

## DIABETES IN CONTEXT OF UNANI SYSTEM OF MEDICINE: A REVIEW STUDY

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Article Received on  
28 Feb. 2018,

Revised on 21 March 2018,  
Accepted on 10 April 2018,

DOI: 10.20959/wjpr201817-13433

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### ABSTRACT

Diabetes is an important public health problem globally. The comprehensive increase in the prevalence of diabetes is due to population growth, urbanization and increase in obesity and physical inactivity. As per the WHO, Diabetes is a heterogeneous metabolic disorder characterized by common features of chronic hyperglycemic with disturbance of carbohydrate, fat and protein metabolism. In classical Unani Literature, most of the Unani physicians have described Ziabetes or "Aldulab, Moattasha, Atsha, Intesae Anmas, Zalaqul Kulliyya, Dolab, Dawwarah, Barkar, Barkarya, Qaramees etc." with its number of Arabic vernaculars and defined Ziabetes symptomatically as characterized by excessive thirst and increased frequency of urination soon after taking fluid. *Ibn-e- Sina* stated in his

book of *Al Qanoon fit tib*, the word diabetes is derived from Greek word of *Diabanmo* which means to "passing through" or "run through" in reference to the excessive urine produced as a symptom of this disease. The causes of disease are *Su-e- Mizaj wa Zauf-e-Kulliyya wa Masana & Zauf-e-Jigar*. *Zakariya Razi* stated in his book *Kitabul Hawi*, dribbling of urine is the only

complaint of the disease because whatever enters to the bladder gets excreted immediately without being held. Classification according to the presence or absence of sugar in the urine as *Ziabetus Sada & Shakri* and according to *Khiffat* and *Shiddat* of the sign and symptoms *Ziabetus Haar & Baarid*. This review paper discusses about the Unani Concept of Diabetes from the Historical age to the Insulin era.

**KEYWORDS:** *Ziabetus*, Diabetes, Unani Concept of Diabetes.

## INTRODUCTION

Diabetes mellitus is common chronic disease in almost all countries & continues to rise in number globally due to an mature population, growth of population size, urbanization & high occurrence of obesity & sedentary lifestyle. The world occurrence of diabetes among adults (20-79 years) is 6.4%, affecting 285 million adults, in 2010 & will increase to 7.7% & 439 million adults by 2030. Between 2010 & 2030, there will be a 69% increase in numbers of adults with diabetes in developing countries and a 20% raise in developed countries.<sup>[1]</sup> The world Health Organization (WHO) has in recent times acknowledged that india has the maximum number of diabetic patients than any given country. India is thus the Diabetic Capital of the World.<sup>[2]</sup>

Diabetes was understood to be a disease of the urinary system by most of the Unani scholars. It was studied and predictable by many of the physicians including *Ibn Zuhar*, *Zakariyah Razi*, *Ibn Sina*, *Ibn Hubal Baghdadi*, *Jalinoos*, *Ibn Nafees*, *Jorjus bin Jibreel*, *Burhannuddin Nafees*, *Hakeem Azam Khan*, *Akbar Arzani*, *Ibn Abbas Majusi*, *Ahmad Al-Hasan Jurjani*, and lots of others. The study and researches were primarily based on sign & symptoms of the disease, and treatment was also directed towards the same. Unani Scholars have conceded out wide-ranging literary and clinical research into the sign & symptoms, & complications of diabetes.<sup>[3,4]</sup>

## LITERATURE REVIEW

The word “diabetes” comes from Latin “*diabētēs*”, which in turn comes from Ancient Greek word “*διαβήτης*” (*diabētēs*), which literally means “a passer through; a siphon.” Ancient Greek physician Aretaeus of Cappadocia (fl. 1<sup>st</sup> century CE) used that word, with the intended meaning “excessive discharge of urine,” as the name for the disease. Ultimately, the word comes from Greek “*διαβαίνειν*” (*diabainein*), means “to pass through,” which is composed of “*δια-*” (*dia-*), meaning “through” and “*βαίνειν*” (*bainein*), meaning “to go”. The

word “diabetes” is first recorded in English, in the form “*diabete*”, in a medical text written around 1425. The word “*mellitus*” comes from the classical Latin word “*mellītus*”, meaning “mellite” (i.e. sweetened with honey; honey-sweet). The Latin word comes from “*mell*”-, which comes from “*mel*”, meaning “honey; sweetness; pleasant thing,” and the suffix *-ītus*, whose meaning is the same as that of the English suffix “-ite.” It was Thomas Willis who in 1675 added “*mellitus*” to the word “diabetes” as a designation for the disease, when he noticed that the urine of a diabetic had a sweet taste (glycosuria). This sweet taste had been noticed in urine by the ancient Greeks, Chinese, Egyptians, Indians, and Persians.<sup>[5]</sup>

Among these works, *Maqala Fil-Baul* of *Rufs al-Afsi* (2<sup>nd</sup> cent.AD), *Kitab Fil-Baul* of *Hunain Ibn Is'haaq* (1188 AD) & *Kitab Ma'rfa Al -Baul* of *Is'haaq Bin Hunain* (828-911 AH), are worth mentioning.<sup>[3,4]</sup> In Persian & Arabic language, diabetes is known by various terms, which were principally based on its sign & symptoms. In Persian language, it is known as *Dulaab* (Water -wheel) because the patient always feels thirsty & never seems to be quenched. In Arabic language, it is known as *Istisqa-e-amnas* because whatever fluids the patient consumes, they are collected almost immediately in the bladder just like *Istisqa* (Ascites). It is also known as *Mo'attisha* (Dipsetic), which is derived from “*Atsh*” meaning thirst. The reason for this name is obvious. Diabetes is also known as *Dawwarah* (revolving, whirling) & *Barkarriyaah* because the vicious circle of intake & excretion of water seems to be unending. It is also known as *Silsil-Al-Baul* because, as the disease advances, urgency of micturition also occurs, which is often not curable. Apart from that, diabetes is also referred to as, *Zalaqul-kulliyah*, *Marz-e-Majari* & in some books. *Ibn Hubal Baghdadi* has referred to the disease by the names of *Ziabetus*, *Barkariyah*, *Dulabiya*, *Zalaq-e-Kulliyya* etc.<sup>[6,7,8]</sup>

According to *Ahmad al-Hasan Jurjani*, there are four main factors responsible for the causation of polyuria in *Ziabetus*: First, the weakness of the kidneys & their inability to retain the fluids in the body; second reason is the dilatation of the urethra, which is unable to stop the flow of urine; third abnormal cold temperament of Liver or Kidneys which may cause by exposer of cold ,e.g.in the form of cold drinking water; and fourth, it may cause due to hot temperament of the kidneys which causes them to absorb large amounts of fluids from the kidneys. In this condition the kidneys are not able to retain these excess fluids and they are excreted as such. He states that *Ziabetus* is a chronic disease, and diabetic is prone to develop *diq*.<sup>[9]</sup>

According to *Ibn Rushd* (1126-1198 AD), diabetes is caused due to increased *Quwwat-e-Jaziba* (power of absorption) of the kidneys. at the same time, the *Quwwat-e-Masika* (power of retention) is weakened, so that the water is excreted without undergoing metabolism. He was referred to the disease as *Silsil-al-Baul* (polyuria), *Barkan & Barkariyah*.<sup>[10]</sup>

*Zakariyah Razi* has quote *Jalinoos* statment in *Al-A'za-e-Alima* that *Ziabetus* (Diabetes) is similar in nature to *Zalaqul-Ama* (Lienteric diarrhea).<sup>[11]</sup>

*Jamal-Uddin Aqsarai* (1337 AD) has mentioned in *Al-aqsarai* that diabetes may be caused due to high proportion of cold temperament, which is accompany with decreased thirst, but this circumstance is very rare. Prolonged diabetes weakness the liver & causes general debility. This, accompanied by body also makes the patient exposed to *diq*.<sup>[12]</sup>

According to *Hakeem Azam Khan*, *diq* in this background refers not to the usual meaning of Tuberculosis, but it means that a patient of diabetes becomes very weak & asthenic & looks like an old person.<sup>[6]</sup>

According to *Burhanuddin Nafees* (d.1438 AD) he mentioned renal dysfunction, fault, Weakness, hot temperament and inflammation of the kidneys among the contributory factors of diabetes. He states that *diq* may be a complication of diabetes, which is caused due to abnormal excretion of fluids and leads to a state of dehydration.

*Burhanuddin Nafees* also mentioned cold temperament as a causative factor of diabetes which weakness the *Quwwat-e-Masika* (power of retention).

According to classical Unani literature, the underling pathology in *Ziabetus* is the *Su-e- Mizaj Haar* (abnormal hot temperament) of kidneys. This increased heat causes the kidneys to absorb excess amount of fluids from the body organs. The fluids from other parts of the body are also quickly diverted to the kidneys to neutralize this heat.

However, the *Quwwat-e-Masika* (power of retention) of kidneys is markedly weakened, and the fluids so absorbed are much larger in quantity than the capacity of the kidneys. Therefore, they are excreted as quickly as they are absorbed. This gives rise to the symptoms of *Silsil-al-Baul* (polyuria), polydipsia, and the urine is less gummy than normal.<sup>[13]</sup>

According to *Buqrat* (460-377 BC), this disease is frequently seen in middle aged males, and is usually fatal.<sup>[10]</sup> In addition, *Ibn Sina* has stated that this cycle of intake and excretion of fluid continues unendingly and steadily the whole body goes into a state of dehydration. This gives rise to extreme weakness. *Ibn Sina* has also described the signs & symptoms of diabetes in great detail. Among these, polyuria, polydipsia, erectile dysfunction, physical and mental weakness & gangrene are most prominent.<sup>[8]</sup>

*Ibn Nafees* (1210-1288 AD) has mentioned in *Shrah Mojez* that in diabetes, the fluids are excreted within a short time, without undergoing any change. This is due to excess hot temperament of the kidneys. He states “The *Quwwat-e-Masika* (power of retention) of the kidneys is weakened due to the abnormal hot temperament, therefore, they are not capable to retain the fluids in the body and the *Quwwat-e-Dafia* (power of excretion) is moved and it expels the fluids without delay after intake. Thus, the cycle of absorption (into the kidneys) and excretion continues”. On this basis, it has been named *Dulaab* (water -wheel) and *Dawwarah* etc.<sup>[14]</sup>

*Zakariya Razi* has quoted Sorabeun (death 864 AD) in *Al-Hawi Fil-Tibb* that diabetes is caused due to the weakness of the bladder muscles and *Quwwat-e-Masika*. The intensity of thirst also increases, and the fluids are readily excreted via urine, due to abnormal hot temperament of kidneys. Afterward, muscles may get paralyzed, resulting in incontinence of urine & feces. In this stage, obstruction of the urethra may also be seen.<sup>[11]</sup>

According to *Jorjus* (769 AD) diabetes is one of the diseases, which are seen rarely. In facts, he claims to have seen only two patients of the disease in his life time. Also, he states, the incontinence of urine and feces in this disease is due to the paralysis of bladder and rectal muscles which is one of the complications of diabetes.<sup>[11]</sup>

In his book *Al-Aza-e-Alima*, *Jalinoos* has stated that *Diabetush* (*Ziabetus*) is caused due to highly increased *Quwwat-e-Jaziba* (power of absorption) of the kidneys. Therefore, the kidneys absorb huge amounts of fluids from the liver. The liver in turn, derives these fluids from the intestine & stomach. This leads to dryness in the stomach and the patient feels intense thirst. In some cases, the muscles of the bladder and anus may also be paralyzed in this disease. This leads to incontinence of urine and stool. Sometimes, the urethra may get obstructed in such patient. Therefore, *Jalinoos* has suggested that the systemic examination of diabetic patient should be carried out properly.<sup>[11]</sup>

*Ibn-e-Zuhar* added a new aspect to the concept of *Ziabetus*, that it may be caused due to abnormality of any of the four temperaments. When diabetes is caused due to hot temperament with the presence of dryness, the symptoms are very severe. When it is caused due to cold temperament along with moisture, then polydipsia (*Kasrat-e-Atesh*) is not seen.

The urine is of low specific gravity and light in color. If the diabetes is due to cold temperament along with the presence of dryness, the disease is fatal one and it is a sign that the patient is nearing death. In this case, the patient suffers from severe physical and mental weakness, but the thirst is comparatively very low.<sup>[15]</sup>

Thus it is clear that *Ibn-e-Zuhar* could distinguish between the mild and lethal forms of diabetes. This is a notable observation, given the fact that the exact cause of diabetes was not yet known.<sup>[15]</sup>

Afterward, there was also a growing awareness that diabetes involves the whole body instead of kidneys only. In *Shrah Al-Mojez*, *Allama Sadeed-U-Ddin* has mentioned that abnormal hot temperament, with or without involvement of *Madda* (matter) is the causative factor of diabetes. This observation of *Allama Sadeed-U-Ddin* is proof that he was aware that diabetes may engage some other system of the body along with kidneys. However, this does not imply that he was entirely attentive of the nature of diabetes. Also the observation of earlier physicians demonstrates detailed information of the symptoms and complications of diabetes, including the renal pathophysiology in the disease process.<sup>[14]</sup>

### Periodical Outlook of Diabetes

	Date	Event
1	1530 BC	Ebers Papyrus, Egypt – first mention of polyuria
2	100 AD	Aretaeus of Cappadocia – first accurate description of the disease and coined the term ‘diabetes’ (from the Greek ‘diabainein’).
3	980-1037 AD	<i>Ibn Sina</i> (Avicenna)–description of sweetness of urine, the abnormal appetite and collapse of the sexual functions, and diabetic gangrene
4	6th-7 <sup>th</sup> Century	Susruta of India – first clinical diagnosis of diabetes (date of Occurrence under debate).
5	1675 AD	Thomas Willis – added the word ‘mellitus’ (from the Latin of honey) to refer to the sweet taste of urine.
6	1776 AD	Matthew Dobson – confirmed that sugar was present in both the urine and blood of diabetic individuals
7	1776 AD	Thomas Cawley – discovered correlation between shriveled pancreas and diabetic individuals.
8	Early 18th	Claude Bernard – hypothesized that glycogen was stored, by the liver and secreted as a sugary substance into the blood. Over production of glucose



	Century	was considered to be the cause of diabetes.
9	1864 AD	Marchall de Calvi in France who recognized peripheral neuropathy
10	1889 AD	Joseph Von Mering and Oscar Minkowski – discovered that the removal of a pancreas from a dog led to diabetes.
11	1893 AD	Gustave-Edouard Laguesse – suggested that pancreatic islet cells were involved in diabetes, and named them the Islets of Langerhans.
12	1894 AD	Moses Barron – linked damaged Islets of Langerhans to the cause of diabetes, and surmised that the substance from these cells was the treatment for diabetes.
13	1910 AD	Edward Albert Sharpey-Schafer and Jean de Meyer –named the substance insulin.
14	1923 AD	Frederick Banting and John Macleod – win Nobel Prize for the discovery of insulin and production of insulin injections.
15	1977 AD	Herbert Boyer genetically engineered synthetic human insulin
16	20th century	Davies-Pryce, a surgeon working in Nottingham, England, was the first to recognize the link between diabetic neuropathy and foot ulceration.

### Pathophysiology of Diabetes in Unani System of Medicine

Liver perform the great job of changing the chyme into blood. This function can't be performed by liver without water, because water is mixed with the chyme, make into liquid and able to penetrate in the narrow path of the canaliculi of liver. When the *Nuzj* of the chylous matter completes, then it produces some "*fuzla*" which it has to be excreted out. During the process of *nuzj*, liver produces three types of "*fuzlat*", one is "*Raghwah*" i.e. "foam" which is absorbed by the gall bladder, second is "*telchat*" i.e. argols, which is absorbed by the spleen, and for absorption of these matters liver assists them. And third is *bol* (urine), in the same manner liver assist the kidneys for butteriness of the blood and after that watery part is left for the elimination as urine.<sup>[16,17]</sup>

*Hakeem Ghulam Hasneen Sahib* wrote in his book of *Kamilus Sana'ah* that "*Ziabetus*" is also known as "*Perkariya*". The patient suffering from the disease goes for frequent micturition. It is also called as incontinence. The disease develops due to excessiveness of force of absorption by which kidney separate watery fluid from blood. The kidney increases its affinity towards fluid. The main cause of the disease is *Sue Mizaj Garam*, which predominate in both kidney and to reduce this excessive heat kidneys get attracted towards the fluid in blood. The fluid absorbed by the kidney is from liver and other vital organs, then it consequently causes excessive thirst, hence the entire organ gets attracted towards water. Besides the *Quwwqat-e- Masika* (retention power) of kidney becomes weak and unable to hold fluid. The amount of fluid which is absorbed by the kidney is too large to be held by the *Quwwat-e-Masika* of kidneys.<sup>[18]</sup>

The modern writer *Dawud Bin Umar Antaki* describes the term “*Ziabatus*”, is a Greek term means waterwheel; it is a condition in which hindering to the functions of kidney and liver involving the water management. Hence, the water will be passed out as drunken, like the meal comes out diarrhoea. Its cause is surplus heat which incapacitates the organs of water management. Possibly, there will be weight lose due to this. Clinical Features includes, excessive water intake without quenching, emaciation, skin colour change. Heat will be felt in the right -if the pathology is in the Liver.<sup>[19]</sup>

### Causes of Diabetes (*Asbab-e-Ziabetus*)

1. *Sue-e-Mizaj Haar* of kidney.<sup>[17,21,22]</sup>
2. Weakness of *Quwat-e-Masika* of kidney.<sup>[21,22]</sup>
3. *Zof-e-Gurda*: Kidneys unable to metabolize the absorbed water.<sup>[17,22]</sup>
4. Dilatation of vessels- unable to hold water for certain period for metabolism in kidney.<sup>[18]</sup>
5. *Sue-e-Mizaj-e-Barid* of kidney or whole body, absorbs more water and excrete easily without metabolism.<sup>[18]</sup>
6. Intense *Hararat*, which causes excessive absorption from liver which in turn absorbs from kidneys.<sup>[18]</sup>

### Signs and Symptoms of Diabetes (*Alamat-e-Ziabetus*)

1. Unquenchable thirst- Polydipsia without any sign of dryness of fever (Tapp).<sup>[22]</sup>
2. Frequent and excessive micturition without any burning sensation.<sup>[22]</sup>
3. Dry skin<sup>[20]</sup>, Skin color changes.<sup>[19]</sup>
4. General weakness of body due to impairment of liver function.<sup>[20]</sup>
5. General debility, emaciation.<sup>[19]</sup>
6. Weight loss.<sup>[19]</sup>
7. If duration of ailment increases patient become weak and lethargic.<sup>[22]</sup>
8. Evacuation of vital body fluid leads to *Yaboosat (Dryness)* and develop unquenchable thirst.<sup>[12]</sup>
9. Urine excreted is dilute, whitish and more watery like.<sup>[16]</sup>

### Pathogenesis of Diabetes (*Mahiyat-e-Marzi*)

According to *Ibn Hubal Bagdadi*, development of abnormally extreme hotness in *Mizaj* (temperament) of kidneys is the prime cause of this disease. They absorbs excessive amount of water to extinguish the hottest temperament, but fail to accommodate this superfluous amount of water and release it frequently as urine. This cycle of overly absorption and



excretion continues perpetually, other body fluid also starts evacuating with excessive urine, leading to *Yaboosat* and development of unquenchable thirst associated with dry and parched lips, which hardly ever get moist.<sup>[16]</sup> According to *Mohammad Bin Zakariya Al-Razi*, the absolute cause of this disease is *Sue-Mizaj Haar* (abnormal hot temperament). Kidneys develop fiery hot temperament and thus absorb insurmountable quantity of water. Overload with water, the kidneys begin to excrete this superfluous amount of water in the form of large volumes of urine. Once unloaded and relieved, the kidneys start filling themselves up again. *Su-e-Mizaj Haar* weakens the *Quwat-e- Masika* (retention power) of kidney in this disease and hence, *Mubarridat* and *Kafoor* form the mainstay of the treatment, if *Ziabetus* lapses into protracted, it causes severe debility and wasting of the body.<sup>[21,22]</sup>

### Complications of Diabetes

Complication of *Ziabetus* is specially enumerated by *Ismail Jurjani & Ibn-e-sina* as follows:

1. Frequent micturition without metabolism of water- weaken the kidneys and causes weakness of liver.<sup>[16, 19]</sup>
2. Severe debility and wasting of body.<sup>[18]</sup>
3. Sexual problems & Weight loss.<sup>[19]</sup>
4. In long standing the disease will develop into *Diq* and *Zooban* (melting). Unani physicians have described this *Zooban* that of melting ice.<sup>[18]</sup>
5. Neuropathy.
6. Acute complications are Diabetic ketoacidosis, Non ketosis hyperosmolar coma, Hypoglycemia.
7. Chronic Complications are Macro vascular complications (Coronary Artery disease and Stroke, Peripheral Vascular disease) & Micro Vascular Complications (Diabetic Retinopathy, Diabetic Nephropathy, Peripheral Neuropathy, Autonomic Neuropathies.).

### Treatment (*Ilaj*)

According to Unani physicians, the drugs, which correct the *Mizaj* (temperament) of kidney and liver or restore the *Quwwat-e-Mashika* (retention power) of kidney, are used to manage “*Ziabetus Haar*” (Diabetes Mellitus).<sup>[16,21,22]</sup>

### CONCLUSION

It is evident from the literature review that Diabetes was a crucial topic of talk in classical Unani text. There is very beneficial treatment or prophylaxis of *Ziabetus* in Unani text. In the

previous period, Diabetes was thought to be caused due to weakness of the kidneys, as it usually presented with polyuria. However, the later scholars meditate that diabetes may also involve some other structure of the body along with kidneys. Also there was separation between the mild and severe forms of the disease. This is evidence that the Unani scholars were very much conscious about the disease. In our Unani classical text there are many single & compound formulations are found to be beneficial in Pre Diabetic & Diabetic.

## ACKNOWLEDGEMENT

The Authors duly acknowledge the coordination and cooperation extended by Assistant Director In charge, HOD of Moalijat and the library staff of Central library, Regional Research Institute of Unani Medicine, Srinagar, in collecting the literature pertaining to the manuscript, authors whose references quoted and the journal reviewers for pointing out certain discrepancies. There is no any conflict of Interest.

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