

## MECHANISMS OF PROTECTIVE ACTION OF PHYSICAL ACTIVITY ON THE OCCURRENCE, CLINICAL COURSE, AND FUNCTIONAL RECOVERY FROM ISCHEMIC STROKE

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In this paper, a review of literature was done regarding the mechanisms of impact of physical activity on the incidence of cerebrovascular disease - ischemic stroke (IS), on the degree of neuronal damage and clinical picture and degree of functional recovery after IS.

The mechanisms by which physical activity protects against IS are multifactorial. The protective effects are most often related to vascular risk factor modification, reduction of neuronal apoptosis, cerebral edema and infarction volume. Physical activity increases the levels of some biohumoral factors with important protective functions for cell growth and neuroplasticity. Physical activity stimulates neurogenesis and angiogenesis, prevents blood-brain barrier dysfunction, reduces inflammatory response, and controls glutamatergic excitotoxicity. In this manner it improves cerebrovascular function, increases nerve tissue tolerance to hypoxia, and reduces the degree of damage, thereby improving clinical presentation and providing a higher degree of functional recovery, reducing also the rates of mortality from IS. Furthermore, physical activity leads to enhanced brain tissue tolerance to ischemia, mediated by increased levels of protective heat shock proteins. Physical activity causes an increase in the level of TNF $\alpha$ , reducing the expression of its receptors over time and limiting in this manner inflammatory damage in the pathogenesis of IS, in which TNF $\alpha$  plays a crucial role. Physical activity is important for the prevention of overweight and obesity, which are recognized as the leading causes of IS.

A large number of studies have demonstrated a protective effect of physical activity on the incidence, course and outcome of IS. Physical activity, even at early ages, reduces vascular risk factors and obesity, thus preventing IS. The mechanisms of prevention are mediated by a complex effect on metabolic processes. *Acta Medica Mediana* 2017;56(3):70-76.

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