

Case Report: Pink Urine Syndrome



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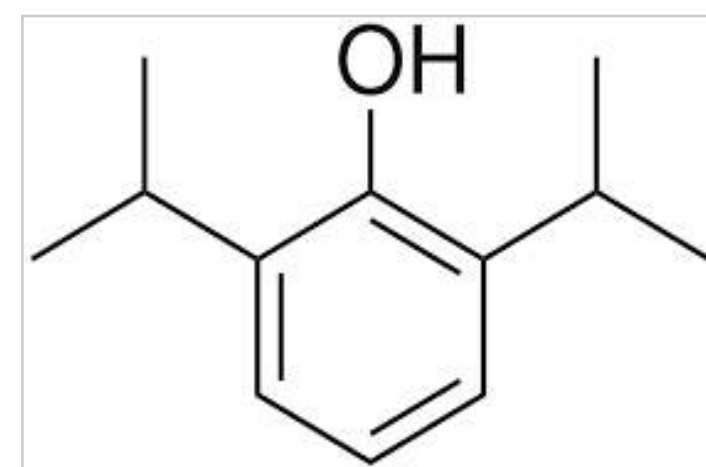
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Introduction

Propofol (2,6-diisopropylphenol) is a commonly used intravenous anesthetic agent due to its rapid onset of action and relatively safe therapeutic window.¹ Propofol acts by modulating the inhibitory function of the GABA neurotransmitter. It is primarily metabolized by the liver through glucuronidation and to a smaller extent via cytochrome P450 enzymes. The metabolites are then excreted through the kidneys.^{2,3} As a result, Propofol has infrequently been associated with a self-limiting urine discoloration which will seem alarming for those unfamiliar with the phenomena.⁴



Propofol molecule



Figure 1: Pink sedimented urine

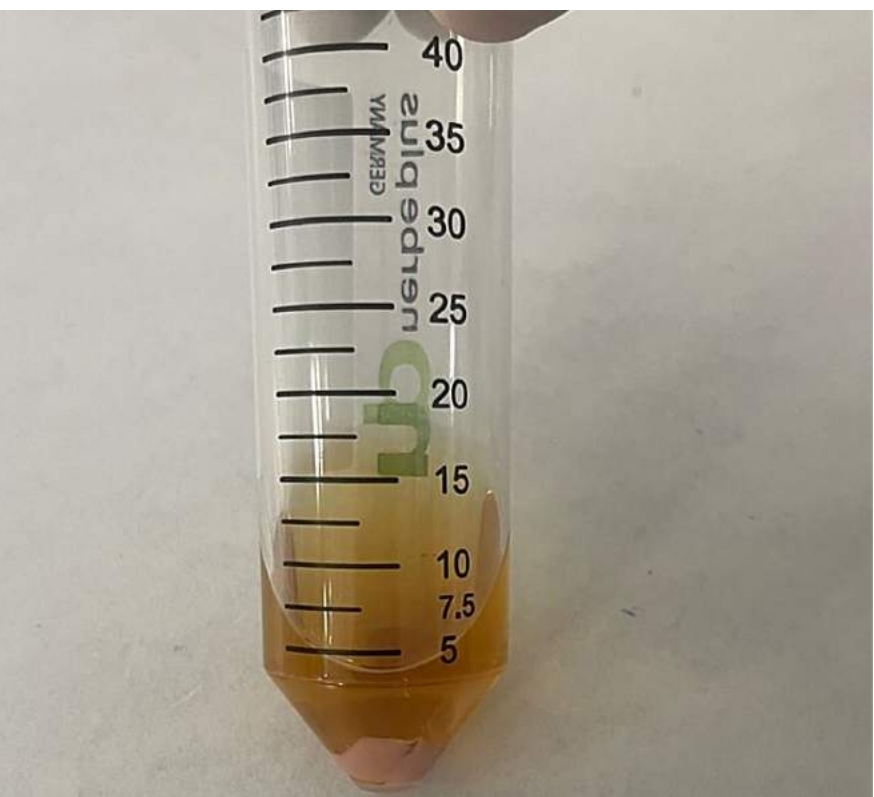


Figure 2: Pink crystal following centrifugation

Case report

A 35-year-old morbidly obese gentleman, with no prior urological history, suddenly developed pink sedimented urine (Figure 1) after undergoing urgent sigmoid colectomy for severe diverticulosis under General Anesthesia; with Propofol as the induction agent. He was managed post operatively in the intensive care unit and was kept ventilated and sedated using Propofol.

At day 1 in the postoperative period he was noted to have asymptomatic pink discoloration of his urine. Clinical examination did not reveal any abnormalities. A urinalysis showed a low urinary pH of 5.0, specific gravity of 1.030 and the absence of blood, leukocytes or nitrate. His serum creatinine level was within normal range. Cultures of the urine were sterile and the ultrasonography of the urinary system was normal. Interestingly his urine microscopic examination revealed amorphous urate crystals and no blood cells. His serum uric acid level was high at 450umol/L. A pink sediment rapidly precipitated in the urine following centrifugation (Figure 2).

This condition spontaneously resolved after 4 days.

Discussion

Propofol urine syndrome, a rare condition first reported in the 1800s by Louis Proust, who described it as "substance rosacée" or "acid rosacique," a unique occurrence. It is characterized by pink sedimented urine forming crystals on centrifugation, mainly after Propofol anesthesia. This can be differentiated by the lack of blood and presence of uric acid crystals on urine microscopic analysis.⁴

There are several hypotheses for the occurrence of pink urine with Propofol usage. Male gender, obesity, insulin resistance, lowered urinary pH, and high serum uric acid were noted in all reported cases. Propofol increases uric acid excretion in the urine, while a lowered pH commonly seen in patients with insulin resistance encourages sedimentation.⁵

It's important to note that this heightened urinary excretion of uric acid crystals is usually transient and has no toxicity to the human body, and unnecessary testing should be avoided.

Conclusion

Pink urine is a curious Propofol-induced phenomenon. This can seem alarming to health professionals who are not familiar with it. An understanding of the mechanism and the risk factors can alleviate this unease, especially if there is no toxicity or harm to patients. Spontaneous resolution is expected, once pathological causes are excluded.

References

1. Folino TB, Muco E, Safadi AO, et al. Propofol. [Updated 2023 Jul 24]. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK430884/>
2. Maalouf, N. M., Cameron, M. A., Moe, O. W., Adams-Huet, B., and Sakhaee, K. (2007). Low Urine pH: a Novel Feature of the Metabolic Syndrome. *Cjasn* 2 (5), 883-888. doi:10.2215/CJN.00670207
3. Masuda, A., Asahi, T., Sakamaki, M., Nakamaru, K., Hirota, K., and Ito, Y. (1997). Uric Acid Excretion Increases during Propofol Anesthesia. *Anesth. Analgesia* 85 (1), 144-148. doi:10.1097/0000539-199707000-00026
4. Tucker, B. M., and Perazella, M. A. (2019). Pink Urine Syndrome: A Combination of Insulin Resistance and Propofol. *Kidney Int. Rep.* 4 (1), 30-39. doi:10.1016/j.ekir.2018.10.009
5. Zhang F, Zhu X, Zhang H, Xu L, Wu W, Hu X, Zhou H, Wei P, Li J. Case Report: Pink Urine Syndrome Following Exposure to Propofol: A Rare, Impressive but Benign Complication. *Front Pharmacol.* 2021 Jun 15;12:686619. doi: 10.3389/fphar.2021.686619. PMID: 34211398; PMCID: PMC8241095.