European Respiratory Society
Annual Congress 2013

Abstract Number: 5259

Publication Number: P3962

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

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

Title: Combined inhalation of beta2-agonists improves supramaximal exercise performance and muscle strength in elite swimmers

Mr. Anders 32549 Kalsen anderskalsen@gmail.com [1,2], Mr. Morten 32550 Hostrup mortenhostrup@gmail.com [1,2], Prof. Dr Jens 32551 Bangsbo jbangsbo@ifi.ku.dk [2] and Prof. Dr Vibeke 32552 Backer backer@dadlnet.dk MD [1]. [1] Respiratory Research Unit, Bispebjerg University Hospital, Copenhagen, Denmark and [2] Department of Nutrition, Exercise and Sports, University of Copenhagen, Copenhagen, Denmark .

Body: INTRODUCTION: The high prevalence of airway hyperresponsiveness (AHR) among elite athletes have lead to a high use of inhaled beta2-agonists. However, the potential ergogenic effects of beta2-agonists may lead to misuse by non-asthmatics to improve performance. The scope of this study was to investigate if combined inhalation of beta2-agonists within the current anti-doping regulations increase performance in elite swimmers. METHODS: Thirty elite swimmers (9 females), took part in the study. The subjects were assigned to either an airway hyperresponsive group (AG) (n=13) or a healthy group (HG) (n=17) based on AHR to mannitol. In a randomized double-blinded crossover study the subjects inhaled placebo or a combination of salbutamol (1600µg), formoterol (36µg) and salmeterol (200µg). The subjects were tested for endurance in a swim flume test to exhaustion at 110% of VO2max, followed by a 200 m arm ergometer sprint and a test of isometric muscle strength of m. quadriceps (MVC). Moreover, maximal inspiratory and expiratory pressures (MIP/MEP) were measured. RESULTS: Inhaled beta2-agonists increased ($p<0.05$) MVC in both groups from 567±56 to 594±61 in AG and 542±21 to 573±24N in HG. Furthermore, beta2-agonists improved ($p<0.05$) arm sprint in both groups from 57.01±1.66 to 56.02±1.75s in AG and 58.3±0.95 to 57.43 ±1.1s in HG. MIP and MEP increased ($p<0.05$) with beta2-agonists in both groups. No differences were observed in endurance during the exhaustive swim flume test with beta2-agonists. CONCLUSION: Inhalation of beta2-agonists within the anti-doping regulations increase muscle strength, sprint performance and respiratory muscle strength in elite swimmers.