

Hemodynamic status and oxygenation changes after 6% hetastarch versus whole blood infusion in canine hypovolemic shock.

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Purpose: To compare effects of 6% hetastarch (Hextend) and Whole Blood on hemodynamics, arterial oxygen content, and systemic oxygen delivery in a canine hemorrhagic shock model.

Materials and Methods: We evaluated the result of cardiopulmonary function in the experimental normovolemic and severe hypovolemic shock model in anesthetized beagles. In 10 adult beagle dogs, After being anesthetized, they were surgically instrumented with an arterial catheter and a thermodilution cardiac output catheter. For blood removal, a right carotid artery catheterization was performed. Approximately 40% of the dogs' blood volume was withdrawn simultaneously from the right carotid artery at a rate of 20-25 mL/min until a mean arterial blood pressure of about 50 mmHg was reached. Recordings were made before (BL), after 1 hr of hemorrhagic shock (PH), and after the end of infusion (R1) and 3 hrs after infusion (R4) of either 30 mL/kg hetastarch (group 1), 30 mL/kg whole blood (group 2).

Results: Blood withdrawal (average 31 +/- 4 mL kg(-1)) caused significant hemodynamic changes, metabolic acidosis and hyperlactatemia characteristic for hemorrhagic shock. WB transfusion restored all variables. 6% Hetastarch resuscitation returned hemodynamic variables to or above BL but further decreased total Hb and CaO₂, preventing recovery of DO₂I (p < 0.05). Thus, O₂ extraction was above BL (p < 0.05) while acid-base variables recovered to BL, although slower than in WB groups (p < 0.05). Nevertheless, all experimental beagles in two group were survived until R4.

Conclusion: The results suggest that resuscitation with whole blood seemed to resolve metabolic acidosis and lactatemia more rapidly than 6% hetastarch, and also it is superior to 6% Hetastarch in improving DO₂I.

Key words: canine hypovolemic shock, 6% hetastarch, whole blood.

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