East African runners are continually successful in international distance running. The extent to which genetic factors influence this phenomenon is unknown. The insertion (I) rather than deletion (D) of a 287 bp fragment in the human angiotensin converting enzyme (ACE) gene is associated with lower circulating and tissue ACE activity and with endurance performance amongst Caucasians. To assess the association between ACE gene variation and elite endurance athlete status in an African population successful in distance running, DNA samples were obtained from 221 national Kenyan athletes (N), 70 international Kenyan athletes (I), and 85 members of the general Kenyan population (C). Blood samples were obtained from C and assayed for circulating ACE activity. ACE I/D (rs????—from NCBI SNPdb first time poly mentioned) genotype was determined, as was genotype at A22982GD (rs????—from NCBI SNPdb first time poly mentioned) which has been shown to associate more closely with ACE levels in African subjects than the I/D polymorphism. ACE I/D and A22982G genotypes explained 13 and 24% of variation in circulating ACE activity levels ( P=0.034 and <0.001 respectively). I/D genotype was not associated with elite endurance athlete status (df =4, v2=4.1, P=0.39). In addition, genotype at 22982 was not associated with elite endurance athlete status (df =4, v2=5.7, P=0.23). Nor was the A allele at 22982, which is associated with lower ACE activity, more prevalent in N (0.52) or I (0.41) relative to C (0.53). We conclude that ACE I/D and A22982G polymorphisms are not strongly associated with elite endurance athlete status amongst Kenyans.