PROTEOMIC ANALYSIS OF ELDERLY GASTROCNEMIUS RATS SUBMITTED TO STRENGTH TRAINING

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INTRODUCTION AND OBJECTIVE: Sarcopenia consists in a multifactorial process characterized by a force and skeletal muscle mass decreased. In that case, strength training (ST) have been indicated for reducing aging deleterious effects and further promoting an increasing in strength. In such case, the modifications of muscle proteomic after ST in older animals are poorly studied. This work aims to evaluate the expression of gastrocnemius proteins from aged animals after ST and to increase the knowledge about the effects of exercise over aging.

MATERIAL AND METHODS: Twenty-four Rattus norvegicus were divided into 4 groups including young sedentary (YS), young trained (YT), old sedentary (OS) and old trained (OT). A 12-week ST was conducted where rats were adapted to strength training protocol climbing a vertical ladder with weight tail attached. The training sessions consisted of four ladder climbs with 65, 85, 95 and 100% of the rat maximal carrying capacity as determined in the previous session. Afterwards, gastrocnemius muscle was extracted and proteinaceous compounds were analyzed by fast type-high efficiency liquid chromatography, Shimadzu, linked on a mass spectrometer type micrOTOF ESI-Q III. All samples were performed in triplicate and further identified by using Uniprot / Swissprot database.

RESULTS AND DISCUSSION: Proteomic data showed the presence of 155 proteins identified, being 112 common to all groups including proteins related to mitochondrial metabolism, transport and structural functions. Otherwise proteins related to stress oxidative and transport, such as peroxiredoxin-6 and sero transferrin were differentially expressed in sedentary aging group. Moreover, in old trained group, proteins such as glycogen fosforilase suggesting an increase of glycolytic metabolism. CONCLUSION: In conclusion, biological aging is capable of modify muscle protein profile related to oxidative stress and muscle atrophy. Otherwise, ST increased metabolic proteins associated with energy metabolism during the aging process.

Keywords: Sarcopenia; strength training; proteomic
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