

Do core stabilization exercises enhance cycling efficiency?

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Abstract

Background: Core stabilization exercises have been advertised as potential enhancers of endurance and efficiency in cycling. A steady core is said to allow for proper body positioning, preventing unnecessary energy loss and will thus allow for maintaining speed and power for a longer time.

Previous studies published on core stabilization training in other sports show mixed results. However, no studies addressing a potential effect on gross cycling efficiency (GE) have been published.

Purpose: The aim of this pilot study was to analyze the possible effect of an eight week core-stability training program on trunk balance and gross cycling efficiency.

Methods: 13 well-trained cyclists were included in an 8 week core-stability training program. The daily program consisted of both static and dynamic versions of the plank, side plank, bird-dog, superman, cycling crunch and pulse up exercises lasting an average of 10 minutes per session.

Steady-state oxygen uptake and GE were determined as participants approached RER 1.0 (de Koning et al, 2012: Int J Sports Med, 33, 880–885). Grip-strength and the Y-balance test (Coughlan et al, 2012: J Athl Train, 47, 366–371) were used to measure balance. Training compliance was monitored using an online log. GE and core-stability measurements were performed at baseline and after 8 weeks.

Results: An improvement of gross cycling efficiency could not be found (average at baseline 22.0%; after training 22.5%; $p=0.26$). Compliance to the program was very good, with an average of 84% (75 – 98%) sessions trained. All participants demonstrated an improvement in postero-lateral reach. Three participants reported an episode of lower back discomforts which they attributed to the superman exercise.

Discussion: Our results did not show an improvement of GE after an 8 week core-stability training program. However, current sample size is small and reported values are very close to the +/- 2% error margin of the spirometry hardware used. In 2 participants, we were unable to accurately determine GE. According to our spirometry readings they were unable to attain a steady state in the second test. However, mentioned participants reported a perceived rate of exertion that was lower than expected at RER 1.0. The reason for this discrepancy is unknown. A possible measurement error can be assessed by measuring blood lactate in future tests.

Conclusion: As competitions can be won or lost in fractions of seconds, improving one's gross efficiency by means of core-stability training could be beneficial. The results of our current pilot study can be used to power future research in this area.

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