ToxTidbits

Maryland Poison Center
UNIVERSITY OF MARYLAND SCHOOL OF PHARMACY

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The Maryland Poison Center's Monthly Update: News, Advances, Information

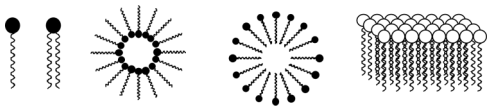
Intravenous Lipid Emulsion—Update

In 2010, the American Society of Regional Anesthesia and Pain Medicine published a systematic approach for treating local anesthetic systemic toxicity (LAST). A part of these recommendations included use of intravenous lipid emulsion (ILE) therapy, sometimes referred to as lipid rescue or just "Intralipid®" (lipid emulsion). Case reports suggested efficacy as an early antidote for LAST. These cases were limited to resuscitation of patients with cardiovascular collapse secondary to local anesthetics, such as bupivacaine, lidocaine or ropivacaine. One of the postulated mechanisms of ILE is the "lipid sink", which creates a lipid compartment in the blood to draw lipophilic substances out of the tissues and organs sensitive to the toxic effects of the substance. The review also provided case examples of the effectiveness of lipid rescue for bupropion and haloperidol associated cardiotoxicity due to the high lipophilicity of these medications. At this time the adverse effects related to acute lipid infusion were not known or documented.

Since 2010, ILE has been utilized in a variety of overdoses and has gained popularity secondary to anecdotal evidence or experience. Multiple retrospective studies have identified cardiotoxic medications where ILE was used. These include calcium channel blockers, tricyclic antidepressants, beta-adrenergic antagonists, bupropion, class 1 antidysrhythmics and selective serotonin reuptake inhibitors, among others. Due to the limited evidence of ILE in these cases, it is only recommended during cardiac arrest or in life-threatening toxicity, and not as a first-line agent. Another gray area is when to administer ILE in relation to other interventions. One study that reviewed poison center fatalities in which ILE was administered, attempted to distinguish the timing of ILE's administration *(Clin Toxicol 2019 Mar; 57(3): 197-202)*. The majority of ILE was given as a "cocktail" where multiple therapies were listed and the order could not be determined. ILE administration as a last resort or during cardiac arrest comprised almost 52% of ILE timing. Studies have also identified associated risks of ILE. Cases have described patients developing acute respiratory distress syndrome (ARDS), hypoxia, acute kidney injury, circuit/line obstruction, pancreatitis and laboratory interference *(Clin Toxicol 2016 Jun; 54(5): 383-389)*.

ILE can potentially be a life saving antidote when used in special circumstances. It is recommended for patients with LAST, and may be considered if a patient is suffering cardiovascular collapse from a lipophilic substance/medication. It is important to keep in mind that ILE alone may not be enough to reverse toxic effects, and proper advanced cardiac life support along with other first-line interventions are needed. If ILE is administered, monitoring for adverse effects such as ARDS or pancreatis is warranted.

Immediate treatment with ILE is recommended for LAST, but you should call your regional poison center at 1-800-222-1222 prior to administration of ILE for any cases where you are unsure of the diagnosis or benefit.



Phospholipid forms in the blood

Did you know?

Intravenous lipid emulsion has been used as antidotal therapy for almost 20 years.

Intravenous lipid emulsion (ILE) use was first published in a patient case in 2006 to reverse cardiac arrest in the setting of local anesthetic systemic toxicity (LAST). Since then, it has gained attention for its use for LAST and non-local anesthetic overdoses. Evidence for its use in overdoses have been limited to case reports or case series, which raises concerns of publication bias as good outcomes are more likely to be published. In recent studies that characterized patients who received ILE therapy, many received aggressive attempts including ILE in resuscitation efforts, but the patients did not survive.

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