



## Aerobic exercise, BFR and mitochondrial dynamics of human skeletal muscle

*Keynote Speaker*

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### Abstract

**Introduction:** Aerobic exercise with blood flow restriction (BFR) plays an important role in skeletal muscle adaptation; however, the effects of this type of exercise on proteins associated with mitochondrial dynamics is unclear. Therefore, the purpose of this study was to investigate the effect of aerobic exercise with and without BFR on mitochondrial dynamic of human skeletal muscle.

**Methods:** The method of this study was semi experimental with pre-test and post-test design, which was carried out in cross-over design. For this purpose, five young men (age:  $33.4 \pm 2.30$ , weight:  $79.64 \pm 10.49$ , BMI:  $26.24 \pm 2.27$ ) performed two aerobic exercise intervention with BFR and without BFR (C) in two separate days. The aerobic exercise included 5 bouts of 2-min aerobic activities at speeds of 50 meters per minute and 1 min active rest between the bouts which performed with and without BFR. Immediately after the subjects' activity, they were rested in the medical bed and the second blood sample was taken, followed by 60 minutes and 120 minutes after the second activity again. Finally, 3 hours after the second biopsy, 3 cm away from the first biopsy site, the subjects were evaluated. The biopsy was taken from the lateral part of the Vastus Lateralis muscle. Western Blot method was used to measure the protein levels of MFN2 and DRP1 of skeletal muscle. Data analysis were performed using analysis of variance with repeated measures and t- test at a significant level of 0.05.

**Results:** The results of the data analyze showed that both aerobic exercise with and without blood flow restriction significantly increased MFN2 and significantly decreased DRP1 3 hours after exercise compared to the pre-test ( $P < 0.05$ ). Also, aerobic exercise with BFR has a significant effect on MFN2 elevation and DRP1 decrease in compared to aerobic exercise without BFR ( $P < 0.05$ ). **Conclusion:** Based on the findings of this study, it seems that aerobic exercise with BFR is a strong stimulant for the improvement of mitochondrial dynamics

### Keywords

Aerobic exercise; blood flow restriction; mitochondrial dynamic; DRP-1; MFN-2

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