

Monitoring of cardiovascular risk factors in competitive athletes

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It is well known that physical activity can improve cardiovascular risk factors, but it is also true that strenuous activity may result detrimental for the athlete health. Among the emerging markers of cardiovascular risk, plasma homocysteine (Hcy) plays a prominent role, since it has been shown its significant increase in competitive athletes. Some research has concluded that Hcy levels may be influenced by the duration, intensity and type of exercise, whereas other studies have identified lifestyle factors, such as smoking, eating habits, alcohol consumption, age, elevated blood pressure and genetic factors, as factors that contribute to increased plasma concentrations of Hcy. Polymorphisms in the methylenetetrahydrofolate reductase gene (MTHFR) (677C/T, 1298A/C) are reported to modulate homocysteine levels.

The aim of this work was to identify a genetic profile of risk for cardiovascular disease in two populations of competitive athletes, football players ($n = 19$) and those engaged in athletics ($n=37$). The distribution of MTHFR A1298C and C677T polymorphisms was examined by Real-time PCR allelic discrimination on genomic DNA isolated from lymphocytes of whole peripheral blood. The serum levels of Hcy were determined by HPLC method, while vitamin B12 and folate by RIA technique. The data showed that 50% of the subjects in both groups are carrier of MTHFR C677T polymorphism either in heterozygous or homozygous state. In addition, all subjects had mild hyperhomocysteinemia (13-27 micromol/L). The highest mean levels of Hcy were recorded in the football players, and the differences compared to those engaged in athletics were very significant (21.8 ± 11.6 vs. 13.5 ± 6.6 , $p < 0.05$). The increase of Hcy could be ascribed mainly to the diet style of the recruited subjects, characterized by a high consumption of red meat and very low intake of B vitamins. Moreover, this increase may also be explained in relation to the type of exercise required in football, that is considered an intermittent intensity sport. The preliminary results of this study suggest that screening for the MTHFR variants C677T and A1298C should be included in the panel of screening for cardiovascular risk in competitive athletes.

References

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Keywords

Homocysteine, cardiovascular risk factors, competitive athletes.