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Main Article

Exercise training improves the soleus muscle morphology in experimental diabetic nerve regeneration

1. Tais Malysz PhD^{1,2},
2. Jocemar Ilha PhD^{1,2},
3. Patrícia Severo do Nascimento MS^{1,2},
4. Maria Cristina Faccioni-Heuser PhD^{1,2},
5. Kátia De Angelis PhD³,
6. Beatriz D'agord Schaan MD, PhD^{1,4},
7. Matilde Achaval MD, PhD^{1,2,*}

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Author Information

¹ Programa de Pós-Graduação em Neurociências, Instituto de Ciências Básicas da Saúde, Universidade Federal do Rio Grande do Sul, RS, Brasil

2 Laboratório de Histofisiologia Comparada, Departamento de Ciências Morfológicas, Instituto de Ciências Básicas da Saúde, Universidade Federal do Rio Grande do Sul, Sarmiento Leite 500, CEP 90050-170, Porto Alegre, RS, Brasil

3 Laboratório de Movimento Humano, Universidade de São Judas Tadeu, São Paulo, SP, Brasil

4 Serviço de Endocrinologia, Hospital de Clínicas de Porto Alegre, Universidade Federal do Rio Grande do Sul e Instituto de Cardiologia do Rio Grande do Sul, Fundação Universitária de Cardiologia Porto Alegre, RS, Brasil

Email: Matilde Achaval MD, PhD (achaval@ufrgs.br)

*Programa de Pós-Graduação em Neurociências, Instituto de Ciências Básicas da Saúde, Universidade Federal do Rio Grande do Sul, RS, Brasil

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Keywords:

exercise training; experimental diabetes; muscle morphometry; muscle ultrastructure; nerve regeneration

Abstract

Introduction:

In this study we evaluate the effects of exercise training (10 weeks) on soleus muscle morphology in diabetic nerve regeneration after injury by sciatic nerve crush.

Methods:

Wistar rats were assigned to either a non-diabetic ($n = 6$), non-diabetic injured ($n = 6$), diabetic ($n = 6$), diabetic injured (DC; $n = 9$), or trained diabetic injured group (TDC; $n = 7$). Muscle transverse sections were used for morphometric and ultrastructural analyses.

Results:

Higher fiber density and smaller average myofiber area were observed in the DC and TDC ($P < 0.05$) groups compared with the other groups. This atrophic pattern was partially reversed in TDC. There was misalignment of the sarcomeres and structural alterations in the blood vessels, sarcolemma, nucleus, and mitochondria in the DC animals. The myofibers and blood vessels had a similar normal appearance in the TDC group. In addition, polyribosomes, rough sarcoplasmic reticulum, developed Golgi apparatus, and new myofibrils were observed.

Conclusions:

Sciatic nerve injury was found to promote soleus muscle atrophy and ultrastructural alterations in experimental diabetic nerve regeneration, which were partially reversed by exercise training. *Muscle Nerve*, 2011

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- [All Authors \(/advanced/search/results?searchRowCriteria\[0\].queryString="Tais Malysz" "Jocemar Ilha" "Patr%C3%ADcia Severo do Nascimento" "Maria Cristina Faccioni-Heuser" "K%C3%A1tia De Angelis" "Beatriz D'agord Schaan" "Matilde Achaval"&searchRowCriteria\[0\].fieldName=author&start=1&resultsPerPage=20\)](/advanced/search/results?searchRowCriteria[0].queryString=)