Comparison of tissue perfusion and electrocardiogram parameters in experimentally induced hemorrhagic shock dogs resuscitated with lactated ringer and hydroxyethyl starch solutions


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Abstract
Hemorrhagic shock remains one of the leading causes of death following multiple organ ischemic injuries in dogs. The aim of this study was to compare tissue perfusion and electrocardiographic parameters in experimentally induced acute hemorrhagic shock in dogs before and after resuscitation with the lactated ringer and hydroxyethyl starch 6% solutions. The parameters of tissue perfusion included the gingival mucosal color, CRT, peripheral pulse quality, appendage temperature, serum lactate concentration, heart rate, mean arterial blood pressure and urine output plus ECG were evaluated in ten male adult healthy mongrel dogs which instrumented, and anesthetized (control measurement). Hemorrhage was performed with removal of up to 60% of blood volume to keep MAP between 40 and 50 mm Hg (second set of measurements). After a 30-minute stabilization period in hemorrhagic shock condition, the third set of measurements was performed. The dogs were randomly assigned to two study groups which received lactated ringer or hydroxyethyl starch solutions, 20 or 5 ml/kg respectively in four consecutive 15–min periods (fourth to seventh measurements). One hour after the last resuscitation stage, the dogs were monitored and at the end of this time, an eighth evaluation step was carried out. Time induced a significant effect on heart rate, mean arterial blood pressure, appendage temperature, urine output, serum lactate concentration, R wave amplitude and Q-T interval. While solution type had a significant effect on serum lactate concentration, urine output and P wave amplitude. The results of this study showed that each of lactated ringer and hydroxyethyl starch solutions, has no significant effect in the short term on tissue perfusion and electrocardiogram parameters in hemorrhagic shock resuscitated dogs.

Key words: Hemorrhagic shock, Hydroxyethyl starch, Tissue perfusion, Electrocardiogram, Dog

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