Shotput performance and vastus lateralis fiber type composition

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Introduction
Shotput is a dynamic event demanding high power production. Recently it was shown that the % of type II fibers in
triceps brachii explains part of the performance in this event in moderately trained subjects (Terzis et al. 2003). The
purpose of the present study was to investigate the relationship between fiber type composition of vastus lateralis (a
protagonist muscle during the shotput) and shot put performance.

Methods
After a 2-week period of shot-put technique instruction, 22 male physical education students (age 21yrs, body height
180±5cm, body weight 81±9kg) signed an informed consent to participate in the study. They performed 3 shotput
trials with a 6-kg shot from the power position. On a separate day, fat free mass (FFM) was measured with dual
energy x-ray absorptiometry (Lunar DPX-MD). Muscle biopsies from right (dominant) vastus lateralis were obtained
and analyzed for fiber type composition and cross sectional area with ATPase histochemistry.

Results
Vastus lateralis % fiber type II area was not significantly related to shot-put performance (r=0.1, ns, figure 1). Shotput
performance was significantly correlated to whole-body FFM (r=0.7, p<0.01).

Discussion/Conclusion
Results of the present study suggest that in untrained subjects the fiber type composition of vastus lateralis does not
affect the shotput performance, perhaps because these subjects are not able to recruit their type II fibers during a
relative unknown movement. On the other hand, total muscle mass which is highly related to muscular strength,
significantly affects shot put performance in these subjects. We hypothesize that these relations would be enhanced
after a certain period of shot put training in the same subjects.

References