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The effect of 8 weeks SIT training on neurotrypsin and agrin in skeletal muscles of aged male wistar rats

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Aging is associated with impairment of various biological functions, such as decreases in muscle mass, strength, cellular protein synthesis that called sarcopenia.the deterioration of skeletal muscle function is one of the primary consequences of aging and sarcopenia(1). Aging can cause to a great decline in the function of neuromuscular System (2,3,4).One of the important factor in neuromascular system that causes result in sarcopenia is neurotrypsin. Neourotrypsin is a neural biomarker that released from brain, axon and motor neuron and can cause Agrin and neuromascular junction(NMJ) deterioration specially in aged people(2,3). The purpose of the present study was to study of the effect of 8 weeks SIT training on neurotrypsin and agrin in skeletal muscles in aged male wistar rats.

Methodology: For this purpose 20 aged wistar rats (24 month) after one week familiarization with laboratory condition randomly classified in control group (n=10) and SIT group(n=10). SIT training protocol was interval progressive treadmill running for 8 weeks and 3 session per week and 7 time per session with 2 minute rest time between each interval. Control group sustained in laboratory condition without any training. Forty-eight hours after the latest session of training period animals were anesthetized with ketamine and xaylazin and soleus and extensor digitrum lungous (EDL) muscles quickly removed. After that extracted tissues frozen with liquid nitrogen and then stored at -80oC until analysis. Western blot assay used for determining of protein changes in muscles tissue and independent T-test used for analyzes of data.

Results: In relation to the SIT training effect on neurotrypsin and agrin protein results showed that neurotrypsin amount of soleus and EDL muscles in compare to control groups significantly decreased ($p \leq 0.001$) and also agrin amount of soleus and EDL muscles in compare to control group increased significantly($p \leq 0.001$).

Conclusion: Neourotrypsin is a neural biomarker that released from brain, axon and motor neuron. Since increase of releases of neurotrypesin can cause agrin degeneration and neuromascular junction(NMJ) deterioration specially in aged people, therefore the results of our study demonstrate that, 8 weeks SIT training decreased neurotrypsin in NMJ. This findings are consistent with other animal studies(6).For example, Ghadimi and Nourshahi (2016) reported neurotrypsin reduction followed by progressive resistant training (5). This finding confirms the SIT training can prevent NMJ degeneration by decreasing of neurotrypsin releasing to NMJ. The results of this study also showed that after 8 weeks SIT training, agrin increased in NMJ. with respect of this finding we can conclude that SIT training can improve agrin structurally and functionaly in NMJ.in related to training effect to argrin Ghadimi and Nourshahi (2016) found that progressive resistant training can increase agrin in NMJ(2). They also reported that resistant training by provoking of agrin releasing can prevent NMJ deterioration(2,5).In conclusion, these findings show that the SIT training can prevent sarcopenia bye prevent of releases of neurotrypsin to NMJ. Further studies needed to develop interventions for NMJ deterioration and sarcopenia.

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