THE ACTION OF THERAPEUTIC ULTRASOUND ON THE CATALYTIC ACTIVITY OF THE DISSOCIATING ENZYMES

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The action of ultrasound of therapeutic intensity on the organism is known to evoke changes in many biochemical parameters including of enzymes. For understanding of the mechanism of this action, it is important to study the direct influence of low intensity ultrasound (0,05 ÷ 1,0 Wt/cm^2) on the enzymes.

We studied the action of therapeutic ultrasound on the catalytic activities of dissociating enzymes in solution (creatine kinase, hexokinase) and subunit enzymes (lactate dehydrogenase, pyruvate kinase) with the stable quaternary structure under different experimental conditions.

It has been shown that ultrasound has no effect on the catalytic activity of the enzymes, regardless of their structure and substrate concentrations. However we were able to show a small acceleration of the dissiciation of the dimeric form of creatine kinase.

In a heterogeneous system (immobilized creatine kinase) an increase in the enzymatic activity was registered which seemed to be linked with a decrease in diffusion limitations caused by acoustic microstreamings.

Therefore, although ultrasound produces no direct action on enzyme catalysis it may increase the enzyme activity by some indirect mechanisms.