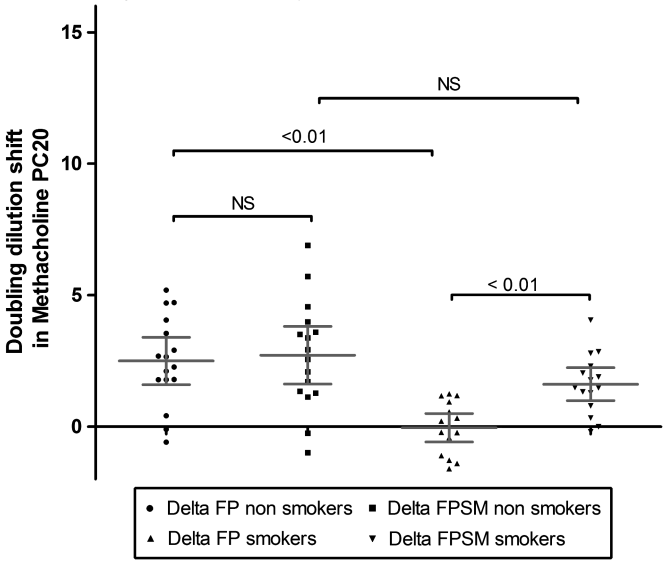
gained proportionally greater benefit from FPSM minus FP compared to smokers: 1.4dd (95% CI 0.01 to 2.8), p=0.047. Similar changes were observed in FEV_1 and IOS, and a similar but non-significant trend was seen with AHR to mannitol.

Conclusion Combination FPSM confers greater improvements in AHR and airway caliber in smoking asthmatics, as compared to double the dose of FP alone. It is likely that in the face of the relative steroid resistance, the smooth muscle stabilisation conferred by SM becomes of greater clinical importance.



P173 MANAGEMENT OF SPUTUM EOSINOPHIL-NEGATIVE PATIENTS IN A SEVERE ASTHMA CLINIC

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Asthma is a heterogeneous disease that requires physicians to further phenotype their patients in order to offer carefully customised treatment. Among recent and rapidly evolving tools at clinicians' disposal are sputum analysis for several markers of inflammation, particularly sputum eosinophil count has become a marker widely used. Sputum differential cell counting was introduced in our severe asthma clinic to help further phenotype our patients with a view to first reducing sputum eosinophils below 3% by augmenting anti-inflammatory therapy, and attempting steroid withdrawal once subjects became sputum eosinophil negative (E−). This report investigates its impact on the management of patients with negative sputum eosinophilia at baseline. To date, 264 patients have been investigated for sputum eosinophils, using induction with nebulised sodium chloride if necessary and suitable. Of these, 71 had 2 or more valid results enabling us to assess how these subjects were managed following their initial negative cell count results. Out of 42 patients initially E−, 36 remained E−. Twenty-seven were offered a trial of reduction in steroid therapy:

2 patients stopped IM triamcinolone (both remained E−);

20 patients had decreased oral prednisolone treatment (15 remained E−)

5 patients decreased inhaled steroid therapy (all remained E−).

Despite negative sputum at baseline, five patients were given a trial of triamcinolone, to confirm their absence of response to steroids, of these 4 remained E−, whilst surprisingly 1 patient became E+.

In those E− at baseline, 64% had a reduction in steroid therapy. Of these more than 80% remained E−, despite reduced therapy, whilst 20% had recurrence of E+. For 83% of those who became E+, there were strong indications that their initial dose of maintenance oral steroids was probably already optimal. It is surprising that five patients were offered a trial of IM triamcinolone despite initial negative sputum eosinophils. However, it has been recently reported that increased steroid therapy in sputum non-eosinophilic patients still had positive impact on reducing markers of inflammation different from sputum eosinophils. It was possible to reduce steroid therapy without losing asthma control for 80% of patients initially E−.

P174 IDENTIFYING NON-ADHERENCE WITH ASTHMA MEDICATION AND THE RELATIONSHIP TO CLINICAL OUTCOMES AMONGST ADULTS WITH DIFFICULT-TO-CONTROL ASTHMA

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Background The failure of patients to adhere to prescribed medication regimens is well documented. The clinical effects of non-adherence can include treatment failure, unnecessary, potentially dangerous and costly intensification of therapy, complications and hospitalisations. The extent of non-adherence and the clinical implications in difficult-to-treat asthma were audited.

Method A total of 161 adult asthma patients attending a difficult asthma clinic during July/August 2009 were included in the audit. GPs retrospective prescription refill data for asthma medicines, patient demographics and clinical outcome data were collated. The medication adherence ratio was calculated as the number of doses refilled/number of doses prescribed ×100 for a mean duration of 12 months. Adherence was defined as adequate if the ratio was ≥80%.

Results Prescription refill data for 132 patients were available (82%), and 115 patients were included in the audit. Poor adherence was identified in 75/115 patients (65.2%) on inhaled corticosteroids (ICS) overall − 64/101 (63.4%) taking combined ICS and long acting β_2 agonist (LABA) inhalers and 11/14 (78.6%) patients taking separate ICS and LABA inhalers (p=0.24). In the 14 patients using separate ICS and LABA, adherence to the LABA (50%) was significantly better than adherence to the ICS (14.3%) (p=0.043). Patients with poor adherence to ICS had a lower post-bronchodilator FEV_1 (75.4 (20.9) vs 84.3 (23.5), p=0.049) and higher sputum eosinophil counts (4.6 (0.66)% vs 2.3 (0.54)%, p=0.05) than those with adequate ICS adherence. There were no significant differences in age, gender, racial origin, smoking history or courses of rescue oral prednisolone between these two groups. Patients with poor ICS adherence were more likely to have been ventilated for asthma (19.2% vs 2.6%, p=0.02). In a multivariate logistic regression model, the adherence ratio was the only independent predictor of previous need for ventilation for acute severe asthma (p=0.008). Thus for each 10% decrease in adherence to ICS, the estimated odds of having been ventilated for asthma increased by 1.85 times.

Conclusion The majority of patients with difficult-to-control asthma are non-adherent with their asthma medication. Patients using separate ICS and LABA inhalers use the LABA more than the ICS. Non-adherence is correlated with several poor clinical outcomes.

P175 CROSS-SECTIONAL AND LONGITUDINAL RELATIONSHIPS OF SELF-MANAGEMENT BEHAVIOURS AND OTHER PSYCHOLOGICAL FACTORS WITH OUTCOMES IN PATIENTS WITH SEVERE ASTHMA

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Background Psychosocial factors are associated with various manifestations of severe asthma. Wider research and theory highlight

complex, bi-directional pathways by which interactions may occur. However, few studies have explored relationships between multiple psychosocial factors and outcomes in severe asthma with these pathways in mind.

Objectives This study investigated combined and independent cross-sectional and longitudinal relationships of self-management behaviours, an index of self-management (ISM), anxiety, depression, perceived control (PC) and socio-demographic/economic characteristics with asthma control, quality of life (QoL) and severe attacks amongst asthma patients on high levels of treatment and/or with a history of admissions.

Methods Cross-sectional data from 132 adults recruited to a previously reported trial of an intervention and accompanying comparative study were subjected to multiple regression analyses. These systematically examined relationships between psychosocial factors and asthma outcomes, and were used to build final hierarchical regression models in which key clinical variables were controlled for. More limited data from a maximum of 112 patients were used to explore longitudinal relationships, primarily with asthma control.

Results Final hierarchical regression models accounted for up to 69% and 73% of the variability in asthma control and QoL respectively ($p<0.001$) and significantly predicted experience of a severe attack ($p<0.001$). Variables showing significant independent relationships to outcomes in these models are highlighted in the Abstract P175 Table 1. Some individual behaviours and the ISM showed independent and differing cross-sectional relationships to each outcome. Other psychological factors were related to subjective outcomes but not severe attacks. Relationships of some psychosocial factors (eg, depression, unemployment) to outcomes were not fully mediated by other variables, including self-management behaviours. In longitudinal analyses, there was some evidence for depression directly contributing to poorer subjective outcomes, whilst relationships of PC and anxiety with outcomes were more variable and inconsistent.

Abstract P175 Table 1 Regression

	Control (11 variables entered)	QoL (12 variables entered)	Attack (6 variables entered)
1. Clinical factors	Severity	(Sev with ISM)	–
2. Self-mgmt behs	Overusing reliever	–	Trigger avoid
3. Psych factors	Depression (PC with ISM)	Anxiety depression PC	N/A
4. Social factors	Employment age	Employment	Age
Var. acc. for (R^2):	69%	73%	app 23–31%
	(63% using ISM)	(72% using ISM)	
	All steps sig (26, 31, 9, 4%)	All steps sig (25, 19, 27, 2%)	All steps sig (~10, 6, 17%)

Conclusions Emotional and cognitive factors appear at least as important as self-management behaviours in relation to subjective outcomes in severe asthma. Along with a growing body of other research, findings suggest a particular need to identify and address depression amongst patients with severe asthma in practice, as in other chronic diseases.

P176 EVALUATING THE ROLE OF TRIAMCINOLONE IN A DIFFICULT ASTHMA SERVICE

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Introduction and Objectives 10% of patients with asthma have disease that is refractory to conventional therapy. Two important factors in this group of patients are non-adherence to prescribed treatment and steroid insensitive airway inflammation. We report on our experience using intramuscular (IM) triamcinolone to evaluate such patients.

Methods We identified 28 patients who were on BTS step 5 treatment for asthma and at risk of fatal or near fatal events, who were given IM triamcinolone in the Glenfield difficult asthma clinic. The primary reason for administration of IM triamcinolone was to evaluate whether these patients had evidence of steroid insensitivity or were potentially non adherent. Adherence was assessed objectively prior to commencing triamcinolone. Juniper asthma control questionnaire (JACQ), fraction of exhaled nitric oxide (FeNO), blood eosinophils, sputum eosinophils, FEV_1 (pre bronchodilator) were measured at baseline and whilst on triamcinolone.

Results Triamcinolone was administered monthly at a dose of 40–80 mg for a median (range) course of 4 (1–19) months. Patient demographics were: 75% (21) female, mean age 40 y, mean BMI 29.1, median dose of ICS (BDP equivalent) 2000 mcg, median dose of maintenance prednisolone 20 mg, 29% (8) had previously been ventilated. Adherence was objectively assessed in 93% (26) with non-adherence demonstrated in 77% (20), either by prescription refill check or drug assays. Significant improvements were seen whilst on triamcinolone in the mean JACQ score from 3.66 to 2.52 ($p=0.0003$), geometric mean FeNO from 52.3 ppb to 17.8 ppb ($p=0.0034$), mean blood eosinophils from 0.59×10^9/l to 0.22×10^9/l ($p=0.0032$), geometric mean sputum eosinophil count from 12.93% to 1.24% ($p<0.0001$) and in pre bronchodilator FEV_1 from 54% to 67% predicted ($p=0.0003$). Of 28 patients receiving IM triamcinolone, 68% (19) showed significant improvement in 2 or more disease markers, 7% (2) showed improvement in 1 disease marker, 18% (5) had an equivocal response and 7% (2) demonstrated no response to parenteral steroid. No significant adverse events were reported.

Conclusions This study shows that IM triamcinolone is a useful tool that may identify non-adherence in difficult-to-control asthmatic patients prescribed maintenance oral corticosteroids. Absolute steroid resistance is uncommon in this group.

P177 FLUTICASONE PROPIONATE/FORMOTEROL FUMARATE COMBINATION THERAPY IS AS EFFECTIVE AS FLUTICASONE PROPIONATE/SALMETEROL XINAFOATE IN THE TREATMENT OF ASTHMA: A RANDOMISED CONTROLLED TRIAL

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Introduction and Objectives A new asthma therapy combining fluticasone propionate and formoterol fumarate (FP/FORM) in a single pressurised metered dose inhaler has been developed. The efficacy and safety of FP/FORM and fluticasone propionate/salmeterol xinafoate (FP/SAL) therapy were compared.

Methods Adults (N=202) with mild to moderate-severe asthma were randomised 1:1 to 12 weeks of treatment with FP/FORM (100/10 μg or 250/10 μg) or FP/SAL (100/50 μg or 250/50 μg), both twice daily, in an open-label, parallel-group, multicentre study. The starting dose was based on the dose of inhaled corticosteroid the patient received before the study. Lung function and safety assessments were made during the 12-week period. The primary endpoint was mean morning pre-dose FEV_1 at Week 12.

Results FP/FORM was as effective as FP/SAL, with a least squares (LS) mean difference in morning pre-dose FEV_1 at Week 12 of −0.061 L between treatments. Non-inferiority of FP/FORM to FP/SAL was demonstrated (the lower limit of the 95% CI exceeded the acceptance limit of −0.2 L). Pre-dose FEV_1 increased in both groups