Abstract

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Effect of DHEA on recovery of muscle atrophy induced by Parkinson's disease.

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Abstract

PURPOSE: The purpose of this study was to determine the effect of dehydroepiandrosterone (DHEA) on recovery of muscle atrophy induced by Parkinson's disease.

METHODS: The rat model was established by direct injection of 6-hydroxydopamine (6-OHDA, 20μg) into the left striatum using stereotaxic surgery. Rats were divided into two groups; the Parkinson's disease group with vehicle treatment (Vehicle; n=12) or DHEA treatment group (DHEA; n=22). DHEA or vehicle was administrated intraperitoneally daily at a dose of 0.34 mmol/kg for 21 days. At 22-days after DHEA treatment, soleus, plantaris, and striatum were dissected.

RESULTS: The DHEA group showed significant increase (p<.01) in the number of tyrosine hydroxylase (TH) positive neurons in the lesioned side substantia nigra compared to the vehicle group. Weights and Type I fiber cross-sectional areas of the contralateral soleus of the DHEA group were significantly greater than those of the vehicle group (p=.02, p=.00). Moreover, extracellular signal-regulated kinase (ERK) phosphorylation significantly decreased in the lesioned striatum, but was recovered with DHEA and also in the contralateral soleus muscle, Akt and ERK phosphorylation recovered significantly and the expression level of myosin heavy chain also recovered by DHEA treatment.

CONCLUSION: Our results suggest that DHEA treatment recovers Parkinson's disease induced contralateral soleus muscle atrophy through Akt and ERK phosphorylation.

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