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Pseudoephedrine and its Effect on Performance

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Abstract

Pseudoephedrine is a mild stimulant which partially mimics the action of noradrenaline and adrenaline. Recently, pseudoephedrine has been removed from the World Anti Doping Agency (WADA) prohibited substances list. This occurred despite limited research in regards to its effects on sporting performance, and no studies on prolonged exercise performance (>2hrs). There is some evidence to suggest pseudoephedrine may have an ergogenic effect at dosages exceeding therapeutic levels, possibly by masking fatigue. This study investigated the possible ergogenic effects of pseudoephedrine on endurance cycling performance.

Using a double blind, randomised cross over design, eight well-trained cyclists ($VO_{2max} 69 \pm 2 \text{ ml}\cdot\text{kg}^{-1}$) performed two self-paced performance time trials at least 6 days apart. Ninety minutes prior to the trial, subjects consumed either placebo or pseudoephedrine ($2.5 \text{ mg}\cdot\text{kg}^{-1}$) capsules. Diet and exercise were controlled for 48 hrs prior to each trial. The time trial required completion of a set amount of work, equivalent to riding at two and half hours at a power output calculated to elicit 70% VO_2 max. Power output was measured using a Powertap system (Cycle Ops Power, Saris Cycling Group, USA). Venous blood samples were collected prior to capsule ingestion, just before starting the trial, and at every 20% increment in completed work until completion and were analysed for glucose and lactate. Heart rate was recorded throughout the trial.

There was no significant effect of pseudoephedrine on average performance ($p=0.235$). Heart rate was significantly higher with pseudoephedrine consumption compared to placebo ($p<0.05$), but there was no significant difference in glucose or lactate between trials.

Pseudoephedrine does not significantly improve self-paced endurance cycling performance, though the individual response was variable. However, exercising heart rate was significantly higher during exercise after ingestion of the stimulant.

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The Central Regional Health and Disability Ethics Committee (CEN/07/05/032) approved testing procedures and written consent was obtained from all participants prior to commencing the study.

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