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Surgical Endoscopy

Cetrimide overdose

The intraperitoneal use of cetrimide 1% [6] has recently been advocated as an adjunct to the treatment of hydatid disease of the liver [4]. We would like to report the case of a 2-year-old boy who died following such a treatment regime.

A 2-year-old Moroccan boy was admitted with general malaise and fever. Clinical examination revealed a mass in the liver. A diagnosis of chronic granulomatous disease was made but concomitant hydatid disease of the liver could not be excluded. We decided to puncture the mass in the liver under laparoscopic control, after immersing the liver in cetrimide 1%, a scolicidal agent, as has been advocated by Khoury et al. [4]. General anesthesia with endotracheal intubation was induced with intravenous thiopentone, sufentanyl, and vecuronium, and it was maintained with halothane 0.6–1% in oxygen-enriched air and with additional doses of sufentanyl and vecuronium. Monitoring included ECG, pulse oximetry, nasal temperature, intra-arterial and central venous pressure, and end-tidal CO_2. A 5-mm trocar was inserted through the infraumbilical fold using an open technique. Pneumoperitoneum was induced with CO_2 at an initial pressure of 5 mmHg and later at 8 mmHg (initial flow rate 2 l/min, later 5 l/min). No surface abnormalities of the liver were seen. The patient was positioned head down with a three-quarter right lateral tilt. The epigastrium was then punctured with a 14-gauge Abbocath and cetrimide 1% was instilled until the liver was completely submerged, which required 1 l of the solution. No fluid was obtained on ultrasound-guided laparoscopic puncture of the mass in the liver. After about 1 h, the instilled cetrimide solution was aspirated and 800 ml was easily retrieved. Before removing the laparoscope and closing the trocar wound, the peritoneal cavity was rinsed three times with 1 l of normal saline. The patient remained stable during the procedure, which lasted 1¾ h. No unexpected physiological changes were noted despite extensive monitoring. However, after withdrawal of halothane, the patient failed to regain consciousness, and it was noted that the pupils were dilated and did not respond to light. The patient was apneic with a general flaccid paralysis. Although supplementary doses of sufentanyl and vecuronium had not been given for more than 1 h, neostigmine, atropine, and naloxone were administered. However, this did not result in any improvement in the clinical condition of the child. Arterial blood analysis revealed a mild respiratory and a severe metabolic acidosis (pH 7.05, pCO_2 53 mmHg, base excess −15 mmol/l, pO_2 157 mmHg, with an FiO_2 of 40%). Despite the adjustment of the ventilator and the administration of sodium bicarbonate, the metabolic acidosis continued to increase over the ensuing hours. As methaemoglobinemia formation is a known complication of the use of cetrimide, a blood sample was taken to measure this and 15 mg methylene blue was given intravenously [1, 4]. The methemoglobin level, however, later proved to be within normal limits (less than 0.6%). The laboratory detected mild hemolysis, but neither macroscopic hematureia nor hemoglobinuria was observed. Both may be associated with absorption of cetrimide [2, 3]. As the patient remained unconscious with a flaccid paralysis and fixed dilated pupils, he was transferred to the intensive care unit, where, 90 min after the end of surgery, he became cardiovascularly unstable and subsequently died 1 h later, despite vigorous resuscitation measures. Postmortem examination failed to reveal a cause for the patient's death.

A number of complications have been described in association with internal use of cetrimide, including coma [3], fixed dilated pupils [2, 3], flaccid paralysis [2, 3], metabolic acidosis [2, 5], cardiovascular collapse [2, 5], cardiac arrest [2], methemoglobinemia [1, 4], hemolysis [2], hemoglobinuria, and hematuria [2]. None of these reported complications, however, has been lethal or has resulted in long-term morbidity.

We were not able to confirm cetrimide absorption by plasma bromide analysis, as has been suggested [5]. As bromide ions (Br^-) are distributed over 25% of the body weight (i.e., 4 l in our patient), absorption of 100 ml cetrimide 1% (i.e., 60 mg/kg in our patient, at least twice the reported lethal dose [3]) will elevate plasma Br^- to a maximum value of 0.75 mmol/l. This is below the detection limit of the commonly used gold-chloride-analysis technique for bromide. As a result of our experience, we consider that cetrimide is a dangerous and potentially lethal agent for internal application. It should certainly not be used intraperitoneally as has been recently advocated [4]. Even treatment of the hydatid cyst cavity with cetramide may result in life-threatening complications [3]. We conclude that the use of cetrimide should be restricted to external application only.

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