

No association between Angiotensin Converting Enzyme (ACE) gene variation and endurance athlete status in Kenyans

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Abstract

It is well established that environmental factors are important in the success of east African runners in international distance running. The extent to which genetic factors influence this phenomenon is unknown. **Purpose:** Perhaps the most studied of genetic variants thought to influence human physical performance is the I/D polymorphism in the Angiotensin Converting Enzyme (ACE) gene. The I/D polymorphism is characterized by the presence (I) or absence (D) of a 287 base pair intronic fragment. The I allele is associated with lower tissue and circulating ACE levels, and also with endurance performance. However, ACE gene performance association studies have, to date, been confined to Caucasian populations. The present study aimed to assess the association between variation in the ACE gene and elite endurance athlete status in an African population successful in distance running.

Methods: DNA samples were obtained from 226 national level Kenyan athletes (N), 70 international Kenyan athletes (I), and 85 members of the general Kenyan population (C).

Results: I/D genotype was significantly associated with circulating ACE activity ($P = 0.034$), explaining almost 13% of the variation in ACE levels. I/D genotype was not associated with elite endurance athlete status ($df = 4$, $\chi^2 = 3.5$, $P = 0.47$) with no over-representation of the I allele among N (0.42) or I (0.39) athletes relative to controls (0.38).

Conclusion: The absence of an association between the I/D polymorphism with elite Kenyan athlete status suggests that the ACE gene does not contribute significantly to the phenomenal success of Kenyan endurance runners in international distance running. These results do not support the hypothesis that ACE gene variation is associated with elite endurance performance.

Key Words: ACE gene, Kenyan runners, I/D polymorphisms