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Beneficial effect of exercise on muscle regeneration in a model of ischemia reperfusion injury (IRI)

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The aim of this study was to explore the effect of exercise on skeletal muscle performance and muscle regeneration following IRI. Rats were divided into 5 groups: Control group (I), IRI group with 2 hours reperfusion (IIa), IRI group with 2 weeks recovery (IIb), swimming exercise trained group followed by IRI with 2 hours reperfusion (IIIa) and swimming exercise trained group followed by IRI with 2 weeks recovery (IIIb). Muscle performance physiological parameters [peak twitch tension (Pt), peak tetanic tension (PTT) and fatigue resistance (FR) time] as well as neonatal MHC and CK were assessed in the gastrocnemius muscle. Additionally, the muscle was histologically examined, morphologically studied to detect percentage area of regenerating muscle fibers and immunostained to detect α SMA. Rats that performed regular swimming exercise followed by IRI with 2 hours reperfusion or 2 weeks recovery showed a significant improvement in the muscle contractile parameters compared to the untrained group evidenced by the significant elevation in Pt and PTT and significant prolongation in the FR time. Muscle regeneration was significantly improved in the trained injured group with 2 weeks recovery compared to the untrained group with 2 weeks recovery as evidenced by the significant increase in neonatal MHC gene expression and by the positive areas of regeneration and the significant increase in α SMA. In conclusion, exercise exerted a partial protective role against skeletal muscle dysfunction following IRI through the improvement of skeletal muscle regeneration.

Biography

NohaFouad El Hadary has completed her Master's degree in the field of Molecular Physiology in the year 2013 from the German University in Cairo, Egypt. She is currently employed as an Assistant Lecturer in the Physiology Department in the same university. Her field of expertise includes but not limited to exercise immunology, cytokines, muscle physiology and regeneration, immunostaining, measuring physiological parameters especially for muscle performance and use of various computers based software for data acquisition.

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