

Treatment of flecainide intoxication with a lipid emulsion

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Dear Editor,

I read the article titled 'Renal failure, shock, and loss of pacemaker capture: A case of flecainide intoxication' recently published in *The Netherlands Journal of Medicine*.¹ Lipid emulsions have been widely used to treat systemic toxicity caused by local anaesthetics or other drugs with high lipid solubility.² Flecainide, an antiarrhythmic drug with a high lipid solubility (Log [octanol/water partition coefficient]: [3.78]) and cardiac sodium channel blocking activity similar to the local anaesthetic bupivacaine (Log [octanol/water partition coefficient]: 3.41), is used for the treatment of atrial fibrillation and supraventricular tachycardia.³ Heldens et al. suggest lipid sink as an underlying mechanism for lipid emulsion-induced recovery from cardiogenic shock due to flecainide intoxication.¹ However, other possible mechanisms should also be considered. First, scavenging effect is another recently widely accepted mechanism, in which the lipid phase of a lipid emulsion absorbs lipid-soluble drugs such as bupivacaine from vital organs such as the heart.² These highly lipid-soluble drugs are then transported into adipose tissue and muscle for storage and to the liver for detoxification.² Second, Intralipid® attenuates the blockade of cardiac sodium channels induced by bupivacaine.⁴

This may result in lipid emulsion-mediated reversal of sodium channel blockade by a toxic dose of flecainide and may contribute to recovery from flecainide intoxication. Third, flecainide has a negative inotropic effect, whereas lipid emulsion itself produces a positive inotropic effect.^{3,5} Thus, I believe that lipid emulsion treatment described in this case may be effective against flecainide intoxication-induced cardiogenic shock refractory to standard treatment.

REFERENCES

1. Heldens M, van der Nat GAM, Melman PG. Renal failure, shock, and loss of pacemaker capture: A case of flecainide intoxication. *Neth J Med.* 2019;77:189-92.
2. Ok SH, Hong JM, Lee SH, Sohn JT. Lipid emulsion for treating local anesthetic systemic toxicity. *Int J Med Sci.* 2018;15:713-22.
3. Andrikopoulos GK, Pastromas S, Tzeis S. Flecainide: current status and perspectives in arrhythmia management. *World J Cardiol.* 2015;7:76-85.
4. Nadrowitz F, Stoetzer C, Foadi N, et al. The distinct effects of lipid emulsions used for "lipid resuscitation" on gating and bupivacaine-induced inhibition of the cardiac sodium channel Nav1.5. *Anesth Analg.* 2013;117:1101-8.
5. Fettiplace MR, Ripper R, Lis K, et al. Rapid cardiotoxic effects of lipid emulsion infusion*. *Crit Care Med.* 2013;41:e156-62.