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Green Urine Discolouration Due to a Traditional Medicine: A Case Report

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Abstract: ***The colour of urine is an important factor in urine examination, which can help physicians to differentiate various diseases. And abnormal discolouration of the urine is always alarming to the patient and intriguing to physicians. Green colouration in urine can be caused by endogenous or exogenous factors, for example certain dyes, drug intoxications and diseases can induce green urine discolouration. We present a case of green urine discolouration which happened as a side effect of traditional medicine that contains methylene blue. Simple analysis in the clinical biochemistry laboratory can play a role in avoiding other expensive and unnecessary investigations.***

Keywords: Green urine, methylene blue, traditional medicine

1. Introduction

Urinalysis is considered to be the third most common diagnostic laboratory test worldwide.[1,2] It plays an important role as a primary test as well as in helping the physicians to diagnose and make decisions. Urine colour is one of the important attributes of urinalysis, which is proved to be useful in differentiating various medical situations.[3] In ancient medical practices, as suggested by the retained manuscripts, urine examination and specifically urine colour has been frequently reported as a crucial diagnostic material for a wide variety of illnesses.

The yellow colouration of urine results from urobilin that is produced as a product of bilirubin degradation. Normal urine colour ranges from light yellow to golden. This normal variance generally fluctuates based on urine output per hydration and fluid intake. Conversely, ingesting pigments contained in various foods and medications, such as those in multivitamins, may caused the urine to appear darker and more concentrated. Normal urine is clear but may appear hazy if very concentrated in the face of reduced urine output. Abnormal colour of urine can be orange, red, brown, black, purple, white, blue, and green. Orange urine usually results from medication use such as rifampicin and phenazopyridine.[4,5] Haematuria or blood in the urine is likely to be the most common cause of red urine. Brown urine discolouration can stem from numerous causes of red urine. Old cloth sediment can appear brown when suspended in urine of a certain concentration.[4,5] Black urine discolouration can stem from causes of red or brown urine depending on urine concentration and the intensity of the colour change aetiology. Purple discolouration is rare, porphyria in urine that exposed to sunlight can caused purple urine.[4]White urine also called albinuria, is most commonly due to sediment. The presence of mineral crystal such as calcium or phosphate can lead to a white or snowy-appearing urine.[10] Iatrogenic causes such as methylene blue or indigo carmine are likely to be the most common reason for blue urine discolouration.[4,5]

Causes of blue urine discolouration can also produce a green urine when combined with the yellow colour urobilin produces. Additionally, consumption of foods and supplements that contain green pigmentation can also provide the same effect. Large amounts of asparagus or black licorice have been noted to cause green urine discolouration.[4,6] Some medications that have been implicated include promethazine, cimetidine, amitriptyline, metoclopramide, and indomethacin.[7,8,9,10]Additionally, drugs that contain phenol can be metabolized in such manner that can cause green urine discolouration.[4,5,11] Certain medical conditions can also lead to green urine discoloration is urinary tract infection with *Pseudomonas* species has been observed to produce the green colour.[9,12] Additionally, fistulas into urinary tract that facilitate the passage of bile into the urine stream permit green pigment to stain the urine.

2. Case

A 63-years-old male presented to emergency department complaining about having shortness of breath since yesterday. It emerged suddenly and became heavier when he did some exercises. He also complained about his inability to urinate freely, uncomfortable feeling while urinating, with coughs and backache. He has a history of smoking at his young age. No diabetic, hypertension, cardiac failure, or renal failure history. Physical examination was remarkable of such an elderly man with stable blood pressure 100/70 mmHg, pulse 68 times/min, respiration rate 24 times/min, and body temperature 36.4^0C. His chest was pectus carinatum shape with crackles on both lungs.

On laboratory findings, we found White blood cell $15.22x10^3$/uL, Haemoglobin 9.6 g/dL, Haematocrit 29.6%, Thrombocytes $513x10^3$/uL, Creatinine 5.43 mg/dL, Blood glucose 90 mg/dL, Sodium 133 mmol/L, Potassium 5.1 mmol/L, Chloride 93 mmol/L.

On chest X-ray we found Bronchopneumonia with cardiomegaly and deformity thorax.

Figure 1: Patient's chest X-ray

On Electrocardiogram, we found Sinus rhythm, Normo-Axis and T-inverted on lead V1-V3.

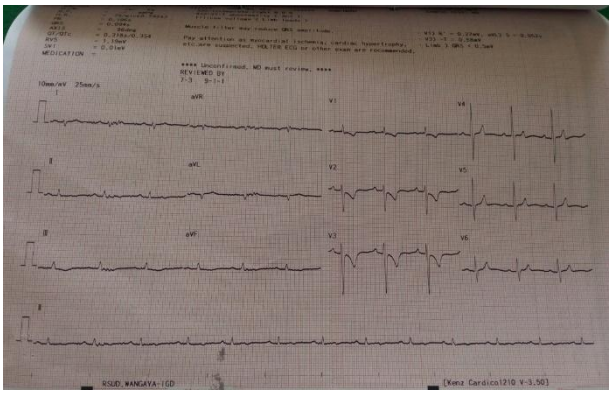

Figure 2: Patient's electrocardiography

The following urine sample was received in the clinical biochemistry laboratory:

Figure 3: Patient's green urine sample

pH 5.0, Concentration >1.030, Protein (-), Glucose (-), Ketones (-), Bilirubin (-), Leukocyte esterase 250 Leu/uL, blood (-).

Microscopic examination : Erythrocytes 2-3/lpb, Leukocytes 6-7/lpb, Bacteria (+), casts (-), Crystal (-)

On further questioning, the patient's wife revealed that her husband has been taking a traditional medicine tablets for the past one month prior to the admission. He consumed four tablets per day. The content of the traditional medicine tablet was extract Hippocampus 2 mg, Panax Ginseng 20 mg, Plantaginis Folium 125 mg, Orthosiphonis Folium 125 mg, Strobilanthi Folium 125 mg, and Retrofracti Fructus 103 mg.

Patient was diagnosed with acute on chronic kidney disease, urinary tract infection, congestive heart failure NYHA (New York Heart Association) classification II-III with suspected Hypertension Heart Disease, and pneumonia.

For the treatment, we gave O_2 nasal 4 L/mins, Ceftriaxone 1 gr every twelve hours, Furosemide one vial every twelve hours, Clopidogrel 75 mg, Bisoprolol 2.5 mg, Lisinopril 5 mg, Spironolactone 25 mg and Folic acid two tablets every twelve hours.

3. Discussion

Normal freshly voided urine should appear in the colour amber-yellow, it should be sterile and clear, with average slight acidic Ph of 6.0 and a particular odor.[1]

Abnormal discolouration of urine can indicate an underlying pathogenic or benign condition. Most frequently, the abnormal discolouration of urine is caused by gross haematuria.[9]Green urine encountered in our case is an uncommon occurrence.

Green colouration in urine can be caused by both endogenous or exogenous aetiology.[4,5,9] Endogenous causes include pathological conditions such as chronic obstructive jaundice where presence of biliverdin (oxidation product of bilirubin) in urine can cause a green colour.[9] Urinary tract infection caused by *Pseudomonas* can turn urine into green due to pyocyanin and pyoverdine pigments produced by the bacterium.[9,12]

Exogenous causes of green urine are more likely and mostly due to oral or intravenous administration of certain compounds. Some medications can result in green urine colouration. Certain phenol-containing drugs have the disposition to cause green urine due to phenol metabolites excreted in urine.[11,13] Propofol, a commonly used phenol-containing intravenous anaesthesia drug has been reported to give green colouration in urine.[11,13] Other phenol-containing drugs which also bring the same green urine effect are cimetidine and promethazine.[9] In addition, other medication such as indomethacin, methocarbamol and magnesium salicylate can produce green-blue urine as their possible side effects.[9]

Water-soluble artificial dyes can cause green urine. Other benign artificial dye such as indigo carmine and also methylene blue (methylthioninium chloride) can be filtered in the urine causing a green colouration.[6]

In medicine, methylene blue is used as a contrast dye and also for treating conditions such as cyanide poisoning and methaemoglobinaemia. Multi-ingredient medications containing methylene blue either as pigment or treatment purposes can potentially colour its consumer's urine into green. Methylene blue excretion in the urine is usually slow; with bulk of the dye is excreted as a stabilized form leucomethylene blue and the remainder as unchanged methylene blue.[6,9]In our case, methylene blue was found to be a component of a traditional medicine tablets the patient had been consuming.

Figure 5: Methylene blue appearance on traditional medicine tablet

Lesson learned from this case is to take into careful observation the endogenous and exogenous causes of green urine through an examination of the patient's clinical history, diet, and medications.[1,9] The patient was told to discontinue the traditional medicine. On review, four days later, the green urine had cleared and creatinine serum was 1.4 mg/dL.

4. Summary

We reported a case of a man, 63 years old, who experienced green urine discolouration due to traditional medicine that contains methylene blue. Although methylene blue is a harmless dye, if it is consumed in a large amount, the accumulation of the dye would be toxic and could damage the renal. Careful observation of the patient's medical history and the physician's awareness of potential side effects of traditional medication are vital to achieve precise diagnosis.Thorough yet simple analysis is proven to be useful in avoiding unnecessary and expensive investigations.

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