

PROJECT REVIEW

“Long-term effects of Beta2-agonists on skeletal muscle characteristics, hypertrophy and exercise performance in healthy trained males and elite athletes”

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Elite athletes have a high prevalence of asthma and asthma-like symptoms as well as a high use of anti-asthmatic therapy. Salbutamol and salmeterol, has been removed from the prohibited list and these drugs can now be used more freely, also by athletes with asthma-like symptoms only. Performance enhancing effects of beta2-agonists are, though, to some degree contradictory, and the scientific problems concerning beta2-agonists are as follows:

1. A recent systemic review by Pluim et al (2011), they points out that the current literature concerning possible performance enhancing effects of systemic beta2-agonists is weak and calls for future studies with the use of more reliable, valid and sensitive performance protocols.
2. Furthermore, Pluim et al (2011) showed that the training level of the participants in the salbutamol studies have been low to moderate, which is not representative for elite athletes.
3. In another recent review, Collomp et al (2010), reports that no studies, has thoroughly investigated the ergogenic effects of terbutaline after oral administration, neither on exercise performance nor on metabolic parameters and body composition.

Hypothesis:

Beta2-agonists have acute and chronic intracellular actions on skeletal muscle in animal studies, which could take place in human skeletal muscles as well, and by that induce 1) muscle strength and performance, and 2) increase volume of the muscles.

The therapeutic doses used in most former studies might have been too low to induce performance-enhancing action, whereas multi-pharmacy with the use of maximal allowed doses of each of the beta2-agonists might have additive effect. Acute use of mixed Beta2-agonists may enhance exercise performance in elite athletes.

Aim:

The aim is therefore to investigate acute, as well as, chronic effects of daily Beta2-agonists use on skeletal muscle hypertrophy, muscle fiber characteristics, intracellular adaptations and exercise performance in healthy trained and elite trained athletes.