Results All four biomarkers were positive in smear-positive TB, but SAA and CRP were less sensitive in smear-negative TB (see attached table). Even in the control group, there were positive tests for the four biomarkers. None of those with latent TB developed active disease, even though a proportion had a positive test.

Conclusion These four biomarkers did not distinguish between active and latent disease, and did not predict the development of active disease in those with latent TB infection.

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Clinical trials and outcome measures in paediatric lung disease

S64 EOSINOPHIL CATIONIC PROTEIN AND CYTOKINE ANALYSIS IN EXHALED BREATH CONDENSATE IN PAEDIATRIC ASTHMA

[1]A Whitehouse, [1]R Brugha, [1]N Mushtaq, [2]I Dundas, [1]J Grigg. *[1]Blizard Institute, Centre for Paediatrics, Queen Mary University of London, London, UK; [2]Barts and the London NHS Trust, London, UK*

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Background Sputum eosinophil counts are unstable in childhood asthma.[1] This makes sputum induction to quantify sputum eosinophils an unsuitable test to guide anti-inflammatory therapy.[2] While eosinophils may be cleared following apoptosis, free eosinophil granules, containing effector proteins, may persist in the airway lumen. We speculated that inflammatory mediators in exhaled breath condensate, released by eosinophils (such as eosinophil cationic protein (ECP)) could aid risk-profiling in children with asthma. We therefore sought to assess whether ECP is present in EBC from asthmatic children, alongside an assessment of pro-inflammatory cytokines.

Methods Children with asthma aged 7–15 and age matched healthy controls underwent spirometry, sputum induction, collection exhaled breath condensate (EBC), and completed the childhood asthma control test. Exhaled breath was tested for eosinophil cationic protein (ECP) using an immunoassay. A cytokine analysis of the exhaled breath condensate was also carried out in addition to a sputum leucocyte differential.

Exhaled breath condensate (EBC) was collected in an R-tube following manufacturer protocol,over 10 min.

Results Sputum leucocyte counts were performed in 33 children with asthma. Suitable samples (visible airway plugs) were obtained from 14 children at baseline who concurrently provided EBC samples. Of these, 7/14 (50%) were eosinophilic and 7/14 (50%) were non-eosinophilic. The cytokine analysis showed that IL-4 did not differ between groups. IL-13 was raised in children who had sputum eosinophilia (2.54 ± 1.18 vs. 0.87 ± 1.49 pg/ml, mean±sd, p = 0.0387, unpaired t-test).

Exhaled breath condensate was collected in 26 asthmatic children and 10 controls. ECP was detected in EBC from 5/26 asthmatic children and 0/10 healthy children. In 2 asthmatic children, detectable ECP was associated with sputum eosinophilia (>2.5%). In one child ECP was detectable with no induced sputum eosinophils. (Table 1).

Discussion ECP may be identified in EBC from children with asthma, and is not exclusively associated with concurrent sputum eosinophilia. Eosinophilia may be identified non-invasively by measuring Th2 cytokines in EBC. These techniques may provide additional insights into underlying airway inflammation and identify children who may benefit from specific anti-Th2 cytokine monoclonal antibody therapies.

Abstract S64 Table 1 Eosinophil cationic protein (ECP) assay using exhaled breath. The threshold for detection in the assay was 50.7 pg/ml

Patient	Mean ECP (pg/ml)	Sputum Eosinophils (%)
Child 1	65	(unknown)
Child 2	505	18.96
Child 3	134	6.2
Child 4	1113	0.21
Child 5	1307	0.0

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S65 URINARY PROSTAGLANDINS AS INFLAMMATORY MARKERS FOR CHILDHOOD ASTHMA EXACERBATIONS

[1]R Brugha, [1]N Mushtaq, [1]I Dundas, [2]M Sanak, [1]J Grigg. *[1]Queen Mary, University of London, London, UK; [2]Jagiellonian University Medical School,, Krakow, Poland*

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Background Measuring inflammation (inflammometry) may assist decisions regarding preventative anti-inflammatory therapies in asthma.[1] Prostaglandin metabolites, which reflect airway inflammation, may be measured in urine samples.[2] We sought to prospectively assess associations between urine prostaglandins and subsequent asthma exacerbations in children, and to compare these markers to current markers that aim to predict future risk.

Methods Children with asthma aged 7–15 underwent spirometry, sputum inductions, completed the childhood asthma control test (C-ACT) and provided urine samples at baseline. Urine was also provided by healthy (non-atopic) controls. Urine PGD, PGE and PGJ metabolites were measured using HPLC-MS. At 3 months, sampling was repeated, data was collected on exacerbations (unscheduled medical attendance or day missed from school due to asthma symptoms) and the receiver operator characteristic was calculated for the baseline assessment.

Results 73 children (asthma n = 25, controls n = 48) were included. Urine PGD_2, PGE_2 and PGJ_2 metabolites were increased in asthma in comparison to controls, and 15-dPGJ_2 predicted subsequent asthma exacerbation (PPV=75%, NPV=90%, ROC AUC 0.858, p = 0.005). Sputum eosinophils, spirometry and C-ACT did not predict subsequent exacerbations after correction for multiple comparisons, and sputum phenotypes were unstable. Change in C-ACT score was associated with interim control (p = 0.04).

Conclusions Urinary prostaglandin metabolites are increased in children with asthma in comparison to controls. Urine 15-dPGJ_2 is a biologically plausible, non-invasive marker for inflammometry in childhood asthma, and is superior to assessment of sputum eosinophils, C-ACT, or spirometry.