Association between a beta2-adrenergic receptor polymorphism and elite endurance performance.

The Arg16Gly single nucleotide polymorphism of the human beta(2)-adrenoceptor (ADRB2) gene was evaluated in a case-control study that included 313 white male elite endurance athletes and 297 white male sedentary controls (SCs) recruited in a multicenter project from North America, Finland, and Germany. The groups were matched by country of origin. The elite endurance athletes were required to have a maximum oxygen uptake \( \geq 75 \) mL.kg\(^{-1}\).min\(^{-1}\) (mean [SD], 79.0 [3.5]), whereas SC subjects had to be sedentary with a measured maximum oxygen uptake \( \leq 50 \) mL.kg\(^{-1}\).min\(^{-1}\) (40.1 [7.0]).

Polymerase chain reaction technique was used to amplify the single nucleotide polymorphism-containing region in codon 16 of the ADRB2 gene. ADRB2 genotypes were in Hardy-Weinberg equilibrium in both groups. Genotypes did not differ between countries or sports of the athletes. The chi\(^2\) analysis for the genotype distribution showed a significant difference between the 2 cohorts (\( P = .030 \)), suggesting a positive association between the tested Arg16Gly polymorphism and endurance performance. Comparing carriers vs non-carriers for the 2 alleles, an excess of Gly allele carriers was seen in the SC group (\( P = .009 \)), indicating an unfavorable effect of the Gly allele with respect to the performance status. In conclusion, we
found suggestive evidence that the Arg16Gly polymorphism in the gene encoding for the beta(2)-adrenergic receptor may associate with endurance performance status in white men.