Lipid Emulsion (Liposyn™) Use Precluding Renal Replacement Therapy

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Background

- Intravenous lipid emulsion (ILE) therapy is a potential treatment for toxic side effects of lipophilic agents. Case reports suggest that ILE can be used as a treatment for overdose with: local anesthetics, calcium channel blockers, and lipophilic beta blockers; however, no optimal regimen has been currently established.(1,2)
- While ILE is relatively non-toxic, animal data and case reports suggest that possible complications related to increased blood viscosity such as pulmonary edema and sudden death could occur.
- To our knowledge, this is the first case report of a complication of ILE therapy that precluded the hemodialytic support of a poisoned patient.

Case History

- 26 y/o male kidney transplant patient that presented to an outside ER after an intentional overdose of his medications that included: amlodipine, metoprolol, lisinopril, tacrolimus, mycophenolate and prednisone. At presentation he was hypotensive (96/40) and bradycardic (52) which was refractory to IV: fluids, calcium, glucagon and vasopressors. (See Fig.1).
- Initial bolus of 1.5mg/kg (120ml) of ILE at 20% was given after consultation with toxicology, dose was repeated x1, after some response to initial dose with HR improving to 85.
- Continuous IV infusion at 0.25mg/kg/min was then planned for 4-6 hrs or until the patient was hemodynamically stable on pressors.
- 5 hrs after admission, the patient was still hypotensive and was becoming more hypoxic. Labs at this time revealed renal failure, hyperkalemia, metabolic acidosis and CXR showed pulmonary edema. (see Fig. 2) Plans were made for emergent CRRT.
- During placement of HD catheter, thick, lipemic appearing blood was noted. Intralipid therapy was then stopped and the patient had received a total of 5 hrs of continuous infusion (6.24 L total vol or 79 ml/kg).
- CRRT was attempted using Prismaflex and a HF 1400 dialyzer

Case History, cont.

- Within 15 min of initiation, fat was observed in the filter with elevated trans-membrane pressures that ultimately led to obstruction of the filter. (see Fig. 3)
- Plasmapheresis (see Fig. 4) was initiated as an attempt to remove ILE, and while visually successful for removal of lipid the patient continued to deteriorate hemodynamically despite maximal vasopressor support. After 1.5 hrs of plasmapheresis, the patient’s family decided to withdraw care and the patient died.

Discussion

- Although ILE infusion is a potential therapy for lipophilic medication overdoses, the efficacy has not been established.
- There has been a case report of calcium channel blocker toxicity treated with a bolus of 100ml and infusion of 0.5 ml/kg/hr x 24hrs without complications. In our case, the patient received a higher dose. (3)
- The potential toxicities of high dose ILE therapy are unknown. In our case, it precluded the use of CRRT and may have contributed to his pulmonary edema.

Summary and Conclusion

- First known case report of ILE therapy compromising ability to provide renal replacement therapy.
- Further testing may be needed to determine the maximal rate and total dose of ILE therapy that is compatible with ability to perform renal replacement therapy, but ILE has reportedly been used safely to maximal dose of 20ml/kg.

References