It is known that principal causes of increased level of serum homocysteine are presence of genetic defects of enzymes catalyzing metabolic pathways and insufficiency of vitamins (folate, B2, B6, B12). In this connection hyperhomocysteinemia can be hereditary or not. Hereditary hyperhomocysteinemia develops owing to defects of enzymes cystatione-beta-synthase or methylenetetrahydrofolate reductase (MTHFR). A common 677C-T transition in the MTHFR gene results in a thermolabile variant with specific decreased enzymic activity, and is well established as a genetic determinant of hyperhomocysteinemia. The purpose of the present work was to reveal a group of athletes with hereditary predisposition to hyperhomocysteinemia and to study serum homocysteine (HC) concentration during physical load. 78 students of special Olympic college of Saint-Petersburg, 15-20 years old engaged in wrestling participated in the study. Polymorphism of MTHFR gene was determined by polymerase chain reaction with the subsequent restriction of amplificated products with Hinf1. Concentration of serum HC was determined by immune enzymatic essay test (Axis, Norway). Blood for the analysis was carried twice: in a condition of relative rest (after 12-hour overnight fast) and after specific physical loading. According to genetic analyses of MTHFR it was revealed, that among the athletes 45 persons (57.7 %) have CC genotype, 26 person (33.3 %) are heterozygous (CT genotype) and 7 sportsmen (9 %) are homozygous on T allele of the given gene. Frequency of mutant allele occurrence corresponds to average distribution on the European population. Average serum HC concentration of the surveyed sportsmen, who are homozygous representatives on C allele of gene MTHFR and heterozygous does not differ in a condition of relative rest and was 9.8 ± 1.8 micro mole and 9.3 ± 3.4 micro mole, accordingly. At sportsmen – carriers of T/T genotype HC concentration were 15.5 ± 0.5 micro mole, that values physiological norm for this metabolite in serum. After specific physical training serum HC concentration of sportsmen – carriers of CC and CT genotypes was 12.3 ± 1.3 micro mole and 13.7 ± 1.9 micro mole, accordingly. At sportsmen homozygous on T allele, HC concentration in serum raised to 16.9 ± 0.5 micro mole. Thus, 9 % of young wrestlers – carriers of T/T genotype on gene MTHFR have the tendency to higher level of serum HC at rest and during exercise. Numerous researches have shown that homocysteine (HC) accumulation can be considered as the factor of the increased risk of an atherosclerosis and a heart attack. So these athletes are the cardiovascular diseases, risk group. It is known, that folate plays the major role in normal homocysteine level and the risk group is needed to folate status correction for prevention of future pathology.