EFFECTS OF IL-6 POLYMORPHISM ON EXERCISE PERFORMANCE

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Skeletal muscle-derived interleukin-6 (IL-6) is a pleiotropic cytokine which plays a major role in mediating metabolism during strenuous physical exercise. In this study we examined the effect of IL-6 promoter region polymorphism (C-174G) on maximal oxygen uptake (VO2max), body mass index (BMI) and plasma IL-6 levels.

Methods: In this pilot study, 54 healthy Finnish military recruits were studied for 8 weeks during their basic training period which includes intensive physical training. At 1, 5 and 8 weeks, anthropometric measurements and VO2max determinations were performed. Plasma IL-6 levels were measured at the same time points, before and after submaximal walking tests. The single nucleotide polymorphism (SNP) C-174G in the promoter region of IL-6 gene was genotyped from peripheral blood-derived DNA, and the subjects were further divided into subgroups according to their genotypes.

Results: C allele of the IL-6 SNP was associated with slightly higher plasma levels of IL-6, but there was no statistically significant difference between the genotype groups. During the training period, VO2max increased significantly in all genotype groups. The greatest changes in the VO2max changes were observed among individuals with CG-genotype, whose VO2max also was the lowest. The BMI decreased only in those subjects who had at least one C allele.

Conclusion: The C allele of the IL-6 promoter SNP seemed to influence plasma IL-6 levels. Exercise training improved VO2max levels and decreased BMI. Our results suggest that training effect is possibly influenced by IL-6 genotype.

Keywords: BMI, Physical Fitness, Genotype