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CORRESPONDENCE

Endotoxemia due to propofol contamination in four consecutive patients



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Due to its preparation as a lipid emulsion, propofol, it supports the growth of microorganisms,¹ and febrile illness and sepsis have been reported when strict guidelines for its preparation are not followed.^{2,3} We report four patients who experienced endotoxemia after propofol injection.

Four patients were scheduled for gastroscopy and colonoscopy. Four syringes of propofol, four syringes of midazolam, and four syringes of fentanyl were prepared from one ampule of propofol (Anesvan, 20 mL/200 mg/ampule; Chi Sheng Chemical Corporation, Hsinchu, Taiwan), two ampules of midazolam, and two ampules of fentanyl, respectively, by an anesthesiologist under sterile conditions. Each syringe was dedicated to an individual patient without cross-usage. Ampules of propofol were stored at 20–22°C, and were received in boxes sealed by the manufacturer and were not expired. Gastroscopy was performed first, and prior to the colonoscopy an additional 20 mg of propofol (from the remaining propofol in the syringe) was administered. The total examination time was approximately 2 hours.

Shortly after arriving in the recovery room, all four patient exhibited chills, increased body temperatures (38.3–41.7°C), and tachycardia (heart rate > 100 beats/

minute). Due to a suspicion of propofol contamination, the residual propofol was collected and stored in a refrigerator.

Leukocytosis and elevated C-reactive protein was noted in all patients, but no evidence of disseminated intravascular coagulation or sepsis was found. The patients were treated with antibiotics and supportive care, and all symptoms had resolved by the third day. All culture results were negative. Patients were subsequently discharged in good condition.

The residual propofol was sent for endotoxin testing (EMO Biomedicine Corporation, New Taipei City, Taiwan). The endotoxin concentrations of the four syringes of propofol were 1484.5 endotoxin units (EU)/mL, 2809.3 EU/mL, 1859.3 EU/mL, and 957.9 EU/mL. A separate syringe with residual propofol from an unrelated procedure was also tested, and the endotoxin concentration was <5 EU/mL.

Propofol is a white, oil-in-water emulsion that contains no preservatives or antimicrobial agents. Because of its lipid base, propofol supports the growth of bacteria and thus the potential for endotoxin contamination exists.⁴

Endotoxin is a complex of lipopolysaccharides derived from the outer cell membrane of Gram-negative bacteria, and is liberated when the bacteria die. Endotoxin causes the release of proinflammatory mediators such as tumor necrosis factor and interleukin-1 from monocytes and macrophages resulting in septicemia syndrome. Because of its resistance to extreme temperatures and pH values, endotoxin is almost impossible to destroy with normal sterilization procedures.⁴ Although self-limited febrile-syndromes have been reported after propofol

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administration, little evidence has been provided that they are due to endotoxin.⁵ In the four cases presented here, the common denominator was the single propofol ampule, and laboratory testing of the propofol syringes indicated high levels of endotoxin.

In conclusion, although propofol is considered safe adherence to strict guidelines for its preparation and administration must be followed. Propofol-related fever is more common, but endotoxemia should be considered in the diagnosis of febrile illness after propofol use.

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