

Green urine: a diagnostic clue

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The history of Medicine gives longstanding examples of the important role of urine evaluation, including color, consistency and clarity, as useful clues for the clinical diagnosis.¹ In normal conditions, the color of recently eliminated urine varies from pale to dark yellow. The normal yellowish color is mainly due to the presence of urochrome and urobilin, and urine bags of hospitalized patients give better conditions for evaluation of urine features.¹ However, the samples for laboratory tests should be collected when the patients wake up. Many ancient physicians associated the green urine with a choleric temperament of patients; nevertheless, they also knew that systemic diseases might be reflected by the urine changes.¹ The main causes of green urine are: *Drugs* - amitriptyline, cimetidine, flupirtine, flutamide, indomethacin, metoclopramide, mitoxantrone, promethazine, and propofol; *Ingested substances* - carbolic acid, flavin derivatives, methylene blue and indigo blue dyes, and asparagus; 3. *Metabolic disorders* - Hartnup disease; *Urinary infection* - *Pseudomonas* (pyocyanin/ pyoverdin); and *Enterovesical fistula* – biliverdin.¹⁻⁵

Blue-green urine was also associated with bromoform, clioquinol, methocarbamol, phenilbutazone, phenyl salicylate, resorcinol, tetrahydronaphtalene, thymol, tolonium, triamterene, and zaleplon.¹ It is worth nothing that if the phenomenon is reversible and the urine color returns to normal, sophisticated and more expensive evaluations are not commonly performed.³⁻⁵ Moreover, if the green urine first appeared after admission, the most probable hypothesis is iatrogenic. At hospital, this green discoloration has been more often related to medications and dyes as the example of propofol and methylene blue utilized in the routine of invasive procedures.¹ Propofol is metabolized by cytochrome P450 enzymes before the liver glucuronidation; therefore, more elevated levels of the metabolites occurs following alcohol consumption.¹ The excess of biliverdin found in green jaundice due to biliverdin reductase insufficiency is a known cause of the green discoloration observed in the plasma as well as in the urine.¹ Anamnesis should focus on medications, nutritional supplements, and ingestion of green pigments; the urine must be analyzed

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for biliverdin and cultured for bacterial infections.¹⁻⁵ A possible concern involving intense urine discoloration is about the

interference with some routine colorimetric tests, as can be observed in glucose and the total protein determinations.



Figure 1. Deep green discoloration of the urine collected after the patient's admission.

In daily clinical practice green urine is a relatively uncommon condition, which more often results of some unsuspected benign and reversible cause as ingestion of a dye substance. Physicians should avoid stress, involving the patient and its family, with clear explanations.

Changes in urine color are easily observed and can yield clues of unsuspected conditions; thus, clinical images may enhance the suspicion index of the health care workers about them.

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