

VASOMOTOR CHANGES IN HUMANS INDUCED BY LOCAL PERIPHERAL COOLING

L. Janský, S. Vybíral, K. Slováček, D. Jandová, Z. Machádle, M. Borovská, L. Nováková and P. Reymanová, Dept. of Animal Physiology, Faculty of Biology, Southbohemian Univ., Budweis, Czech Republic.

The aim of the study was to find out to which extent the local peripheral cooling can induce physiological responses similar to those observed after whole body cooling (Janský *et al.*, 1996). It was found that immersion of legs (up to the knees) into the cold water (13°C) induces immediate decrease in toe and calf skin temperatures down to the level of water temperature. This response is completed within 5 min and persists for the whole period of cooling (40 min), indicating strong vasoconstriction in the immersed parts of the body. No signs of cold induced vasodilation (CIVD) were observed. Skin temperatures in the nonimmersed parts of the body do not change significantly. There is a trend for a small decrease of skin temperature on the chest and a trend for an increase in skin temperature on fingers, however. Rectal temperature, metabolic rate, heart rate and blood pressure do not change during cold water immersion of legs. Only nonsignificant changes in noradrenaline and adrenaline concentrations in the venous blood were found, indicating very small or transitive involvement of the sympathetic nervous system. Repeated cold water immersions of legs (30 min, 5 times a week for a period of 3 weeks) increase skin temperature of nonimmersed parts of the body (chest, fingers), thus indicating attenuation of vasoconstriction and greater supply of the warm blood to the skin. Since no significant changes in sympathetic activity occur, the role of downregulation of adrenergic receptors or of humoral vasodilators should be taken into consideration. Physiological significance of this adaptational phenomenon is not clear. Rectal temperature also tends to increase after repeated immersions of legs, which contrasts with our earlier observations obtained on humans exposed to repeated head-out cold water immersions (Janský *et al.*, 1996). Metabolic, insulative and hypothermic types of adaptation, which typically occur in cold adapted humans, were not observed after repeated cold water immersions of legs. Neither the CIVD, occurring in hands immersed into the cold water, was influenced by repeated cold water immersions of legs.

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jansky@mbox.cesnet.cz