

# The physiological changes of cumulative hemorrhagic shock in conscious rats.

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Hemorrhagic shock is a common cause of death in emergency rooms. Current animal models of hemorrhage encounter a major problem that the volume and the rate of blood loss cannot be controlled. In addition, the use of anesthesia obscures physiological responses. Our experiments were designed to establish an animal model based on the clinical situation for studying hemorrhagic shock. Hemorrhagic shock was induced by withdrawing blood from a femoral arterial catheter. The blood volume withdrawn was 40% of the total blood volume for group 1 and 30% for group 2 and 3. Group 3 was anesthetized with sodium pentobarbital (25 mg/kg, i.v.) at the beginning of blood withdrawal. Our data showed that the survival rate was 87.5% at 48 h in the conscious group and 0% at 9 h in anesthetic group after hemorrhage. The levels of mean arterial pressure, heart rate, white blood count, TNF-alpha, IL1-beta, CPK, and LDH after blood withdrawal in the anesthetic group were generally lower than those in conscious groups. These results indicated that anesthetics significantly affected the physiology of experimental animals. The conscious, unrestrained and cumulative volume-controlled hemorrhagic shock model was a good experimental model to investigate the physical phenomenon without anesthetic interference.