

Ibne Sina provided a detailed account on diabetes mellitus in “Al Qanoon fil Tib, describing the clinical features of the disease with abnormal appetite. He noticed that when urine was allowed to stand in room temperature air, a sticky, honey-like residue remained. Diabetes-related problems have been linked to gangrene and a decline in sexual function. Diabetes can be either primary or secondary, and Ibne Sina noted that it subtly transforms into Zooban and Dig.

Ibne Zuhar described the disease as Illat’ Barkariyyah in his book Kitab’Al Taiseer. He quoted with reference to jalinas in his book that of dhayabīlus in two of his books Ala’aza al-alma” and Kitāb al-miyyar. Renal dyscrasia (Sūmizāj-i-kulya) being described the primary cause in his book “Ala’aza al-alma”. The other type narrated in the book “Kitāb al-miyyar” is caused by insufficiency/weakening of Quwa’ttemu ghayyira (transformative faculty).

Jamal-uddin, Aqsaarai has mentioned in Al-Aqsaarai that dhayabīlus may be caused due to dominancy of cold temperament.

Ismail Jurjani mentioned in his book Zakhira Khwarzam Shahi, that the dilatation and opening of the vessels of the kidneys cause dhayabīlus, therefore more absorption and excretion from the kidneys occur.

Ibn-Rushd mentioned in Kitabul Kulliyat that Illat’ barkar i.e., dhayabīlus should be designated towards harr temperamen and the primary cause lies when Quwwate Jaziba (Absorptive power) of liver get enhanced leading to excessive urination with excessive thirst, which this condition is termed as Barkan/Barkariyyah. However, increased Quwa’tte Jaziba causes ascites.

Burhanuddin Nafees has mentioned renal dysfunction, weakness, hot temperament and inflammation of the kidneys among the causative factors of diabetes. He has also mentioned cold temperament as a causative factor of diabetes, which weakens the Quwa’tte masika and leads to increased urine output.

Hakeem Ajmal Khan has mentioned in Haziq that renal dysfunction, weakness and abnormal hot temperament of kidneys, mental exertion is among the risk factors of diabetes. He classified Diabetes on the basis of presence or absence of sugar in urine.

Azam Khan has mentioned in Eksir-e-Aazam as Mo’attisha (Diapetic), Barkariyyah, Dulaabiya, Zalaq-e-kulliyah are the synonyms given by him. He stated it is a disease characterized by the “too great emptying of...
urine", where no essential part of drink is absorbed by the body. It is also known as Silsil al-Baul because as the disease advances, urgency of micturition also occurs, which is often not curable.25

1.2 Classification14-26,32
According to derangement in mizaj and intensity of symptoms, dhayabīṭus has been classified as:

1. Dhayabīṭus It is caused by sū‘mizaj ḥarr. This type of dhayabīṭus is characterized by intense thirst, polyuria, and emaciation.

2. Dhayabīṭus bārid – It is caused by sū‘mizaj bārid of the whole body or of the kidneys only. It is regarded as milder in nature. Polydipsia is present despite of sū‘mizaj bārid, though not as intense as in dhayabīṭus ḥarr.

According to the presence or absence of sugar in the urine, dhayabīṭus is further divided into two types:

- Dhayabīṭus sada: It is also known as dhayabīṭus ghair shakari. It is recognised by excessive thirst with excretion of tasteless, watery, light weighted, odourless and sugarless urine.93

- Dhayabīṭus shakari, it is characterized by excessive thirst and urination and presence of sugar in the urine. Due to the presence of sugar, the discharged urine is typically both bright and sharbati-colored and has a considerable attraction to ants and other insects.83,93

Many remedies have been employed throughout ages to treat diabetes. Most of these remedies are from plant sources and claimed to be beneficial. Although the rationale behind their use is not understood properly, except for few plants and their proprietary medicines, which reported to be effective and safe.26 It is now the time to investigate these drugs based on scientific rationale, given by Unani physician. The present paper aims to make the Unani concept of Diabetes clear and to gather out the most cited Unani classical text with its management within an integrated approach.

2. Methodology
An extensive search on most popular databases as Pubmed, Scopus, Science direct, and Google scholar were used to retrieve online literature. All references studies published in indexed journals were included. The Anti diabetic activities of reported herbs as well as concerned pharmacological actions searched from reputed journals. For Unani literature concerned collection was based on the analysis of remaining manuscripts of Unani text from 9th to 18th centuries AD involving medical and pharmaceutical textbooks of this period. The keywords used in classical books for search of literature with respect to this study are Dhayabīṭus”, “Unani Medicine”, “Diabetes”, “Hyperglycaemia”, “Polyherbal”.

<table>
<thead>
<tr>
<th>Table 1: Unani Classical manuscripts consulted for survey19-35</th>
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<tr>
<td><strong>Manuscript</strong></td>
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<tr>
<td>Kitab-Al-Hawi (Urdu Translation by CCRUM)</td>
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<td>Al Qanun fil’tibb (Canon of Medicine)</td>
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<td>Title</td>
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<tr>
<td>Kitab’al-taisir</td>
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<td>Tibb-i Akbar</td>
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<td>Eksir-e-Aazam</td>
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<td>Zakhra-i Khwârazm shâhi</td>
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<td>Haziq</td>
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<td>Jam ul hikmat</td>
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<td>Kamil-us-Sana’ah</td>
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Kitab a'l kulliyat  
(Book of generalities)  
Ibn Rushd  
(Averroes)  
12th century A.D.  

It is also known as ‘Colliget in Latin. The structure of the treatise was organised so as to produce a compendium of art of medicine and its foundation with treatment. It is started with anatomy, explanation of diseases with their sign and symptoms, and their preventive approach and lastly line of treatment mentioned. It consists of two treatises and divided into seven chapters. First chapter include anatomy and second health related issues, third disease related issues, fourth related to symptoms of disease, fifth related to drugs and diet, sixth explained preventive medicine, seventh describe usol-e ilaj.

RESULTS AND DISCUSSION

Diabetes can result in potentially catastrophic results such as neuropathy, nephropathy, retinopathy or other eye illnesses, cardiovascular issues, etc. Unani medicine thus addresses wide pathology and its management using its existing conceptual knowledge of traditional heritage. In Unani literature, Dhayabitus may result from a number of causes. The Etiopathogenesis of diabetes involves various factors:

- Structural abnormalities like dilatation of halibayn (ureters) or opening of capillaries of kidneys and urethra
- Du’af al-kulya (Renal insufficiency)
- Su’mizaj harr kulya wa kabid (kidneys and liver) This is said to be the basic cause of dhayabitus by Razi. These condition results in impairment in the Quwa’tte masika (retentive force) of kidneys causing inability to retain the fluids in the body and the Quwa’tte dafi’a (power of excretion) get stimulated thus forcing the fluids to expel immediately after intake. The type of dhayabitus emerging from this cause is more common.
- Su’mizaj barid kulya
- Su’mizaj barid kabid

- Su’ mizaj barid of the whole body:
- Dhayabitus caused by cold exposure has been deemed as the rarer variety. Jurjānī has mentioned four main causes of dhayabitus: Du’af al-kulya (renal insufficiency), Ittisā ‘Majrā-i-Bawl (dilatation of urethra), Su’mizaj harr kulya (renal dyscrasia towards hot temperament) or Su’mizaj hārid- either of the entire body or of the liver only.
- Insufficiency/ weakening of Quwwat mughayyira (transformative faculty) Quwwat mughayyira is amongst the four quwa tabiyya khadima (sub-serving powers of nutritive faculty) namely-Quwwat jadhiba, Quwwat masika, Quwwat mughayyira and Quwwat dafi‘a. Due to this, the physiological state and functions of liver are disordered. As a result due to weakness of Quwwat jadhiba (Absorptive faculty) liver get debilitated to absorb diet forcing body weak and lean.
- When deficit in Quwwat mughayyira emerge, it affects all four stages of digestion (Hudm arba‘a i.e. Hadm ula- in stomach, Hadm thani- in liver, Hadm uruqi- in vessels, Hadm ‘udwi- in organs) and therefore the food is not
digested and metabolized properly. These disordered processes result in a number of diseases like *Istesqa* (Ascites) and *Ilmat barkar* i.e. *dhayabitus* is included one of those diseases. All powers get affected due to weakness of *quwwat mughayyira* resulting in number of diseases. **22**

- *Ibn rushd* also quoted that *Ilmat barkar* (Dhayabitus) occurrence is due to weakness of *Quwwat masika*. As a result, Kidney’s are not able to procure nourishment from it as the usual intake of kidneys and inability of urine to stay in bladder. So patient feel intense urge to urinate and urine passed out without undergoing any change in urine. **27**

The complications mentioned as per *Ibne Sina*, that the diabetic patients develop *Diq* (phthiasis) and *Zooban-e-aza* (Emaciation of the body/cachexia) as a result of loss of body fluid **23**. According to *Razi* when duration of disease increases, patients develop *nahool* (emaciation) and *Huzal-e-shadeed* (Severe atrophy). *Azam Khan* mentioned in his book that it is a intimidating disease, if affects elderly people then it becomes fatal. **25** Therapeutic approaches for *dhayabitus* in Unani medicine can be broadly classified into three main categories.

**Dietary modifications**
Unani physicians clearly recommended a variety of foods for diabetics; *Amla* (Indian ghoose berry), unripe grapes juice, sour pomegranate, milk, fresh fish, Pears, dried fruits, goat milk, cheese with milk, fresh vegetables, barley water, oily extract of astringent fruits, and curd. Diet should be rich in *Mubarrid* (Coolant) and *Musakkin* (Sedative) food items. Incorporation of *Bārid* (Cold), *Qābiz* (Astringent) diet along with *Tabrad* (Refrigent) and *Taqwiyyat* (tonics) of kidneys should be initiated. **22-24,26**

**Tadabar (Regimen)**
*Ibne Sina* advised resting in cold environment. Sitting in cold water causes constriction in body and thereby quenches thirst and cools the kidneys and strengthen the vessels of kidneys **27**. Aromatisation with camphor and nilofer has been advised **27**. Application of *mukhaddir zimad* (Anaesthetic liniment) over the place of kidneys quenches thirst **21,22**. Mild enema after quenching of thirst is beneficial. Emesis causing *imala* of liquids or fluids towards mouth or by sweating should be encouraged so that excessive *ratabat* (moistness) is evacuated. **23**

**Ilaj bi’l dawa’ (Pharmacotherapy)**
*Rhazi* recommended usage of drugs with properties like *mussakkin’uašh* (thirst quenchers), *Mughalliz-i-dam* (inscippant to blood), *Mubarrid* (coolant/refrigent), *Muqawiyyat-i-kulliya* (renal tonics). Some *Harr* drugs are also used in Dhayabitus which act by their *Su rat-i-naẃ iyya*. *Mulayyinat* (laxatives) should be used for *talayyin-i-shikam*. **36,37**

**Single drugs**

**Compound formulations**
*Qurs gulnar, Qurs tabashir, Qurs kafur, Qurs dhayabitus, Dhulal dhayabitus, Qurs kushta Baiza murgh, Dolabi, Diabeat, Diabecon* and many more.
Table 2: Scientific studies on Compound formulations used in diabetes.

<table>
<thead>
<tr>
<th>S.N.O.</th>
<th>Compound formulation</th>
<th>Ingredients</th>
<th>Dose</th>
<th>Clinical study</th>
<th>References</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Qurs Tabasheer</td>
<td><em>Portulaca oleracea</em> (Tukhme Khurfa), <em>Rosa damascena</em> (Gule Surkh), <em>Punica granatum</em> (Gulnar), <em>Bambusa arundinacea</em> (Tabasheer), <em>Lactuca sativa</em> Linn (Tukhme Kahu)</td>
<td>2 tab BD</td>
<td>Improved glycemic control, pancreas protective and hepatoprotective effect by traditional polyherbal formulation “Qurs Tabasheer” in streptozotocin induced diabetic rats BMC Complementary and Alternative Medicine 2013; 13:10</td>
<td>40</td>
</tr>
<tr>
<td>3</td>
<td>Dolabi</td>
<td>Aqaqiya, banslochan, tukhm hammaz, gurmar booti, magz jamun, gond safaid, labba buz, kushta baize murg, kushta khubsul hadeed, kushta jas.</td>
<td>1 tab BD</td>
<td>Hypoglycemic Potential of Herbal Product Dolabi Compared with Pioglitazone in Streptozotocin-Induced Diabetic Rats</td>
<td>42</td>
</tr>
<tr>
<td>5</td>
<td>Diabecon</td>
<td><em>Balsamodendron mukul</em>, <em>Gymnema sylvestre</em>, <em>Pterocarpus marsupium</em>, <em>Glycyrrhiza glabra</em>, <em>Casearia esculenta</em>, <em>Eugenia jambolana</em>, <em>Asparagus racemosus</em>,</td>
<td>2 capsules BD</td>
<td>Hypoglycaemic effect.</td>
<td>44</td>
</tr>
</tbody>
</table>
4. Conclusion
Diabetes has spread around the world and now affects people of all ages, sexes, and ethnicities in recent times. Also, the frequency of its occurrences has been rising alarmingly every day. The synthetic conventional anti-diabetic drugs that are now on the marketplace have significant adverse reactions. As a result, a wide variety of traditionally touted Unani herbs have been utilised to treat diabetes and its complications, either alone or in the form of polyherbal combinations. The safety and efficacy profile of these Unani multi-drug formulations was proven through a number of preclinical and clinical trials. However, to meet the regulatory requirements for contemporary medicines, it is necessary to investigate the active ingredients and their molecular interactions.

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Conflicts of interest
There are no conflicts of interest.

REFERENCES


