

Muscle Neurotrophins Family Response to Resistance Exercise

Authors : Rasoul Eslami, Reza Gharakhanlou

Abstract : NT-4/5 and TrkB have been proposed to be involved in the coordinated adaptations of the neuromuscular system to elevated level of activity. Despite the persistence of this neurotrophin and its receptor expression in adult skeletal muscle, little attention has been paid to the functional significance of this complex in the mature neuromuscular system. Therefore, the purpose of this research was to study the effect of one session of resistance exercise on mRNA expression of NT4/5 and TrkB proteins in slow and fast muscles of Wistar Rats. Male Wistar rats (10 mo of age, preparation of Pasteur Institute) were housed under similar living conditions in cages (in groups of four) at room temperature under a controlled light/dark (12-h) cycle with ad libitum access to food and water. A number of sixteen rats were randomly divided to two groups (resistance exercise (T) and control (C); n=8 for each group). The resistance training protocol consisted of climbing a 1-meter-long ladder, with a weight attached to a tail sleeve. Twenty-four hours following the main training session, rats of T and C groups were anaesthetized and the right soleus and flexor hallucis longus (FHL) muscles were removed under sterile conditions via an incision on the dorsolateral aspect of the hind limb. For NT-4/5 and TrkB expression, quantitative real time RT-PCR was used. SPSS software and independent-samples t-test were used for data analysis. The level of significance was set at $P < 0.05$. Data indicate that resistance training significantly ($P < 0.05$) decreased mRNA expression of NT4/5 in soleus muscle. However, no significant alteration was detected in FHL muscle ($P > 0.05$). Our results also indicate that no significant alterations were detected for TrkB mRNA expression in soleus and FHL muscles ($P > 0.05$). Decrease in mRNA expression of NT4/5 in soleus muscle may be as result of post-translation regulation following resistance training. Also, non-alteration in TrkB mRNA expression was indicated in probable roll of P75 receptor.

Keywords : neurotrophin-4/5 (NT-4/5), TrkB receptor, resistance training, slow and fast muscles

Conference Title : ICSMES 2014 : International Conference on Sport Medicine and Exercise Science

Conference Location : Venice, Italy

Conference Dates : June 19-20, 2014