

## Unveiling Renal Glycosuria: A Case Study Integrating Conventional and Unani Medicine Approaches

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### ABSTRACT:

A male patient of 60 years of age presented with chief complaints of Chronic Obstructive Pulmonary Disease (COPD) at the OPD of Ajmal Khan Tibbiya College Hospital, without any past-history of diabetes, TB, or other systemic illnesses. The patient underwent clinical examination and routine investigations, including urine analysis and blood tests. Urine analysis revealed unexpected glycosuria (glucose positive) despite normal blood glucose levels (80mg/dl). Other parameters were within normal limits, except for mildly elevated ALP (176 IU/L). The diagnosis of renal glycosuria was established after ruling out systemic causes. This case highlights the importance of a comprehensive, multidisciplinary approach in understanding and managing renal glycosuria. Integrating insights from conventional and Unani Medicine systems can offer patients a broader range of diagnostic perspectives, promoting holistic care and monitoring of kidney health.

**KEY WORDS:** Renal Glycosuria, Familial Glycosuria, Unani Medicine.

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### Quick Response Code



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**INTRODUCTION:**

Renal glycosuria is a rare condition characterized by the excretion of glucose in the urine in detectable amount, in normoglycaemic state <sup>[1]</sup>. This condition results from impaired renal tubular reabsorption of glucose, leading to its unnecessary loss in the urine. Renal glycosuria can be either inherited, typically as an autosomal dominant trait, or acquired due to factors like pregnancy, specific medications, or exposure to heavy metals. <sup>[2]</sup> Clinical presentation usually asymptomatic glucosuria, identified incidentally during routine urine analysis. Thus, physicians may misdiagnose the condition. In one of the reported case due to misdiagnosis it is treated for diabetes mellitus that leads to hypoglycaemia and hospitalization of that patient <sup>[3]</sup>.

There is currently no epidemiological data on the incidence of renal glycosuria due to its rarity, and until now, no cases have been reported in this region. We hereby document the first case of renal glycosuria in our region. Glycosuria is considered as "Sugar in urine" in Unani literature <sup>[4]</sup>. Ibne Sina compiled an exhaustive medical text "*Alqanoon Fil Tibb*", which included a detailed description of diabetes. Its clinical characteristic, that is sweet urine <sup>[5]</sup>. Galen (131–201 A.D.) explained diabetes as "diarrhea urinosa," describing it as a kidney-specific condition caused by a weakness in the kidneys' ability to retain fluids. <sup>[6]</sup> According to Unani physicians, clinical features includes an increased frequency of urination, often attract ants and flies to the urine<sup>[7]</sup>.

**CASE REPORT:**

A 60 years old male came in the OPD of Ajmal Khan Tibbiya College and Hospital, AMU, Aligarh with the complains of fever, cough with expectoration. He also

complained of body ache, head ache and generalized weakness. He was apparently well before the development of above-mentioned signs and symptoms. He relied on (OTC) Over-the-counter drugs for symptomatic relief and did not have any other medicine or treatment in the recent past.

He had no past history of Diabetes Mellitus., T.B, renal or any other systemic as well as surgical illness. Patient referred for diagnostic testing, including urine and blood investigations, at the Central Pathology Laboratory of Ajmal Khan Tibbiya College and its associated hospital. On repeated screening, no laboratory findings are which are abnormal, except for the glucose (4+) in urine were seen. The detailed investigations are discussed below.

**Blood Biochemistry**

The fasting blood sugar were 86 mg/dl respectively. The markers of kidney function, serum urea and creatinine were 20.0 mg/dl and 0.65 mg/dl respectively. The serum total bilirubin is 0.7mg/dl, direct and indirect bilirubin were 0.4 mg/dl and 0.3 mg/dl respectively. The serum concentrations of liver enzymes, SGOT, SGPT 38 IU/L and 19 IU/L and alkaline phosphatase (ALP) were 176 IU/L respectively. Thus, blood biochemistry revealed no abnormal glucose levels and hepatic and renal dysfunctions as well shown in Table-1.

**Haematological Parameters**

The haemoglobin (Hb) level was 13.4 gm/dl (reference range in male 14-18 gm/dl). The total leucocytes count was 11360/mm<sup>3</sup>, while neutrophil 71.6%, lymphocyte 19.2%, eosinophil 2% and monocyte 9.2% respectively whereas the platelet count was 234,000/mm<sup>3</sup>. (Table:-2) These values suggest that patient is not anaemic, and also no blood disorders were present.

**Urine Analysis**

The urine colour was pale yellow with clear transparency (**Figure-1**) and acidic in pH. There was no detectable amount of albumin and pus cells were (2-3 HPF), epithelial cells

(3-4 HPF), RBC (nil), cast (nil) and crystal (nil), all within normal levels. However, examination revealed the presence of glucose at a level of (4+ ) (**Figure 2**), with no other pathologies detected

**Table-1: Result of serum sample of patient: Blood Sugar, Kidney function markers and liver function parameters**

Parameters	Result	Reference Range (Units)
<b>Blood Sugar (F)</b>	86 mg/dl	75-115 mg/dl
<b>urea</b>	20.0 mg/dl	15-40 mg/dl
<b>Creatinine</b>	0.65 mg/dl	0.6-1.2 mg/dl (Male) 0.5-0.9 mg/dl (Female)
<b>Total Bilirubin</b>	0.7mg/dl	0.2-1.0 mg/dl
<b>a) Direct</b>	0.4 mg/dl	0.1-0.4 mg/dl
<b>b) Indirect</b>	0.3 mg/dl	0.1-0.7 mg/dl
<b>SGOT</b>	38 IU/L	8-40 IU/L
<b>SGPT</b>	19 IU/L	5-35 IU/L
<b>ALP</b>	176 IU/L	151-471 IU/L (Children) 60-170 IU/L (Adult)

**Table-2: Patient blood investigation report Haemogram/CBC**

Parameters	Result	Reference Range (Units)
<b>Haemoglobin (Hb)</b>	13.4 gm/dl	14-18 gm/dl (Male) 11.5-16.5 g/dl (Female)
<b>TLC</b>	11360/mm <sup>3</sup>	4000-11000/mm <sup>3</sup>
<b>DLC</b>		
<b>Neutrophil</b>	71.6%	40-60%
<b>Lymphocytes</b>	19.2%	20-45%
<b>Eosinophil</b>	2%	1-4 %
<b>Monocytes</b>	9.2%	2-10%
<b>Platelet count</b>	234,000 Lac/mm <sup>3</sup>	1.5-4.5 Lac/mm <sup>3</sup>



**Figure-1: Urine sample, clear and transparent.**



**Figure- 2: Urine dipstick results: Glucose (+4).**

## DISCUSSION:

Renal glycosuria is an uncommon condition, and we present a case involving a 60-year-old male. Other abnormalities were excluded, as there were no signs or symptoms of proximal tubular dysfunction. The man maintained a normal diet and engaged in his usual activities. Previous cases have shown that this condition does not have specific associated symptoms.<sup>[8,9]</sup> Under normal conditions, the proximal tubules reabsorb all glucose via SGLTs, preventing its presence in the urine.<sup>[10]</sup>

In this case, we excluded any kidney diseases, including proximal tubular dysfunction, by assessing urinary albumin levels and conducting urine microscopy. The individual exhibited normal liver function, as evidenced by liver enzyme and bilirubin levels. His hemoglobin levels were also within the normal range. In individuals with renal glycosuria, the renal threshold for glucose is lowered due to a defect in the SGLT2 transporter. Due to resource limitations, we

were unable to identify the mutation in this case.<sup>[11]</sup>

Further genetic testing in this patient is essential to identify the mutation associated with the condition. Additionally, screening of other family members is advisable. Since cases of renal glycosuria are often asymptomatic, this condition may be prevalent in the community, and it is crucial for physicians to be aware of it. If healthcare professionals are not adequately trained and informed, renal glycosuria could be mistakenly diagnosed as type 2 diabetes. Early diagnosis is important to avoid unnecessary economic burdens and the risks associated with inappropriate medications. Future studies should focus on screening for glycosuria in the population of this region. Also for proper diagnosis of familial renal glycosuria; Diabetes Mellitus, Fanconi syndrome (amino aciduria, phosphaturia, bicarbonaturia, cystinuria, proteinuria), pregnancy, drug history and acute tubular necrosis should be consider in differential diagnosis<sup>[12]</sup>.

## CONCLUSION:

India, often referred to as the "Diabetes Capital" of the world with 41 million individuals affected, contributing in the prevalence of type 2 diabetes, globally. It is crucial to recognize that misdiagnosis of diabetes mellitus through glycosuria may lead to potentially dangerous hypoglycaemic episodes. This situation underscores the need to identify renal glycosuria in patients who present with isolated glycosuria but have normal blood glucose levels. From a view of contemporary medicine, renal glycosuria is considered a benign condition that generally requires minimal intervention, primarily focusing on monitoring.

In contrast, Unani Medicine adopts a holistic approach, emphasizing the balance of bodily humors through herbal treatments, lifestyle adjustments and dietary changes. By integrating modern diagnostic techniques with Unani therapies, a comprehensive framework can be established for managing renal glycosuria, enhancing patient well-being from both a physical and holistic perspective.

## Declaration of patient consent:

The authors confirm that they have obtained all necessary patient consent for the use of clinical information in the journal. The patient understands that his name and initials will not be published, and efforts will be made to conceal his identity.

## Limitations of study:

1. **Lack of Genetic Testing:** Resource limitations prevented genetic testing to identify specific mutations associated with renal glycosuria.
2. **Rare Case Report:** The findings are based on a single case further studies are needed to understand the broader implications in the study population.

3. **Lack of Follow-up:** Long-term follow-up to monitor the patient's condition and any potential complications was not included.
4. **Unavailability of Epidemiological Data:** No comparative data on the prevalence of renal glycosuria in the region hampers broader conclusions.

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