

SPECIES-RELATED DIFFERENCES IN THE CARDIO-VASCULAR SYSTEM REGULATION OF SOME UNDOMESTICATED MAMMALS

Summary

Development of the knowledge about the animal blood circulation along with the classical methods used for blood pressure measurement are briefly described. It has been supposed that the arterial blood pressure may differ importantly in various undomesticated mammalian species, and also should be different from that existing in humans, but the experimental proofs were lacking. In the late fifties of XX century I have obtained an exceptional opportunity to perform the terminal experiments on the individual representatives of the mammals eliminated from exposition in the Polish ZOO gardens for different reasons. I was, therefore, able to test experimentally the reactivity of cardiovascular and respiratory systems on the exogenous vasoactive hormones (adrenaline A, noradrenaline NA and acetylcholine ACh) applied to the deeply anesthetized animals non-treated additionally and submitted to the 15-min infusion of the lactic acid (LA), simulating general hypoxia evoked by the muscular effort. Surprisingly, in several "athletic species", i.e. able to perform long-lasting running, represented here by bison and hare, reactivity of the cardio-vascular system to the adrenergic stimulation was high and neither changed during LA infusion nor after 15-min lasting recovery. On the other hand, in some other species, like deer, fallow deer or wild boar, a very

high reactivity to A/NA seen already in the basal (pre-infusion) conditions, was strongly stimulated during LA-induced hypoxia, suggesting that in these species ability of the organism to perform long-lasting muscular effort (e.g. running without necessity to stop to take some rest) is possible due to the increased cardio-vascular reactivity to the adrenergic stimulation in the hypoxic conditions. Third way of the cardio-vascular reaction to the adrenergic stimulation was observed in "non-athletic species", e.g. in barbary sheep, in which high basal reaction to A treatment disappeared already after 6-min lasting LA infusion, was not observed at the end of 15-min lasting infusion and was not restored even during 15 min of recovery.

To summarize, selected experimentally obtained data clearly indicate that the different mechanisms involved in the regulation of so important physiological function as blood pressure and respiration should be considered in the term of the life history of each species. It seems to be essential when one consider physiology/pathology of several undomesticated mammals, frequently submitted to the rearing and medical treatment in the ZOO gardens, and also should be useful for veterinary students professional formation.