

Title: Is tramadol a performance enhancing drug? A randomised controlled trial.

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Introduction: Tramadol is a potent narcotic analgesic that acts on the opioid system. Data from the World Anti-Doping Agency (WADA) Monitoring Programme suggest tramadol is used in several sports to reduce exertional pain and confer a performance advantage. However, it is not included in WADA's Prohibited List. This study sought to identify whether tramadol enhances performance in time trial cycling.

Methods: Twenty-one highly trained cyclists (Age = 32 ± 10 years; Mass = 79.5 ± 11.7 kg; VO_2max = 57 ± 7 mL/kg/min; Peak Power Output = 436 ± 57 W) were screened for tramadol sensitivity through an online interview, and then attended the laboratory across three visits. The first visit identified VO_2max , Peak Power Output and Gas Exchange Threshold through a Graded Exercise Test. Between 3-14 days following this visit, participants returned to the laboratory on two further occasions to undertake cycling performance tests following the ingestion of either 100 mg of soluble tramadol (as 2x50 mg Zydol® tablets) or a taste-matched placebo control in a double-blind, randomised, and counter-balanced repeated measures design. The performance tests required participants to complete a 30 min non-exhaustive fixed intensity cycling task at a Heavy exercise intensity, immediately followed by a competitive self-paced 25-mile time trial (TT).

Results: Participants completed the TT significantly faster ($t_{20} = 2.87$, $p = 0.01$) in the tramadol condition (63 min 38 s $\pm$ 4 min 39 s) compared to the placebo condition (64 min 30 s $\pm$ 5 min 12 s).

Conclusion: In the current group of cyclists, the 1.3% faster time in the tramadol condition could confer a performance advantage sufficient to take a rider with a TT time in the third quartile, into a medalling position. The data from this study suggests that tramadol is a performance enhancing drug in time trial cycling.