

NO ASSOCIATION OF α -ACTININ-3 (ACTN3) AND VITAMIN D RECEPTOR (VDR) GENOTYPES WITH SKELETAL MUSCLE PHENOTYPES IN YOUNG WOMEN

Original scientific paper

Abstract

This study investigated association between polymorphisms of α -actinin-3 (ACTN3) and vitamin D receptor (VDR) genes, and the skeletal muscle phenotypes; sprint performance, jump capacity, and knee extensor and flexor strength. Sixty-two non-resistance trained Caucasian females (mean \pm SD; 21 \pm 4 years) completed 15 m sprint, standing vertical jump, knee extensor and flexor isometric maximal voluntary contraction (MVC) tests. 15 m sprint and vertical jump were assessed using infrared timing gates and a piezoelectric force platform respectively, with knee extensor and flexor strength assessed using isokinetic dynamometry. ACTN3 R577X and VDR BsmI polymorphisms were determined using real-time polymerase chain reaction (PCR). A one-way analysis of variance (ANOVA) was used to examine differences between skeletal muscle phenotypes for the ACTN3 and VDR genotypes. 15 m sprint (ACTN3: RR = 2.87 \pm 0.17 s, RX = 2.92 \pm 0.22 s, XX = 2.95 \pm 0.17 s, P = 0.384; VDR: bb = 2.86 \pm 0.14 s, Bb = 2.96 \pm 0.23 s, BB = 2.85 \pm 0.21 s, P = 0.194) and standing vertical jump performance (ACTN3 P = 0.112; VDR P = 0.788) were not associated with ACTN3 or VDR genotypes. Neither was any association found between knee extensor MVC and ACTN3 (P = 0.120) or VDR genotypes (P = 0.978), or between knee flexor MVC and ACTN3 (P = 0.852) or VDR genotypes (P = 0.718). The ACTN3 R577X and VDR BsmI polymorphisms do not appear to substantially influence the function of skeletal muscle in Caucasian females.

Key words: Isokinetic dynamometry; polymorphism; MVC; exercise genetics; sprint time