

## VEGF response to aerobic training in postmenopause: walking training vs nordic walking

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Menopausal transition leads to increased risk of non-communicable chronic diseases, which are characterized by endothelial disruption and dysfunction. Aerobic physical exercise determines an increase of vascular endothelial growth factor (VEGF), a signal protein that stimulates angiogenesis, and recent studies suggest a direct correlation between exercise intensity and VEGF production (1). However, high intensity training is often not recommended for postmenopausal women as a result of cardiovascular and orthopaedic contraindications. The aim of the study was to determine if exercising at the same intensity (i.e. moderate intensity) but involving a more extended muscle mass might induce higher circulating levels of VEGF. Nordic Walking (NW), a form of physical activity where the active use of a pair of dedicated poles is added to regular walking, was compared to walking training (WT). Thirty postmenopausal women were enrolled in the study (57.93±3.55 years old) and randomly assigned to WT (n=15) and NW (n=15). Serum VEGF levels were determined by ELISA before and after exercise training, consisting in three workouts of 40-50 minutes for 13 weeks at intensity between 11 and 13 of a 15-category scale of the ratings of the perceived exertion. The only difference was the use of poles with appropriated technique in NW group. RM-ANOVA with repeated measure for the factor time revealed an effect for time ( $P=.01$ ) and an interaction effect time x group ( $P=.041$ ). Post-hoc analysis, consisting in a paired sample t-test for each group, showed that NW increased VEGF whereas WT showed only a tendency (WT:  $T_0=39.68\pm 2.90$   $T_1=40.22\pm 2.56$ ,  $P=.012$ ; NW:  $T_0=38.22\pm 1.60$   $T_1=42.52\pm 5.97$ ,  $P=.57$ ). In conclusion, independently from exercise intensity, NW seems to increase VEGF more efficiently than WT, probably as a result of a larger capillary bed actively involved by exercising muscles. This outcome should be taken in consideration when programming exercise training for postmenopausal women.

### References

- [1] Whal et al. (2011) Effects of acid-base balance and high or low intensity exercise on VEGF and bFGF. *Eur J Appl Physiol.* 111(7):1405-13. doi: 10.1007/s00421-010-1767-1.

### Keywords

VEGF; Nordic Walking; menopause.