

Expression of PGC-1 Alpha Isoforms in Response to Eccentric and Concentric Resistance Training in Healthy Subjects

Authors : Pejman Taghibeikzadehbadr

Abstract : Background and Aim: PGC-1 alpha is a transcription factor that was first detected in brown adipose tissue. Since its discovery, PGC-1 alpha has been known to facilitate beneficial adaptations such as mitochondrial biogenesis and increased angiogenesis in skeletal muscle following aerobic exercise. Therefore, the purpose of this study was to investigate the expression of PGC-1 alpha isoforms in response to eccentric and concentric resistance training in healthy subjects. Materials and Methods: Ten healthy men were randomly divided into two groups (5 patients in eccentric group - 5 in concentric group). Isokinetic contraction protocols included eccentric and concentric knee extension with maximum power and angular velocity of 60 degrees per second. The torques assigned to each subject were considered to match the workload in both protocols, with a rotational speed of 60 degrees per second. Contractions consisted of a maximum of 12 sets of 10 repetitions for the right leg, a rest time of 30 seconds between each set. At the beginning and end of the study, biopsy of the lateral broad muscle tissue was performed. Biopsies were performed in both distal and proximal directions of the lateral flank. To evaluate the expression of PGC1 α -1 and PGC1 α -4 genes, tissue analysis was performed in each group using Real-Time PCR technique. Data were analyzed using dependent t-test and covariance test. SPSS21 software and Exell 2013 software were used for data analysis. Results: The results showed that intra-group changes of PGC1 α -1 after one session of activity were not significant in eccentric (p = 0.168) and concentric (p = 0.959) groups. Also, inter-group changes showed no difference between the two groups (p = 0.681). Also, intra-group changes of PGC1 α -4 after one session of activity were significant in an eccentric group (p = 0.012) and concentric group (p = 0.02). Also, inter-group changes showed no difference between the two groups (p = 0.362). Conclusion: It seems that the lack of significant changes in the desired variables due to the lack of exercise pressure is sufficient to stimulate the increase of PGC1 α -1 and PGC1 α -4. And with regard to reviewing the answer, it seems that the compatibility debate has different results that need to be addressed.

Keywords : eccentric contraction, concentric contraction, PGC1 α -1 □ PGC1 α -4, human subject

Conference Title : ICEPSB 2022 : International Conference on Exercise Physiology and Sports Biomechanics

Conference Location : London, United Kingdom

Conference Dates : June 27-28, 2022