Introduction

- Used as a source of parenteral nutrition for over 40 years.
- Used as diluent to deliver highly lipophilic drugs like propofol.
- First line therapy for treating the systemic toxicity of local anaesthetics
  - Not FDA approved.
IFE In Toxicology

- First case report described the use of IFE for a 58-year-old male who had asystole after he was given local injections of bupivacaine and successfully treated with IFE therapy in 2006.


**TOXICOLOGY/CASE REPORT**

Use of Lipid Emulsion in the Resuscitation of a Patient With Prolonged Cardiovascular Collapse After Overdose of Bupropion and Lamotrigine

A 17-year-old girl developed seizure activity and cardiovascular collapse after intentional ingestion of up to 7.95 g of bupropion and 4 g of lamotrigine. Standard cardiopulmonary resuscitation for 70 minutes was unsuccessful in restoring sustained circulation. A 100-mL intravenous bolus of 20% lipid emulsion was then administered, and after 1 minute an effective sustained pulse was observed. The patient subsequently manifested significant acute lung injury but had rapid recovery.
Use of Lipid Emulsion in the Resuscitation of a Patient With Prolonged Cardiovascular Collapse After Overdose of Bupropion and Lamotrigine
Clinical Uses

Clinical experience. There are 4 peer-reviewed reported cases of calcium channel blocker toxicity treated with ILE as of the writing of this manuscript. In all these cases, authors describe instituting other recommended supportive therapy (eg, IV fluid resuscitation, vasopressors, mechanical ventilation, IV calcium, insulin, and glucagon).

Clinical Uses

Clinical experience. Two peer-reviewed case reports have been published, describing propranolol toxicity treated with ILE. In the case reported by Dean et al, a 27-year-old female had ingested about 7 g of propranolol, who was then brought to the emergency department in an unconscious and hypotensive state. Her initial rhythm was sinus bradycardia with a pulse, but progressed into a PEA. After ACLS, she had ROSC but needed a high-dose epinephrine infusion (at 4 mg/h) to maintain acceptable blood pressure. At that point, ILE was given (Intralipid 20%, 100 mL bolus followed by 400 mL over
Clinical Uses

ing a case of amitriptyline toxicity treated with ILE. A 27-year-old, 80-kg male was admitted comatose, with a wide complex tachycardia and hypotension. He later developed a pulseless VT, received CPR for 18 minutes before ROSC. A tricyclic antidepressant overdose was suspected and a decision to administer ILE was made. Besides receiving sodium bicarbo-

J Intensive Care Med 2014 29: 59 originally published online 24 June 2012
DOI: 10.1177/0885066612445978

Clinical Uses

An overdose with quetiapine (an atypical antipsychotic) and sertraline (a selective serotonin reuptake inhibitor) was successfully treated with ILE, as described in a published case report. The ILE was given relatively early in this case and the patient’s level of consciousness promptly improved from Glasgow Coma Score of 3 on admission to 9 during the administration of ILE (20% Intralipid, 100 mL bolus, and 400 mL

J Intensive Care Med 2014 29: 59 originally published online 24 June 2012
DOI: 10.1177/0885066612445978
Mechanism of Action

- **The lipid sink/sponge mechanism**: it soaks up lipid-soluble xenobiotic and removes it from the site of toxicity.
- **Increasing intra-myocyte calcium level**: leads to a direct positive inotropic effect.
- **Modulation of intracellular metabolism**: Fatty acids may overcome blocked or inhibited enzymes by mass action, providing energy to an energy "starved" heart which will reverse the toxicity.

The lipid sink/sponge mechanism
Mechanism Of Action

FATTY ACID OXIDATION

ATP REDUCTION
Possible Applications For IFE

- Local anesthetics systemic toxicity.
- Life threatening overdoses not responding to standard of care therapy for:
  - Calcium channel blockers - verapamil.
  - Beta blockers - propranolol.
  - Antipsychotics – quetiapine.

Dose

- Bolus 1.5 mL/kg IV over 1 minute
- Continuous infusion 0.25mL/kg/min
- Repeat bolus once or twice for persistent cardiovascular collapse
- Continue infusion for 10 minutes after attaining circulatory stability
- Recommended upper limit: 10 mL/kg lipid emulsion over the first 30 minutes
Fat Emulsion Adverse Effects

- Allergic reactions.
- Fat embolization.
- Sepsis.
- Pancreatitis.
- ARDS.
- Fat overload syndrome (headaches, fever, jaundice, hepatosplenomegaly, DIC and respiratory distress).

More Problems

- Potential interaction with some antidotes.
- Difficult laboratory analysis of lipemic blood such as AST.
- Theoretical risk of IFE enhancing GI drug absorption (reverse gut dialysis).
- Fluid overload.
- Clog the filter of the dialysis line.
Contraindications

• Egg allergy.
• Soybean allergy.
• Liver disease patients.
• AMI.
• Disorder of fat metabolism.

Online Guidance

LipidRescue™ Resuscitation
... for drug toxicity

Click Here If You Need Help Right Now

Welcome
Background
Treatment Overview
Instructions (PDFs)

A Review of Lipid Resuscitation
A Comprehensive Review
...
Summary

Consider IFE for:

- Local anesthetics systemic toxicity.
- If standard supportive care is not effective and other invasive strategies are not available for several lipid –soluble xenobiotic such as verapamil and some Beta blocker toxicity as well.
- Antipsychotic(quetiapine ,haloperidol).
- Antidepressant (sertraline, venlafaxine).
- Herbicide(glyphosate).
- Bupropion and lamotrigine overdose.

References

Thank You