

European Respiratory Society Annual Congress 2013

Abstract Number: 5282

Publication Number: P3956

Abstract Group: 4.1. Clinical respiratory physiology, exercise and functional imaging

Keyword 1: Exercise **Keyword 2:** Sport **Keyword 3:** Pharmacology

Title: Inhaled beta2-agonists increase power development in elite athletes

Mr. Morten 25739 Hostrup mortenhostrup@gmail.com^{1,2}, Mr. Anders 25740 Kalsen anderskalsen@gmail.com¹, Mr. Michael 25741 Kreiberg michaelkreiberg@gmail.com¹, Prof. Dr Jens 25742 Bangsbo jbangsbo@ifi.ku.dk² and Prof. Dr Vibeke 25743 Backer backer@dadlnet.dk MD¹.¹ Respiratory Research Unit, Bispebjerg University Hospital, Copenhagen, Denmark and ² Department of Nutrition, Exercise and Sports, University of Copenhagen, Copenhagen, Denmark .

Body: Background: The World Anti-Doping Agency no longer require athletes to provide clinical proof of asthma or exercise-induced bronchoconstriction for therapeutic inhalation of some beta2-agonists. Although several studies have ruled out performance-enhancing effects of inhaled beta2-agonists, combined inhalation of high doses of beta2-agonists within the current anti-doping regulations may increase performance in athletes. The aim of this study was to clarify this probability. Methods: In part I, asthmatic (n=9) and non-asthmatic (n=11) athletes, VO₂max 67.7±5.8 ml/min/kg (Mean±SD), were included. In part II, 7 national competitive elite cyclists, VO₂max 75.4±3.6 ml/min/kg, were included. Part I and II were conducted in randomized, double-blinded and placebo-controlled crossover designs. In part I, the subjects inhaled either salbutamol (1600µg)+terbutaline (4000µg), salbutamol (1600µg)+terbutaline (4000µg)+salmeterol (200µg)+formoterol (36µg) or placebo. In part II, the subjects inhaled salbutamol (1600µg)+formoterol (36µg)+salmeterol (200µg) or placebo. Following inhalation, the subjects were tested for isometric muscle strength of m.quadriceps, 6-s maximal sprinting, and time trial performance. Results: Inhalation of beta2-agonists increased (p<0.05) isometric muscle strength by 6.2±7.6% and power output (p<0.05) during the 6-s maximal sprints by 4.6±3.0% and 3.4±2.6%. Although inhalation of beta2-agonists increased (p<0.001) lung function (FEV₁) by 10.5±6.3% in asthmatic athletes, no benefits were observed on time trial performance compared with placebo. Conclusion: Inhalation of beta2-agonists within the current anti-doping regulations may provide a beneficial effect in sports requiring a high power development.