

It's Not Easy Being Blue-Green

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A 53-year-old man with prostate cancer underwent prostate brachytherapy one month ago. Since then, he has experienced increased urinary frequency, dysuria, perineal discomfort, reduced urinary stream velocity, and nocturia. The patient was prescribed the following medications to relieve his urinary frequency and dysuria: sulfamethoxazole/trimethoprim, ciprofloxacin, tamsulosin, methylprednisolone, ibuprofen, and Phosphasal. He denied any special diet. Urinalysis and culture results were normal except for the blue-green color of the urine. Urinary microscopic examination revealed 3 red blood cells per high-power field. His serum PSA was 7.4 µg/L.

The questions were raised as: A) What caused this urine color change? B) What other conditions could cause this urine discoloration? C) Can this discoloration be pathological or cause any test interference?

The normal color of urine ranges from light yellow to dark amber, depending on the concentration of solutes in the urine. Patients may be quite frightened at any unusual urine color, especially with accompanying symptoms such as frequent urination and burning pain with urination. Food dyes and additives are the most common causes of blue or green urine. A few foods, especially asparagus, can cause a greenish discoloration. Certain medications can cause blue or green urine, including amitriptyline, doxorubicin, indomethacin, cimetidine, phenergan, triamterene, rinsapin, propofol, Prosed DS, sildenafil, and B vitamins [1, 2]. A number of medical conditions, such as familial

hypercalcemia, indicanuria, and pseudomonas infection, may cause urine to become blue or green.

Blue or green urine may be caused by a blue dye such as methylene blue, which has weak antiseptic properties and is a component in several medications (Trac Tabs, Urised, Uroblue) used to reduce symptoms of bladder inflammation or irritation [1, 2]. The Phosphasal this patient was given for his dysuria contains methylene blue, which contributed to the blue-green urine color [2]. Methylene blue is increasingly used in cancer chemotherapy regimens. Methylene blue is well absorbed by the gastrointestinal tract and rapidly reduced to leukomethylene blue, which is stabilized in some combination form in the urine and excreted mostly in unchanged form. It peaks approximately 2-6 hr after oral administration and remains detectable in 24 hr [3]. The blue-green urine is a normal side effect of this medication and is harmless.

Urine discoloration due to diet or medication is unlikely to be harmful. If it is due to a medication, the patient should be advised of potential side effects other than urine color change. Methylene blue may cause falsely increased blood methemoglobin levels by co-oximetry and other colorimetric assays such as glucose and protein [1, 4]. If the patient has not ingested a food or medication known to change urine color, further investigation is warranted to rule out medical conditions or infection.

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