THE EFFECT OF HYPERTONIC SOLUTIONS ON THE RED BLOOD CELLS OF DOMESTIC ANIMALS

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In order to investigate the application in veterinary medicine of a parenteral hyperalimentation and a hypertonic lactated saline solution (which are recently commonly used in human medicine), an experimental study was performed *in vitro* to determine the influence of hypertonic solutions on the red blood cells of the dog, horse, cow and goat. Various concentrations of hypertonic D-glucose and NaCl soutions were used as hypertonic solutions.

The following results were obtained.

1) When the red blood cells of the dog, horse, cow and goat were incubated in hypertonic solutions, the hematocrit value (Ht) decreased. In the hypertonic D-glucose solution, Ht decreased in the following order: dog >horse > cow > goat. In the hypertonic NaCl solution, Ht decreased in the following order: horse > cow > goat > dog. In the horse, cow and goat, there was no difference in the decrease in Ht between the hypertonic D-glucose and NaCl incubation, but in the dog, the decrease in Ht was significantly small in the NaCl incubation compared to the D-glucose incubation.

2) After the dog, horse, cow and goat red blood cells were incubated in hypertonic solutions, the osmotic resistance test was done. The osmotic resistance increased with the hypertonic D-glucose incubation and decreased with the hypertonic NaCl incubation only in dog red blood cells. But in the red blood cells of other animals, osmotic resistance was unchanged.

The above data suggests that there is low permeability of D-glucose in dog red blood cells but high permeability in horse, cow and goat red blood cells. Na^+ permeability is large in dog red blood cells but small in horse, cow and goat red blood cells.