Journal of Science and Medicine in Sport. 2014;17(1):102-106
Doi: http://dx.doi.org/10.1016/j.jsams.2013.02.005

$ACTN_3$ $R_{577}X$ polymorphism and team-sport performance: A study involving three European cohorts

Eynon N[1], Banting LK[2], Ruiz JR[3], Cieszczyk P[4], Dyatlov DA[5], Maciejewska-Karlowska A[6], Sawczuk M[6], Pushkarev VP[5], Kulikov LM[5], Pushkarev ED[5], Femia P[7], Stepto NK[8], Bishop DJ[8], Lucia A[9].

1. School of Sport and Exercise Sciences, Victoria University, Australia; Institute of Sport, Exercise and Active Living (ISEAL), Victoria University, Australia.
2. Institute of Sport, Exercise and Active Living (ISEAL), Victoria University, Australia.
3. Department of Physical Education and Sport, School of Sport Sciences, University of Granada, Spain.
4. Department of Tourism and Recreation, Academy of Physical Education and Sport in Gdansk, Poland.
5. Ural State University of Physical Culture, Russia.
6. Department of Physical Culture and Health Promotion, University of Szczecin, Poland.
7. Department of Biostatistics, School of Medicine, University of Granada, Spain.
8. School of Sport and Exercise Sciences, Victoria University, Australia; Institute of Sport, Exercise and Active Living (ISEAL), Victoria University, Australia.
9. Universidad Europea de Madrid, Spain.

Abstract:

OBJECTIVES: To determine the association between the α-actinin-3 (ACTN3) R577X polymorphism and elite team-sport athletic status in three cohorts of European team-sport athletes.
DESIGN: We compared the genotype and allele frequencies of the ACTN3 R577X (rs1815739) polymorphisms between team-sport athletes (n=205), endurance athletes (n=305), sprint/power athletes (n=378), and non-athletic controls (n=568) from Poland, Russia and Spain; all participants were unrelated European men.
METHODS: Genomic DNA was extracted from either buccal epithelium or peripheral blood using a standard protocol. Genotyping was performed using several methods, and the results were replicated following recent recommendations for genotype-phenotype association studies.
RESULTS: Genotype distributions of all control and athletic groups met Hardy-Weinberg equilibrium (all p>0.05). Team-sport athletes were less likely to have the 577RR genotype compared to the 577XX genotype than sprint/power athletes [odds ratio: 0.58, 95% confidence interval: 0.34-0.39, p=0.045]. However, the ACTN3 R577X polymorphism was not associated with team-sports athletic status, compared to endurance athletes and non-athletic controls. Furthermore, no association was observed for any of the genotypes with respect to the level of competition (elite vs. national level).
CONCLUSIONS: The ACTN3 R577X polymorphism was not associated with team-sport athletic status, compared to endurance athletes and non-athletic controls, and the observation that the 577RR genotype is overrepresented in power/sprint athletes compared with team-sport athletes needs to be confirmed in future studies.

Full text: http://dx.doi.org/10.1016/j.jsams.2013.02.005

Parc d’activités Activestre – 31 390 Carbonne – FRANCE
Tel.: +33 (0) 561 971 974 – Fax: +33 (0) 561 971 975
contact@innopsys.fr