

Lipid Emulsion versus DigiFab in a Rat Model of Acute Digoxin Toxicity

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Abstract : Although the mechanism of action is not well known, Intravenous Lipid Emulsion (ILE) has been shown to be effective in the treatment of lipophilic drug intoxications. It is thought that ILE probably separate the lipophilic drugs from target tissue by creating a lipid-rich compartment in the plasma. The second theory is that ILE provides energy to myocardium with high dose free fatty acids activating the voltage gated calcium channels in the myocytes. In this study, the effects of ILE treatment on digoxin overdose which are frequently observed in emergency departments was searched in an animal model in terms of cardiac side effects and survival. The study was carried out at Yeditepe University, Faculty of Medicine-Experimental Animals Research Center Labs in December 2015. 40 Sprague-Dawley rats weighing 300-400 g were divided into 5 groups randomly. As the pre-treatment, the first group received saline, the second group received lipid, the third group received DigiFab, and the fourth group received DigiFab and lipid. Following that, digoxin was infused to all groups until death except the control group. First arrhythmia and cardiac arrest occurrence times were recorded. As no medication causing arrhythmia was infused, Group 5 was excluded from the statistical analysis performed for the comparisons of first arrhythmia and death time. According to the results although there was no significant difference in the statistical analysis comparing the four groups, as the rats, only exposed to digoxin intoxication were compared with the rats pre-treated with ILE in terms of first arrhythmia time and cardiac arrest occurrence times, significant difference was observed between the groups. According to our results, using DigiFab treatment, intralipid treatment, intralipid and DigiFab treatment for the rats exposed to digoxin intoxication makes no significant difference in terms of the first arrhythmia and death occurrence time. However, it is not possible to say that at the doses we use in the study, ILE treatment might be successful at least as a known antidote. The fact that the statistical significance between the two groups is not observed in the inter-comparisons of all the groups, the study should be repeated in the larger groups.

Keywords : arrhythmia, cardiac arrest, DigiFab, digoxin intoxication

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