

Case Report

Case Report: Black Urine Related to Diabetes

Shaoqi Han¹, Jing Tu² and Yifei Chen^{2*}

¹Dalian Medical University, Dalian, China

²Department of Emergency, Affiliated Hospital of Yangzhou University, China

Abstract

Rationale: Diabetes is one of the most common diseases and is a severe threat to public health worldwide. Long-term chronic hyperglycemia can cause multisystem injuries, such as chronic progressive diseases, hypofunction, and failure of the eyes, nerves, cardiac system, and blood vessels. It can also cause acute severe metabolic disorders such as Diabetic Ketoacidosis (DKA) and hypertonic hyperglycemic syndrome. Although not always the case, diabetes management is currently unsatisfactory. As a basic disease, diabetes may be accompanied by many other diseases and rare clinical manifestations.

Patient concerns: A 73-year-old woman presented to the emergency department was found to have DKA. This led to Rhabdomyolysis, with black urine, hyperkalemia, and high creatine kinase isoenzyme levels.

Diagnosis: The patient was diagnosed with Rhabdomyolysis and type 2 diabetes based on a history of type 2 diabetes, black urine, hyperkalemia, and high creatine kinase isoenzyme levels.

Intervention: The patient was treated with massive fluid rehydration, alkalinized urine, protection of kidney function, and the prevention and treatment of other complications.

Outcome: This patient was in a critical condition and her family members gave up finally.

Conclusions: Diabetes should be given sufficient attention, early diagnosis, and early treatment.

Keywords: Black urine; Diabetes; Rhabdomyolysis; DKA

Introduction

Diabetes can cause severe metabolic disorder like DKA and hypertonic hyperglycemic syndrome. Persistent hyperglycemia state leads to infect and other uncontrollable complications. And it is worthy thinking about how to prevent and cure complications of diabetes.

Case Presentation

A 73-year-old women with Type-2 diabetes and history of esophageal tumor surgery presented to the Emergency department with 11-hour history of disturbance of consciousness. On examination, the temperature was 38.3°C, the pulse 81 beats per minute, the respiratory rate 25 breaths per minute and the blood pressure 78/45 mmHg. The breath smelt of rotten apples. Tentative diagnosis was DKA and septic shock.

At 1:00 PM. On the day of admission, there was black urine from her catheter (Figure 1). On examination of urinalysis, the glucose was 3+, the protein 2+, the ketone bodies 1+, the occult blood 3+. And urine culture revealed gram-positive bacilli. The white-cell count was 9.58×10^9 per liter (reference range, 3.5 to 9.5), C-reactive protein 86.6 microgram per liter (reference range, 0.1 to 8.2), Creatine kinase

isoenzyme 34 unit per liter (reference range, 0 to 16), kalium 6.3 mmol per liter. Adequate rehydration and insulin were administered. 4 hours later, there was black urine again. Urinalysis this time showed the glucose \pm , the protein 2+, the occult blood 1+. Microscopic exam showed red blood cell 3-6/HP, white blood cell 4+/HP. 13 hours later, the urine of this patient became red. This patient was in a critical condition and her family members gave up finally. Black urine has been rarely reported in diabetic patients and it might be a point of concern.

Discussion

Black discoloration of the urine may be attributed to several reasons such as rhabdomyolysis, alkaptonuria, intravascular hemolysis, metastatic melanoma, porphyria, and severe hematuria and have medicines.

Alkaptonuria is a metabolic disorder of autosomal recessive inheritance caused by a deficiency of homogentisate dioxygenase [1,2]. The urine would turn to black when being exposed to air because of melanin produced by auto-oxidation [2,3]. In this case, the urine was black without being exposed to air, showed no indication of alkaptonuria.

Metastatic melanoma is the most aggressive and obstinate skin cancer with poor prognosis [4]. It occurs mostly in the skin, but also in the mucosa, eye uvea, pia meninges and other parts. And black urine, black pleural effusion and diffuse melanosis cutis are rare presentations of late stage of metastatic melanoma [5]. This patient didn't have any pigmentation other than black urine, which made it seem less likely to be metastatic melanoma.

Porphyria is a metabolic disease with defective activity of specific enzymes in the heme biosynthetic pathway. It leads to accumulation of pathway intermediates and then causes bellyache, light sensitivity,

Citation: Han S, Tu J, Chen Y. Case Report: Black Urine Related to Diabetes. World J Clin Case Rep Case Ser. 2022;2(1):1009.

Copyright: © 2022 Shaoqi Han

Publisher Name: Medtext Publications LLC

Manuscript compiled: Nov 7th, 2022

***Corresponding author:** Yifei Chen, Department of Emergency, Affiliated Hospital of Yangzhou University, Yangzhou, China, E-mail: 1979chenyifei@163.com

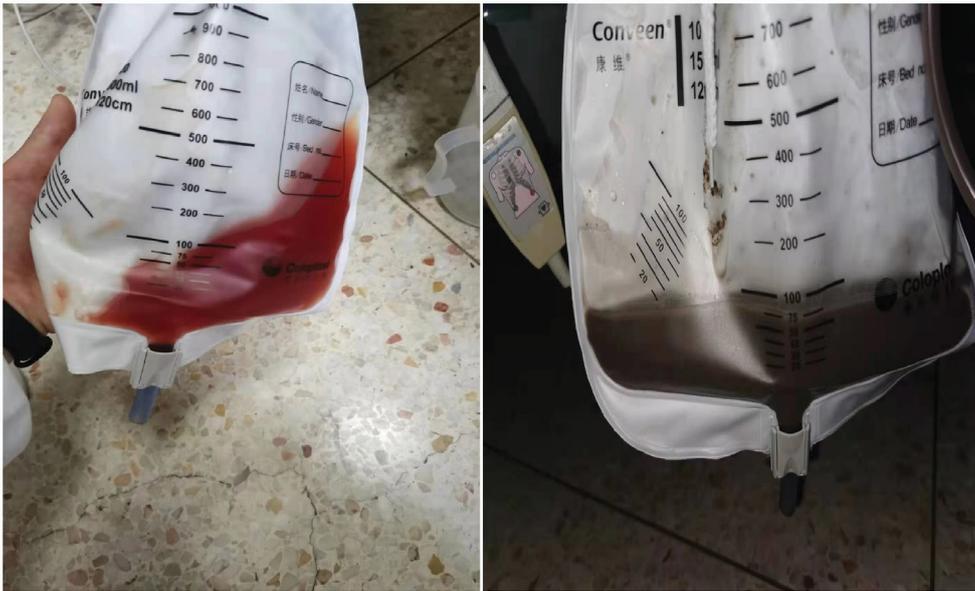


Figure 1: Black urine.

or neuropsychiatric symptoms [6,7]. This patient was unconscious with black urine, but there was no more evidence for it. She took no medication that could account for black urine such as ferric preparations, phenols, or pyrogallol. The urine was red after adequate rehydration that may be caused by urine dilution. At that time, there was no significantly blood deposition in urinary bag and hemoglobin has not decreased, showed no indication of intravascular hemolysis.

Hyperkalemia, high creatine kinase and creatine kinase isoenzyme level and black urine indicate rhabdomyolysis. Metabolic disorder and infection may lead to myoglobinuria, which discolors urine to dark red, brown or black [8].

The abnormal urine color caused by various causes is very common in clinical practice. For example, red urine may be caused by hematuria, hemoglobinuria, myohemoglobinuria, and take medications like nitroimidazoles, anthracyclines [9]. Rifamycin antibiotics may lead to orange urine. Dilantin may cause pink urine. Hemolytic anemia, extensive burns and strenuous exercise may cause brown urine. Urinary tract infection with *Pseudomonas aeruginosa* may cause turquoise urine and obstruction of biliary tract may cause yellowish-green urine [10]. Purple urine bag syndrome and porphyria may cause purple urine [11]. It's worth noting that the same disease can cause different color changes in urine because the concentration of the main substance that causes the discoloration of urine is different.

As a common and frequently-occurring disease, diabetes can cause damage to multiple organs and systems. Black urine from diabetes has not been previously reported and the definite etiology and treatment need further study.

Author Contributions

Conceptualization: Shaoqi Han, Yifei Chen; Investigation: Shaoqi Han, Jing Tu; Resources: Yifei Chen, Jing Tu; Writing-original draft: Han Shaoqi; Writing-review & editing: Chen Yifei.

References

1. Galanis N, Kyrkos M. Brown Urine and Black Hip. *CMAJ*. 2012;184(14):1600.
2. Martens T, van Gammeren AJ, Huijmans JGM, de Man SA. Black discoloration of urine in two young sisters. *J Paediatr Child Health*. 2016;52(6):680-1.
3. Altmann B, Mansell MA. Black Urine. *Postgrad Med J*. 1980;56(662):877-8.
4. Yu C, Liu X, Yang J, Zhang M, Jin H, Ma X, et al. Combination of Immunotherapy With Targeted Therapy: Theory and Practice in Metastatic Melanoma. *Front Immunol*. 2019;10:990.
5. Mishe'el S, Ziv M, Bisharat N. Black Urine and Black Pleural Fluid: A Distinctive Presentation of Metastatic Melanoma. *Eur J Case Rep Int Med*. 2016;3(4):000416.
6. Phillips JD. Heme biosynthesis and the porphyrias. *Mol Genet Metab*. 2019;128(3):164-77.
7. Ramanujam VMS, Anderson KE. Porphyria Diagnostics-Part 1: A Brief Overview of the Porphyrias. *Curr Protoc Hum Genet*. 2015;86:17.20.11-17.20.26.
8. Warrell DA. Venomous Bites, Stings, and Poisoning: An Update. *Infect Dis Clin North Am*. 2019;33(1):17-38.
9. Wüthrich R, Serra A. [The red urine]. *Ther Umsch*. 2006;63(9):595-600.
10. Koratala A, Leghrouz M. Green urine. *Clin Case Rep*. 2017;5(4):549-50.
11. Vikse J, Sæverås MZ, Staal EM, Göransson LG. [Purple urine bag syndrome]. *Tidsskr Nor Laegeforen*. 2019;139(6).