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Clinical Description of the Adverse Event Profile of an 11-Year-Old Girl Given a Massive Total Dose of Intravenous Lipid Emulsion

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BACKGROUND

Intravenous lipid emulsion (ILE) has been advocated as an antidote for toxicity from intravascular injection of local anesthetic drugs. Goals and endpoints of ILE therapy are still being defined; the range of associated adverse effects, and the toxicity profile, of ILE therapy is still be characterized. We describe a case of a girl given 66 mL/kg of 20% lipid emulsion in the treatment of presumed mepivacaine toxicity.

CASE REPORT

An 11-year-old girl developed pallor, rolling back of the eyes, and rhythmic muscle twitching after receiving a mandibular nerve block injection with a 1.8 mL ampule of 3% mepivacaine. Her blood pressure remained stable, but with concern for persistent seizures she was given three 1 mL/kg boluses of ILE, followed by an infusion of 0.25 mL/kg/min. The total dose ultimately administered was 3,670 mL (66 mL/kg) over 7 hours. A serum triglyceride concentration, drawn 2 hours after cessation of ILE infusion, was estimated to be 16,583 mg/dL after several dilutions; her blood was grossly lipemic. Notable signs included hypersomnolence, tachypnea, and tachycardia. In addition to the hypertriglyceridemia, other complications included apparent metabolic acidosis with hyperlactatemia, difficulty with serum laboratory interpretation, and abnormal contrasting of brain computed tomography. The lipemia cleared over three days and the girl recovered; in retrospect she was not believed to have actually manifested mepivacaine toxicity.

DISCUSSION

Most ILE dosing guidance recommends an upper-bound daily maximum dose of 12.5 mL/kg. This girl received a very high dose of ILE, equal to an LD-50 derived from an experimental rat model, and approaching total blood volume. Adverse events were associated with the high level of lipemia noted in this case, but full recovery was achieved with supportive care.

CONCLUSIONS

This report demontrates the need for cautious use of new therapies, provides data pertaining to the tolerability and adversity of a high dose of ILE, and should inform future development of therapeutic ILE dosing guidelines.