Other Complications Following Lipid Emulsion Therapy

Re: Levine M, Skolnik AB, Ruha AM, et al. (2013) Complications following antidotal use of intravenous lipid emulsion therapy. J Med Toxicol Dec 13. [Epub ahead of print]

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To the Editor:

We read with much interest Levine et al.'s retrospective review of complications associated with the administration of intravenous lipid emulsion (ILE) therapy as a treatment for drug toxicity [1]. They report pancreatitis and adult respiratory distress syndrome following the administration of ILE. Another potential but less reported complication of ILE therapy may be deep venous thrombosis (DVT).

We recently published a case report on a 30-year-old patient who developed an acute upper extremity DVT following ILE therapy for wide complex tachycardia and hypotension following an ingestion of diphenhydramine [2]. At the time of this occurrence, we had never encountered this complication following ILE administration at our institution and were not familiar with similar reports in the literature. We are aware that fat overload is a known complication of high-dose fat emulsion and can result in multiple complications including fat embolism [3]; however, this is generally a delayed event [4]. We also know that ILE can lead to thrombophlebitis [5]. While the development of a DVT could have been a coincidence, DVT formation is listed as a potential complication of ILE therapy in a review of data from the Toxicology Investigators' Consortium (ToxIC) registry [6]. The review of the ToxIC registry demonstrated

that three out of nine patients (33 %) that received ILE therapy developed DVTs. The authors of the manuscript attempted to judge the association between ILE and the adverse events using the Naranjo scale. They gave DVT a score of 1, which means that there was a possible association. It is not mentioned if DVTs were located in the limb where ILE was being infused or, if the treating physicians thought the acute DVT, was associated with the ILE. Our patient was not included as a part of this review.

Given the novelty of ILE and relative lack of experience with this therapy, we believe that it is important to make clinicians aware of this possible association as DVT is a potentially life-threatening condition. While we still lack definitive proof that ILE causes DVT, we do wonder if there is an association and if it could be related to how it is administered. Central venous access (if available) may be preferable to giving ILE peripherally as was done with our patient. The rate of the infusion of the initial bolus could also be related to DVT formation. Lastly if more occurrences of DVT following ILE administration are reported, should this change what is already a somewhat ambiguous threshold for its administration?

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Conflict of interest None

References

1. Levine M, Skolnik AB, Ruha AM, et al (2013) Complications following antidotal use of intravenous lipid emulsion therapy. J Med Toxicol Dec 13. [Epub ahead of print]
2. Abdelmalek D, Schwarz ES, Sampson C, Halcomb SE, McCammon C, Arroyo-Plasencia A, Stenger A, Krehbiel N, Mullins ME (2013)

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- Life-threatening diphenhydramine toxicity presenting with seizures and a wide complex tachycardia improved with intravenous fat emulsion. *Am J Ther* Oct 3 [Epub ahead of print]
3. Driscoll DF (2006) Lipid injectable emulsions: pharmacopeial and safety issues. *Pharm Res* 23:1959–1969
 4. Geyer R (1960) Parenteral nutrition. *Physiol Rev* 40:150–186
 5. Package Insert: Liposyn III 30 %. (2005) Ref type: pamphlet
 6. Geib AJ, Liebelt E, Manini AF (2012) On behalf of the toxicology investigators' consortium (ToxIC). Clinical experience with intravenous lipid emulsion for drug-induced cardiovascular collapse. *J Med Toxicol* 8:10–14

This was not previously presented.