

European Respiratory Society Annual Congress 2012

Abstract Number: 4659

Publication Number: P841

Abstract Group: 4.1. Clinical physiology and Exercise

Keyword 1: Exercise **Keyword 2:** Physical activity **Keyword 3:** Adolescents

Title: Factors associated with aerobic fitness in adolescents with asthma

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Body: Background: In adolescents with asthma, information on factors associated with aerobic fitness levels is limited. The present study aimed to determine if physical activity as well as skin fold thickness, asthma exacerbations, use of inhaled corticosteroids or lung function influences direct measurements of peak oxygen uptake (VO₂peak) in adolescents with asthma. Methods: From the general population based birth cohort, Environment and Childhood Asthma study in Oslo, Norway, in a nested case-control study 86 13-years old adolescents with and 76 without asthma performed maximal running on a treadmill with VO₂peak measured. The sum of four skin fold thicknesses was recorded, followed by wearing an activity monitor for four consecutive days. Lung function was measured by maximum forced expiratory flow-volume curves and body plethysmography. Asthma exacerbations and use of medication were registered by parental structured interview. Data were analyzed using multiple regression analysis. Results: Vigorous physical activity (coefficients with 95% confidence intervals; 1.73 (0.32, 3.14)) and body fat -0.35 (-0.41, -0.28)) were significantly associated with VO₂peak in adolescents with asthma. Neither use of inhaled corticosteroids, lung function nor number of asthma exacerbations was associated with VO₂peak when taking physical activity and skin fold thickness into account. In the adolescents without asthma only skin fold thicknesses was associated with VO₂peak. Conclusions: VO₂peak appears to be determined by vigorous physical activity level and skin fold thickness in Norwegian adolescents with asthma and not by asthma-related factors such as use of inhaled corticosteroids, lung function nor number of asthma exacerbations.