Letter to the Editor: Comment on “Time Course Effect of Static Stretching on Maximum Grip Strength”

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The JEPonline recently published a study by de Paula and colleagues (3) that examined the dose-response of stretch-induced muscular force deficits in grip strength in a small sample of male subjects. The rationale for the study and the interpretation of the results did not take into account numerous studies on this general topic and a specific study of this phenomenon using grip strength in a larger sample of males and females (6). This letter summarizes these errors and how these omissions influence the conclusions drawn by de Paula and colleagues. Improvements in clarity of writing and interpretation of their data would help the de Paula report contribute to the literature in this area.

The authors overstate a purported “controversy” over the impact of stretch-induced reductions in muscular performance. While this may have been true when this was first proposed in the literature in 1999 (5), this is certainly not the case in 2012. Over 60 studies have confirmed this effect in all domains of muscular performance in all ages and training levels of subjects. Hence, several review papers that have been published on this topic (1,7,11,12) are just some examples beyond the one cited by de Paul and colleagues.

While the vast majority of the studies focus on these effects in the lower extremity, it is also an overstatement to say that this phenomenon has not been extensively studied in the upper extremity. Other studies have been published confirming this phenomenon in the upper extremity (e.g.,6,8) beyond the two cited by de Paul. In fact, the first published study documenting the likely dose response of stretch-induced strength deficits was reported on measures of isometric grip strength in 2005 (6). In that study, both men and women had statistically significant and physiologically meaningful decreases in isometric grip strength after 40 sec of static stretching.
Several studies of this dose-response effect have followed and there are some mixed results as to what dose of stretching is required to decrease most forms of muscular performance (2,6,9,10,13), and how this knowledge should be implemented in exercise prescriptions. A recent meta-analysis (12) covers this topic well and reported pooled data supporting the hypothesis that lower stretch doses (<45 sec) significantly reduce muscular strength, muscular power, and high-speed strength.

Given these omissions of studies of the dose-response of stretch-induced strength deficits and the sample size used in the de Paul et al. (3) study, their conclusions should be interpreted with caution. Given the small sample size, it is likely that the non-significant trend (~20 N) of lower grip force following the 30 sec of stretch condition was a type II statistical error. It would have been more accurate for de Paula and colleagues to conclude something like: “The findings of the present study indicate that 60 sec of static stretching created a significant decrease in grip strength in these male subjects. We did not find evidence of a significant effect of 30 sec stretching that has been observed in other dose response studies. The present results and the mixed results of previous dose response studies at low stretching doses (less than 30 to 45 sec) argue for further research to confirm if lower doses of stretching also result in meaningful reductions in muscular performance.”

The de Paula et al. (3) study does add some new data in the area of the recovery from stretch-induced strength deficits. However, these results should have also been interpreted in the context of previous recovery studies. Irrespective of the nature of recovery of strength loses, one could argue with the application conclusions of the authors regarding athletes in field events since they have provided no evidence of a benefit of pre-activity stretching.

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