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Clinical studies in asthma

S7 ADIPOSITY AND ASTHMA, PULMONARY FUNCTION AND ATOPY IN 11-YEAR OLD CHILDREN: A BIRTH COHORT STUDY

doi:10.1136/thoraxjnl-2011-201054b.7

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Background Results of studies investigating the association between obesity and asthma, atopy and lung function have been inconsistent, in part due to the limitation of BMI in evaluating body adiposity.
Objectives To investigate the association between obesity and asthma, wheeze, atopy, lung function and bronchial hyper-responsiveness in children at age 11 years using bioelectrical impedance (BIA) and BMI.
Methods Children from the unselected birth cohort study attending follow-up at age 11 years had percent body fat (PBF) and truncal fat (PTF) assessed using BIA (Tanita BC-418). Weight and height were also measured. Current asthma and wheeze were derived from a validated respiratory questionnaire. Atopy was ascertained using skin prick testing. Lung function was assessed using spirometry and bronchial hyper-responsiveness by 5-step methacholine challenge according to ATS guidelines.
Results 646 children (339 male) completed anthropometric measurements. BMI z-score, PBF and PTF were associated with current wheeze (OR [95% CI]: 1.27 [1.03 to 1.57], p=0.03; 1.04 [1.00, 1.08], p=0.04; 1.04 [1.00, 1.08], p=0.04 respectively). BMI z-score, PBF and PTF were also associated with current asthma (1.30 [1.04 to 1.63], p=0.02; 1.04 [1.00 to 1.08], p=0.06; 1.04 [1.00 to 1.08], p=0.04). However, the effect of PBF and PTF appeared strongest in girls (PBF: 1.12 [1.04 to 1.20], p=0.004; PFT: 1.11[1.04 to 1.20], p=0.003; p=0.05 and p=0.04 for interactions respectively). Children were defined as normal or overweight according to BMI (23% overweight) and PBF (29.8% overweight) cut-offs; overweight children had an increased risk of asthma (BMI: 1.73 [0.99 to 3.02], p=0.05; PBF: 2.09 [1.23 to 3.32] p=0.006). This was highly significant in girls (BMI: 3.34 [1.43 to 7.83], p=0.005; PBF: 4.74 [1.98 to 11.35], p<0.001; p=0.05 and p=0.02 for interactions respectively). Increasing BMI was associated with increases in both FEV_1 and FVC but reductions in FEV_1: FVC ratios. This association was again stronger in girls than boys. No associations between adiposity and atopy or bronchial hyper-responsiveness were found.
Conclusion Higher BMI z-score, PBF and PTF were associated with increased risks of wheeze and asthma. This effect was stronger in girls. BIA measurements appeared to have stronger associations in girls with outcomes than BMI. This may reflect the ability of BIA to measure adiposity more accurately than BMI.

S8 SENSITIVITY OF IMPULSE OSCILLOMETRY AND SPIROMETRY IN THE ASSESSMENT OF BETA-BLOCKER INDUCED BRONCHOCONSTRICTION AND BETA-AGONIST BRONCHODILATATION IN MILD-TO-MODERATE ASTHMATICS

doi:10.1136/thoraxjnl-2011-201054b.8

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Introduction and Objectives Impulse oscillometry (IOS) is known to be a sensitive marker of airway dysfunction, but is commonly associated with a wider variation than spirometry. The effects of β-blocker induced bronchoconstriction on IOS have not been studied. We compared the sensitivities of IOS and spirometry in the assessment of bronchoconstriction to propranolol and bronchodilatation to salbutamol.
Methods Mild-to-moderate persistent stable asthmatics taking =1000 μg day budesonide or equivalent, received a single dose of 10 mg or 20 mg of oral propranolol followed by histamine bronchial challenge testing (PC10), with recovery to nebulised salbutamol (5 mg). Spirometry and IOS were measured pre and 2-h post β-blocker, post histamine and 20 min post salbutamol. Pre vs post % change (95% CI) values were compared and standardised response means (SRM) were calculated to assess the "signal to noise" of each test.
Results Thirteen patients (mean age, 34 years) completed per protocol: 11 received 20 mg of oral propranolol. All IOS indices showed a greater magnitude of response to propranolol (ie, as % change) compared to spirometry. After adjustment for test variability, in response to propranolol, SRM's for IOS outcomes were better than spirometry with the highest seen with R5 and *fres*. Likewise for the bronchodilator response to salbutamol the highest SRMs were also seen with R5 and *fres* (see Abstract S8 table 1).
Conclusions IOS is a more sensitive response outcome than spirometry with respect to bronchoconstriction to oral propranolol and bronchodilatation post salbutamol in mild-to-moderate asthmatics.

S9 INHALED AND SYSTEMIC CORTICOSTEROID RESPONSE IN MODERATE-TO-SEVERE ASTHMA ASSESSED BY EXTENDED EXHALED NITRIC OXIDE AND LUNG FUNCTION

doi:10.1136/thoraxjnl-2011-201054b.9

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Introduction and Objectives Alveolar nitric oxide (CANO) has been proposed as a potential biomarker of small airway inflammation in

Abstract S8 Table 1

	Bronchoconstriction		Bronchodilatation	
Outcome	**Mean % change (95% CI), p Value**	**Standardised response mean**	**Mean % change (95% CI), p Value**	**Standardised response mean**
Spirometry				
FEV_1 (l)	4.6% (1.9 to 7.3), p=0.009	0.86	31.5% (18.2 to 44.7), p<0.001	1.67
FEF_{25-75} (l)	6.2% (−0.2 to 12.6), p=0.116	0.47	57.9% (29.1 to 86.7), p<0.001	1.42
Impulse oscillometry				
R5 (Airway Resistance at 5 Hz) (kPa L/s) *(Total airway resistance)*	30.8% (14.01 to 47.6), p<0.001	1.32	45.8% (36.7 to 55), p<0.001	1.87
R5-20 (difference) *(Small airways resistance)*	104.1% (22.6 to 185.6), p=0.004	1.05	115.6% (55.6 to 175.7), p<0.001	1.43
AX (area) (Respiratory reactance)	118.5% (37.2 to 200), p=0.007	0.94	82.6% (73.9 to 91.3), p=0.001	1.26
fres (Resonant Frequency) (Hz)	39.4% (16.6 to 54.3), p=0.002	1.13	50.7% (40.7 to 60.8), p<0.001	2.13