



**Figure 1:** Milky white urine initially and one hour after stopping propofol infusion

## Milky urine! A cause for concern?

Sir,

A 16-year-old American Society of Anesthesiologists class I male patient weighing 50 kg with dorsolumbar scoliosis, with Marfan's syndrome and mitral valve regurgitation, was scheduled for posterior instrumentation and fixation. His pre-operative investigations were within normal limits. In the operating room, all routine monitors were attached to the patient and general anaesthesia was induced with fentanyl 100 mcg, propofol 100 mg and vecuronium 5 mg. The patient's trachea was intubated with a cuffed orotracheal tube no. 7 mm and he was positioned prone for surgery with necessary precautions. As an intraoperative motor-evoked potentials monitoring was planned, anaesthesia was maintained with total intravenous anaesthesia (TIVA) with propofol infusion (100 mcg/kg/min). Two hours after starting TIVA, milky pink urine was observed. Surgeons were asked to stop the surgery and look for any pressure to the kidneys. As we had internet access in the operating area, a net search revealed that TIVA could be the suspected cause of the milky pink urine. TIVA was immediately withheld and the urine sample was sent for analysis. As the quantity of urine was adequate, and vital parameters of the patient were within normal limits, the surgeons were asked to re-commence the surgery. One hour after stopping propofol infusion, the urine started to become clear and, 2 h later, the urine was completely clear [Figure 1]. The urine sample was sent for analysis again on the first post-operative day. Post-operative recovery was uneventful. Intraoperative urine analysis revealed uric acid and, in the post-operative urine sample, there was no presence of uric acid. There were no pus

cells or casts in the intraoperative as well as in the post-operative samples. Rest of the renal functions were within normal limits in both the samples. The patient was discharged home after 1 week.

Three types of colored urine have been described in the literature: Green,<sup>[1-3]</sup> white<sup>[4]</sup> and milky pink.<sup>[5,6]</sup> The true incidence of this urine discoloration is not known.

Green urine is attributed to phenol metabolites,<sup>[3]</sup> which are excreted renally. White urine was reported by Nates *et al.*<sup>[4]</sup> in four patients, and they attributed it to the vehicle of propofol emulsion.

Milky pink urine was observed initially by Masuda *et al.*<sup>[5]</sup> in 9 patients, and they attributed it to intraoperative hypotension and oliguria that cause accumulation of propofol and its metabolite in urine. They inferred that all patients with milky urine were those patients who were posted in the late afternoon and were relatively dehydrated. However, in our patient, there was no episode of intraoperative hypotension or oligouria, and the surgery was scheduled first in the day.

Masuda *et al.*,<sup>[6]</sup> in their study of 23 patients, performed a urine analysis of all patients undergoing surgeries with TIVA ( $n=11$ ) and sevoflurane ( $n=12$ ) anaesthesia. They inferred that all patients on TIVA had increased urine uric acid. However, only two of 11 patients had milky urine. Milky color urine is observed more frequently in operation theatres with ambient temperature less than 24°C.<sup>[6]</sup> The reason attributed to this is that decreased temperature causes decreased solubility to uric acid crystals.

In our patient, the most probable cause seems crystallization of uric acid in the cold ambient temperature of the operating room, which was 18°C. Urine discoloration is self-limiting and transient and is not associated with any long-term renal damage.

Therefore, unnecessary investigations can be avoided, but it is important to rule out the cause.

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