

CLINICAL IMAGE

Green urine

M.A. Kuiper

Department of Internal Medicine, Medical Center Leeuwarden, Leeuwarden, the Netherlands

Correspondence

M.A. Kuiper – email: mi.kuiper@wxs.nl

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A 28-year-old male was admitted to our ICU after an attempted suicide with gamma-hydroxybutyrate (GHB). He was initially comatose, and was intubated and ventilated. The next day he had to be sedated with midazolam and propofol because of severe GHB withdrawal symptoms.¹ During the second day of his ICU treatment, we noticed that his urine had turned green. Most notably, his urine was a normal colour when it was produced, as could be seen in the urine meter; however, after some time in the urine collection bag, his urine discoloured and turned dark-green, as is shown in the picture (*figure 1*).



Figure 1. The urine meter shows a normal urine colour during production

We first suspected GHB to be the cause of this urine discoloration. As GHB is short-acting, and the medical literature does not mention this as an effect caused by GHB, we soon turned our attention to other causes. There are some drugs known to cause the urine to turn green: cimetidine, promethazine, amitriptyline, indomethacin, metoclopramide, and flutamide, but he had not used any of these drugs. Also substances such as methylene blue and indigo blue dyes in enteral feeds, or asparagus can cause this. We also had to consider excretion of bile into the urine, as can be caused by a vesico-enteral fistula. This was an unlikely cause, as the urine was a normal colour at the moment it left our patient's body, and turned green later. This left us with only one

explanation: propofol. Propofol is a short-acting, intravenous sedative-hypnotic agent given to induce and maintain anaesthesia or sedation. It follows a linear pharmacokinetic model. The main metabolic pathway of propofol is oxidation, reduction, and hydrolysis by cytochrome P450 and glucuronate conjugation in liver microsomes. Propofol is excreted in the urine after glucuroconjugation of the parent drug.

There are 21 papers to be retrieved from PubMed using the search string 'Propofol green urine'. Most of these papers are case reports. The exact mechanism by which the discoloration of urine occurs remains to be elucidated. There seems to be neither a relation between the total amounts of propofol infused, nor the duration thereof. In the cases that have been published as yet, green urine was shown after 6-86 hours of continuous infusion.²⁻⁴ The green colour is reported to be a consequence of the excretion of the quinol derivatives 4-(2,6-diisopropyl-1,4-quinol)-sulphate, 1- and 4-(2,6-diisopropyl-1,4)-glucuronide resulting from renal sulfo- and glucuroconjugation of propofol.⁴ What makes the observation in our patient different is that we saw the colour of urine change after it had been excreted, and while it was outside the body. This suggests a conversion not due to hepatic dysfunction or decreased entero-hepatic circulation, as has been hypothesised by others.⁴

Although green urine associated with propofol is rare and benign, prompt recognition is important in limiting unnecessary laboratory testing, medical expenditures and distress among patients and clinicians.

References

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