Unusual urinary discoloration: A case report of blue urine in a patient with advanced Prostate cancer

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DOI:10.56018/20241207

ABSTRACT

Here, we present a case of blue urine in an 89 -year-old male with advanced prostate cancer and difficult to control hypertension as well as comorbid type II diabetes mellitus (T2DM), hyperlipidemia and chronic urinary retention. The patient was newly diagnosed with COVID-19 and returned to our hospital after 30 days of first admission, this time in respiratory failure.

Administration of Urogesic-Blue (methenamine, sodium phosphate, methylene blue and hyoscyamine) can cause this discolorization due to its content in part of methelyene blue as evidenced by the presence after analysis. These cases emphasize the importance of being aware that this is a potential harmless side effect to avoid unnecessary diagnostic procedures.

Prostate Cancer, especially when it comes with bone metastasis, increases complexity and difficulty in managing the patient. Comorbidity in the patient and attendant polypharmacy made treatment planning difficult, given that one had to be very cautious about drug-drug interactions so as not only manage mental health effectively but also treat actively existing medical conditions.

The situation escalated following the recent COVID-19 infection, which required hospitalization for final comprehensive monitoring and supportive care. High levels of proBNP suggest that the heart was under some stress, probably further increased by the presence of a virus making this case complex and certainly multidisciplinary.

This case informs the need for a complete medication history and patient counseling in cases of strange clinical presentations. Recognition of Urogesic-Blue as the agent in bluish urine permits health care providers to reassure patients and avoid unnecessary diagnostic work-ups. This report gives an insight into avoidable handling of intricate past medical history and multi-morbidity and adds knowledge on the bedside approach regarding blue urine.

Key words: Blue Urine, Prostate Cancer, Methylene Blue, Urogesic-Blue, COVID-19 Complications

Introduction

Altered urine color can be a disconcerting symptom for both patients and clinicians, often leading to an extensive diagnostic workup in the evaluation of etiology.[1] Blue urine is exceedingly rare among the multitude of colors that urine can turn up as, and its presence might signify a whole spectrum from harmless to serious underlying pathologies.[2] In this case report, we discuss a rare clinical presentation of blue urine in an elderly man with advanced prostate cancer and underscore the significance in appreciating such phenomenon together with understanding its different possible etiologies.

The differential diagnosis of blue urine is extensive, including but not limited to medication side effects, diet influence and metabolic disorders.[3] Notable culprits frequently identified as the offending agent, include food/drugs like Beriplex, Conray and anaesthetic agents such triamterene.[4] Folks may

also produce blue urine if they have a metabolic condition such as familial hypercalcemia. Yet, within the context of malignancy and specifically advanced prostate cancer patients a blue urine may present as diagnostic dilemma thus requiring meticulous review of medical history, medications used in addition to recent interventions done.[5]

Prostate cancer remains a major global health challenge and ranks among the most frequent malignancies in men.[6] The more advanced stages of the disease may require multiple different treatment options such as chemotherapy, hormone therapy and many surgeries which can introduce other complications with various side effects even changing color in urine. Herein, we describe a case of blue urine in a patient with advanced prostate cancer to illustrate the diagnostic approach as well as consider potential explanations and clinical implications for this uncommon constellation.

The goal of this case report is to increase the awareness that blue urine may develop as a clinical sign of advanced prostate cancer and to emphasize on proper evaluation in order not only search for cure but have clues about underlying disease.

Case Report

An old male of 89 years with a previous clinical history of late-stage prostate cancer that had spread to the bones, type 2 diabetes mellitus (T2DM), hypertension (HTN), high cholesterol levels, and chronic urinary retention arrived at the emergency room (ED) complaining of difficulty in breathing. He was tested positive for COVID-19 at home recently where symptoms started on May 20, 2024. Under normal circumstances, his oxygen saturation is around 97% while on room air but he stated it dipped to 93% when lying down along with dyspnea.

On examination there were findings suggestive of lethargy, however arousable and oriented but partial deafness was noticed in him. He complained of having chills but denied complaints about headaches, chest pains, palpitations, coughs, abdominal pain, nausea or vomiting, urinary symptoms or even numbness/tingling/swelling/weakness. In terms of substance use history there's no tobacco smoking involvement neither does alcohol nor illicit drugs.

First laboratory tests in the emergency room (ED) gave results of leukocyte count at 5.8, hemoglobin level of 11.3, glucose concentration of 347, albumin of 3.1, total protein of 5.7, aspartate transaminase (AST) – 10, alanine aminotransferase (ALT) – 7, troponin levels – 52,53 and 49 and proBNP –1550. A COVID-19 PCR test came back positive. Electrocardiography showed sinus bradycardia with a heart rate of 55 beats per minute without acute ischemia.

The patient's medications before admission were gabapentin (Neurontin), methenamine mandelate tablets or syrup , sodium acid phosphate for solution i.p., methylene blue oral tablets and hyoscyamine hydrobromide orally disintegrating tablet (Urogesic-Blue), glimepiride (Amaryl), miconazole nitrate cream USP for vaginal use only, nitrofurantoin macrocrystals/monohydrates capsules or tablets such as Macrobid/Macrodantin/Furadantin/ Nitro-Time/Nitrofur Mac/Lich-Tabs/Caps/Rx only/Macrobid/Macrodantin/Nitro Macro; norfloxacin oral tablets or suspension like NOROXIN/Noroxin/DiscoFloxan; nystatin suspension USP with mycostatin; terazosin oral capsules HCl products like HYTRIN/Terazol/Generic; amiodarone hcl oral tablets such as CordaronePacerone Rx Only; dipyridamole extended-release capsules for oral administration like Aggrenox ; chlorthalidone oral tablets IP or USP are available as Hygroton; clopidogrel bisulfate tablets IP and USP like Plavix; duloxetine enteric-coated pellets for oral use such as Cymbalta DR; diltiazem hydrochloride extended release capsules like Dilt-XR, Taztia XT, and Tiazac; ezetimibe oral tablets such as ZETIA/ Ezetimibe Tablets USP 10mg; fluvastatin sodium extended-release tablets LIVAZO containing fluvoxamine maleate film-coated tablets for oral administration under brand name Luvox CR.

Upon admission, the patient presented with COVID-19, inability to urinate and prostate cancer that had spread to his bones. Drugs he was given included tamsulosin for bladder problems and Urogesic-Blue which contains methylene blue capable of causing urine discoloration. This change in color although not harmful was unusual.

The patient was admitted for further investigation and treatment as an inpatient. Treatment plan entailed hydration support, monitoring on telemetry, and continuation of home meds if necessary after modification. The presentation of blue urine, though rare, was related to the use of Urogesic-Blue thus emphasizing the need for a comprehensive medication history when faced with atypical clinical findings.

Table I: Laboratory Parameters

Parameter	Value	Reference Range	Comments
White Blood Cell Count (WBC)	5.8 x 10^9/L	4.0 - 11.0 x 10^9/L	Within normal limits
Hemoglobin	11.3 g/dL	13.8 - 17.2 g/dL	Low; indicates mild anemia
Glucose	347 mg/dL	70 - 99 mg/dL (fasting)	Elevated; hyperglycemia
Albumin	3.1 g/dL	3.5 - 5.0 g/dL	Low; hypoalbuminemia
Total Protein	5.7 g/dL	6.0 - 8.3 g/dL	Low
Aspartate Aminotransferase (AST)	10 U/L	10 - 40 U/L	Within normal limits
Alanine Aminotransferase (ALT)	7 U/L	7 - 56 U/L	Within normal limits
Troponin	52, 53, 49 ng/L	<0.04 ng/mL	Elevated; suggests myocardial injury
proBNP	1,550 pg/mL	<125 pg/mL (age <75) / <450 pg/mL (age >75)	Elevated; indicates heart failure
COVID-19 PCR	Positive	Negative	COVID-19 infection confirmed

Table II: Vital Signs

Vital Sign	Value	Reference Range	Comments
Blood Pressure (BP)	177/79 mmHg	<120/80 mmHg	Hypertension
Heart Rate (HR)	54-58 bpm	60-100 bpm	Bradycardia
Respiratory Rate (RR)	14-20 breaths/min	12-20 breaths/min	Within normal limits
SpO2	94-100%	95-100%	Slightly low; hypoxia when <95%
Temperature	97.4-98.7°F	97.8-99.1°F	Within normal limits

Discussion

The patient went through shortness of breath, hypoxia and also tested positive for COVID-19 recently. The rare presentation of blue urine was ascribed to the use of Urogesic-Blue, which is given in urinary tract disorders due to its antiseptic and antispasmodic actions.

Not commonly seen by patients as well as clinicians; it can be startling. Among other things, methylene blue compound in Urogesic-Blue were suspected to be the most likely cause of his blue urine. In some instances, methylene blue could dye turning the patients' excretory system liquid into green or bluish colors.[7] This side effect is harmless but if not properly understood can lead to great anxiety on a patient's part. On this occasion, identification of methylene Blue lies at the crux of highlighting how critical it is for doctors to go through previous prescriptions when presented with unusual body parts discoloration during assessment clinics.

ISSN-2231-6140,e-ISSN-2395-7859 Case Report

Prostate cancer is a common malignancy in elderly men and may cause significant morbidity especially when it metastasizes to the bone. This patient had multiple comorbidities including type 2 diabetes, hypertension, and hyperlipidemia which complicated his clinical management. Therefore, caution should have been taken while developing a treatment plan against the possibility of any drug interactions and for overall care.

This patient's recent COVID-19 infection further complicated his case. In this case, COVID-19 came with a range of symptoms including difficulty in breathing as was shown by the patient. Consequently, both hypoxia and dyspnea necessitated admission to hospital where he could be closely monitored until his condition improved. Furthermore, high proBNP levels indicated heart strain that might have been due to virus exacerbation calling for multi-disciplinary approach.

Treatment during admission centered on controlling COVID-19 infection; relieving his respiratory symptoms; and managing his urinary retention. The patient received supportive care with hydration and nutrition as well as continuation of home medications with necessary changes. His urinary retention was managed with Tamsulosin while his hypertension was controlled using Amlodipine, Metoprolol.

The knowledge of a harmless nature of the blue urine allowed unnecessary diagnostic tests to be avoided. The patient was monitored on telemetry with regard to his sinus bradycardia and increased troponin levels indicating myocardial injury. All aspects of the patient's wellbeing were covered through this inclusive approach.

In clinical practice, it is important that medical practitioners obtain a detailed medication history as demonstrated in this case.[8] Blue urine, though uncommon, can be linked to drug intake by patients. By identifying Urogesic-Blue as the cause, health care providers can reassure patients and avoid extensive and costly diagnostic workups. This case exemplifies that medications can have various side effects and clinicians should always be mindful about them.

Conclusion

This unusual clinical presentation of patient with blue urine necessitates accurate medication histories during clinical assessments. The management success of this patient has reiterated importance of multidisciplinary approaches, education to patients as well as being aware of atypical clinical signs. This case adds knowledge on what does it mean when you pee blue and also shows how to take care of complex patients with numerous health problems.

Acknowledgement: We are sincerely thankful to the patient for allowing us to publish this case report.

Funding: No funding sources.

Conflict of interest: None declared.

Ethical approval: The informed consent was taken from the patient.

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