

Evaluation of electrocardiogram changes in normovolemic hypotensive dogs treated with fluids alone or in combination with ephedrine or dobutamine

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Abstract

Normovolemic hypotension can occur due to vasodilation or loss of vascular tone sympathetic nervous system. The aim of the present study was to evaluate electrocardiographic changes and rhythm disorders in normotensive dogs with isoflurane-induced hypotension and treated with ephedrine, dobutamine and fluid therapy. Twenty-nine adult male and female dogs of Mixed breed, weighing 20.1 ± 4.3 kg and in the age range 1.5-2.5 years-old were selected. Anesthesia was induced and maintained with propofol and 1.5% isoflurane in 100% oxygen, respectively. Then, hypotension was induced by deep anesthesia provided with 3% isoflurane. The dogs were given one of five treatments of 1- Ringer's solution (1 ml/kg/min, n=5), 2- Ringer's solution (1 ml/kg/min) with intravenous administration of ephedrine (RE, 0.2 mg/kg, n=6, 3- Ringer's solution (1 ml/kg/min) with intravenous infusion of dobutamine (RD, 5 µg/kg/min, n=6), 4- Intravenous administration of ephedrine (E, 0.2 mg/kg, n=6) and 5- Intravenous infusion of dobutamine (D, 5 µg/kg/min, n=6). By the time the direct blood pressure reached above 60 mmHg after challenge, treatment was discontinued, and the amount of isoflurane was reduced. If there were no responses, the treatment was repeated once again. Electrocardiogram was obtained from all animals at defined time points. Heart rate after treatment was significantly higher in the ringer's with dobutamine (184.2 ± 14.75) than in ephedrine (99.6 ± 23.8) and dobutamine ($108.8 \pm 20/29$). Heart rate in the ringers with ephedrine after treatment (110.5 ± 26.46) was significantly higher than the baseline. The changes in P wave, QRS, PR interval, QT, heart electrical axis, and ST segment shape were insignificant. It was concluded that the addition of ephedrine or dobutamine to conventional fluid therapy in normovolemic hypotensive dogs can be associated with higher heart rate values. According to the obtained results, dobutamine with ringer's solution increased the heart rate more than the other groups.

Key words: Hypotension, Dobutamine, Ephedrine, Electrocardiogram, Dog

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