



Novel treatment for Ivermectin toxicity

DID YOU KNOW?

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Did you know 20% Liposyn® can be used as an adjunct treatment of certain poisonings including ivermectin? The mechanism is suspected to be related to the lipophilic nature of the toxic drug.

There are three theories of how intravenous fat emulsions may help:

- They create a pharmacological sink for fat soluble drugs. By creating a serum lipid partition, the effective concentration of the fat soluble drug to the tissues is decreased.
- They augment cardiac energy supplies. Fatty acids are the primary substrate for myocardial ATP production. Supplementation improves performance in the ischemic, hypodynamic heart.
- They may restore myocyte function by increasing intracellular calcium

Human physicians started using Liposyn® to treat the cardiac toxicity associated with the accidental overdose of local anesthetics. Assorted other toxins treated with Liposyn® that have been reported in human and lab animal literature include: bupivacaine, bupropion, Lamictal, chlorpromazine, propranolol, thiopental, verapamil, and clomipramine.

The ASPCA Poison Control is now recommending lipid infusion for the treatment of toxicity associated with ivermectin, moxidectin, and calcium channel blockers. Theoretically Liposyn® could be beneficial for treating other common lipophilic toxins affecting small animals such as baclophen, pyrethroids, and marijuana. So far the results of its use with different lipophilic drugs are mixed. An additional use of Liposyn® for milbemycin toxicity will be reported in a paper pending publication. At this time we are still extrapolating the best dosage and administration from limited antidotal results and from human and lab animal literature.

Liposyn® is relatively inexpensive, stored at room temperature, and has a two year shelf life. It is safe to use. Negative side effects from the hyperlipidemia may be of some concern. It was suggested by the ASPCA Poison Control Center to check the plasma before repeating the dose of lipids. If the plasma is still lipemic it is advised not to repeat administration until the plasma clears.

Current recommended dosing of Liposyn® (using a 20% solution) to treat a toxicity by Dr Wismer at the ASPCA Animal Poison Control Center are as follows: give an initial bolus of 1.5 ml/kg followed by a CRI of 0.25 ml/kg/min for 30 – 60 minutes. This can be repeated in 6-8 hours if the serum is not lipemic and if the patient is still symptomatic.

Treatment with Liposyn® does not replace the other basic treatment of certain toxicities including the standard decontamination procedures of emesis or lavage, a cathartic or enema, and activated charcoal when indicated. Liposyn® infusion has been successfully used at SOVSC for several cases of Ivermectin toxicity as an adjunct treatment and has shortened the hospital stay with positive outcomes.

References:

- Picard J, Meek T. A response to "lipid emulsion to treat bupivacaine toxicity." *Anesthesia* 60:1158, 2005
- Weinberg, G Lipid rescue resuscitation from local anesthetic cardiac toxicity. *Toxicol Rev.* 25:139-45, 2006
- Di Gregorio et al. Lipid emulsion is superior to vasopressin in rodent model of resuscitation from toxin-induced cardiac arrest. *Crit Care Med.* March 2009;37(3):993-9
- Animal Poison Control Center, An Allied Agency of the University of Illinois

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