Current Topics in Biophysics, 2007, 30 (suppl. B) 55

CHANGES IN LIPID PEROXIDATION AND ANTIOXIDANT ENZYMES ACTIVITIES IN PATIENTS SUBJECTED TO CRYOTHERAPY

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Cryotherapy is the use of cryonical temperatures (from –100°C to –160°C) for triggering off and using organism physiological reactions to cold. It includes 8–10 treatments, one daily. Patients spend 3 minutes in cryogenical chamber and then they are subjected to intensive kinesitheraphy. That kind of treatment is used in combination with pharmacological theraphy, biologic revitalization and rehabilitation.

Blood cells are exposed to high oxygen concentration constantly. They are rich in polyunsaturated fatty acids so they are susceptible to peroxidation reactions. Products of lipid peroxidation modify physical properties of cells membranes. They can change the structure of membranes, decrease membrane hydrophobicity and inhibit activities of membrane enzyme and transport proteins. In this study we determined the effect of cryotherapy on the activities of the antioxidant enzymes: catalase (CAT), peroxidase (GPx) and superoxide dismutase (SOD) and on lipid peroxidation (TBARs level) in red blood cells of patients.

Changes in enzyme activities and TBARs level were measured in 67 patients with different ablation (multiple sclerosis, spin and joint degenerative deseases, rheumatoid arthrosis). Blood samples were taken before the first cryotherapy treatment and after 8 days of treatments (ACD was used as an anticoagulant). All measurements were carried out on the next day.

GPx activity was measured by the Rice-Evans's method (1991), the SOD activity was measured by the adrenaline test (Misra, 1985), Bartosz's method (2003) was used in catalase activity determining. Statistical significant decreases in activities of antioxidant enzymes (CAT – about 6%, GPx – about 30%, SOD – about 35%) was observed.

To determine the extent of lipid peroxidation the Stock and Dormandy's method (1971) was used. Changes in TBARs level were measured in 42 patients. Statistical significant decrease (about 20%) of the level of lipid peroxidation products was observed.