

prednisolone. Procedures were performed by 2 physicians or by 1 physician and a nurse, using conscious sedation with alfentanil and midazolam. One patient required deeper sedation [remifentanyl and propofol] due to a complicated medical history. Bronchial thermoplasty was administered in three sessions, treating the right lower lobe, the left lower lobe and both upper lobes respectively. Follow up is at 3 monthly intervals for both safety and efficacy outcomes.

Results Between 2nd June 2011 and 30th April 2012, ten patients underwent bronchial thermoplasty in Glasgow [7 males, 3 females] (Table 1). Six patients were at Step 5 and four at Step 4 of the British Guideline on the Management of Asthma scale. 4/10 were taking oral prednisolone daily and 2/10 were receiving omalizumab treatment [for 4th year and 3rd year respectively]. Treatment sessions were largely uneventful and adverse effects were similar to those reported in clinical trials. To date, there has been a reduction in some asthma medications: two patients receiving omalizumab have successfully discontinued treatment; those taking oral steroids are being weaned off prednisolone.

Conclusion Bronchial thermoplasty can be safely delivered in a clinical setting to patients with severe asthma.

References

1. Thomson NC, Bicknell S, Chaudhuri R Bronchial thermoplasty for severe asthma. *Curr Opin Allergy Clin Immunol* 2012; 12:241–248.

Abstract P5 Table 1 Baseline demography of 10 patients with severe asthma treated with bronchial thermoplasty

	Mean [SD]	Min–Max
Age (years)	48 [10]	35–65
Beclometasone equivalent ICS dose (µg)	2580 [1425]	1000–6000
ACT Score	11.3 [4.27]	6–20
AQLQ Score	3.94 [0.83]	2.7–5.1
HADS Total	11.6 [8.7]	2–27
FEV ₁ (L)	2.55 [0.6]	1.6–3.46
FEV ₁ (% predicted)	71.4 [16.8]	43–96
Exhaled nitric oxide (ppb)	43 [40]	2.7–126
Exacerbations in past 12 months	2.9 [3.1]	0–8
Hospital admissions/A&E in past 12 months	1 [1.9]	0–5

Abbreviations ACT=asthma control test; AQLQ=asthma quality of life questionnaire; HADS=hospital anxiety and depression scale, FEV₁=forced expired volume in one second.

P6 FLUTICASONE PROPIONATE/FORMOTEROL FUMARATE COMBINATION THERAPY HAS AN EFFICACY PROFILE SIMILAR TO THAT OF ITS INDIVIDUAL COMPONENTS ADMINISTERED CONCURRENTLY

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Background A new asthma therapy containing a combination of the inhaled steroid fluticasone propionate (FLUT) and the long-acting β₂ agonist (LABA) formoterol fumarate (FORM) in a metered-dose inhaler has been developed (FLUT/FORM; *flutiform*®). In a double-blind, double-dummy, randomised, multicentre, four arm parallel group study, the efficacy and safety of FLUT/FORM vs. FLUT and FORM administered concurrently (FLUT+FORM) was assessed. Here we present efficacy results of a post-hoc subgroup analysis comparing FLUT/FORM 500/20 µg vs. FLUT+FORM 500 µg + 24 µg (both twice-daily) by baseline asthma severity.

Methods In total, 620 patients were randomised 1:1:1:1 to receive FLUT/FORM 500/20 µg, FLUT/FORM 100/10 µg, FLUT+FORM

500 µg + 24 µg or FLUT 500 µg. Randomisation was stratified by percentage predicted FEV₁ at baseline [≥40– ≤60% ('severe asthma'; 52% of patients) vs. >60% – ≤80% ('moderate asthma'; 48% of patients)], allowing a post-hoc dichotomised analysis by baseline FEV₁ severity of spirometric and symptom-based endpoints.

Results Similar improvements in lung function (change in pre-dose FEV₁ and change in 2-hour post-dose FEV₁) were seen in the FLUT/FORM 500/20 µg treatment group and the FLUT+FORM 500 µg + 24 µg treatment group overall [treatment difference 0.079 (95% CI: -0.032, 0.190) *P*=0.164 and treatment difference 0.040 (95% CI -0.069, 0.149) *P*=0.471, respectively]. Both severe and moderate asthmatic subgroups demonstrated mean changes from baseline approximating or exceeding a minimally important improvement (200 mL)¹ with similar efficacy in the FLUT/FORM 500/20 µg and the FLUT+FORM 500 µg + 24 µg moderate and severe subgroups (Table 1).

There were no statistically significant or clinically relevant differences overall or in either of the subgroups between FLUT/FORM 500/20 µg and FLUT+FORM 500 µg + 24 µg for any symptom-based endpoints. These included asthma symptom scores, sleep disturbance scores, rescue medication use and asthma control days.

Conclusion FLUT/FORM and FLUT+FORM demonstrated similar improvements in lung function (pre-dose and 2-hour post dose FEV₁) and symptom-based endpoints in the overall population, and in both subgroups.

Abstract P6 Table 1 Summary of LS mean changes from baseline for spirometric endpoints, overall and stratified by FEV₁ % predicted – ITT population

Endpoint	FLUT/FORM 500/20 µg n=154	FLUT + FORM 500 µg + 24 µg n=156
Change in pre-dose FEV ₁ from Day 1 to Day 56		
All patients	0.346	0.267
Treatment difference (95% CI)		0.079 (-0.032, 0.190)
<i>P</i> -value		<i>P</i> = 0.164
FEV ₁ ≤60% subgroup	0.414	0.353
Treatment difference (95% CI)		0.061 (-0.108, 0.231)
<i>P</i> -value		<i>P</i> = 0.477
FEV ₁ >60% subgroup	0.260	0.173
Treatment difference (95% CI)		0.087 (-0.053, 0.227)
<i>P</i> -value		<i>P</i> = 0.222
Change in pre-dose FEV ₁ from pre-dose Day 1 to 2-hours post-dose Day 56		
All patients	0.517	0.477
Treatment difference (95% CI)		0.040 (-0.069, 0.149)
<i>P</i> -value		<i>P</i> = 0.471
FEV ₁ ≤60% subgroup	0.569	0.577
Treatment difference (95% CI)		0.007 (-0.172, 0.157)
<i>P</i> -value		<i>P</i> = 0.930
FEV ₁ >60% subgroup	0.449	0.367
Treatment difference (95% CI)		0.082 (-0.056, 0.221)
<i>P</i> -value		<i>P</i> = 0.244

P7 ASSESSING THE INTUITIVE EASE OF USE OF A NOVEL DRY POWDER INHALER, THE FORSPIRO™ DEVICE, FOR ASTHMA AND COPD

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Poor inhaler technique has been recognised as a significant contributor to poor control. (1) A number of authors have attempted

to identify desirable attributes of an inhaler.(2,3) "Ease of use" is an important characteristic but is often determined after instructed training. Whilst the importance of initial and repeat correct inhaler technique training cannot be overlooked, a dry powder inhaler (DPI) device that is intuitively easy to use may be more beneficial for those patients with poor technique recall or with barriers to access adequate training. An intuitively easy to use inhaler such as the Sandoz Forspiro™ device may facilitate correct patient handling. A 28 day study to assess the intuitive ease of use of the Forspiro device was conducted in 24 Accuhaler® users (≥ 1 year use), aged 20–86 years (mean age = 53.8). Participants were separated into 2 groups of 12 and received either limited written instructions about the use of the device (Uninstructed) or were given fully illustrated instructions for use (Instructed). See table 1. The correlation of the ease of use assessment by Uninstructed and Instructed subjects has shown that the new Forspiro DPI is intuitive to use, even in patients that had received minimal instructions for use. The introduction of innovative generic versions of inhaled medications enables the much needed economic rationalisation of drug use in these times of austerity within the NHS. Benefitting from advanced design technology, drawn from years of patient feedback, generic versions of inhaled medications may be more readily adopted by patients and HCPs if the device is intuitive to use. The importance of initial and repeat correct inhaler technique training cannot be overlooked, however intuitively easy to use inhalers, such as the Forspiro device, may facilitate correct patient handling. Refs: 1. Giraud 2002; 2. Virchow 2008; 3. Chrystyn 2007

Abstract P7 Table 1 Subject ratings of ease of use of the novel Forspiro DPI device

	Instructed (n=12)		Uninstructed (n=12)	
	Very easy	Fairly easy	Very easy	Fairly easy
Overall ease of use	8	4	3*	8
Ease of determining the number of doses left	10	2	7*	4
Ease of preparing a dose	10	2	8	4
Ease of removing used blisters	8	4	8	4

*One subject in the uninstructed group rated this aspect "Fairly difficult".

P8 VITAMIN D DEFICIENCY IN THE DIFFICULT ASTHMA POPULATION; FINDINGS FROM A DIFFICULT ASTHMA CLINIC

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Introduction Recent interest has focussed on potential regulatory roles for vitamin D in the development and course of asthma.

Aim We assessed the prevalence and characteristics of patients with vitamin D deficiency, during a calendar year, among our Regional Difficult Asthma Clinic population.

Methods Retrospective study was undertaken to assess vitamin D deficiency prevalence plus characterisation of "deficient" compared to "normal" vitamin D level patients. Characterisation included demographic factors, associated comorbidities, asthma severity (BTS steps), and spirometry during that 12 month period. Comorbidities recorded included BodyMass Index (BMI), smoking status, atopic status, rhinitis, food allergy, salicylate sensitivity, sulphite sensitivity, Gastro-oesophageal Reflux disease (GORD), dysfunctional breathing, and psychological comorbidity.

Results Serum vitamin D3 assessment was available for 85.4% (158/185) patients during the previous 12 months. First measured vitamin D3 levels were used for primary analysis showing a mean clinic vitamin D3 level of 45.1nmol/L. Normal vitamin D3 levels (>72nmol/L) occurred in 18.9%, 14.6% had insufficient levels (52–72nmol/L) and 65.5% had deficient levels (<52nmol/L). Severe deficiency (<20nmol/L) occurred in 14.6%. Vitamin D deficiency showed highest prevalence during Winter, Autumn and Spring(83–79%) and lowest level in Summer (53.3%). Two thirds of patients received a course of vitamin D replacement therapy during the year.

Vitamin D deficient showed no difference compared to normal vitamin D3 status patients in atopic status, spirometry, inhaled medication usage, maintenance oral steroid use, Omalizumab use and asthma hospitalisations. No significant difference was observed between the two groups in respect to comorbidities like GORD, rhinitis, COPD, bronchiectasis, food allergy and dysfunctional breathing. However, vitamin D deficient subjects had significantly higher BMI (31.6 v 26.4 kg/m²; p=0.007), obesity (BMI>30) (55.3% v 13%; p<0.001) and psychological comorbidity (26.7% v 3.6%; p =0.009).

Conclusion Vitamin D deficiency is highly prevalent in the Difficult Asthma group. The clinical relevance of this finding remains unclear. While vitamin D deficient patients did not show greater asthma treatment needs or healthcare use that might have reflected influence of receiving high dose vitamin D replacement. Patients with vitamin D deficiency showed significantly greater obesity and psychological comorbidity. The association of vitamin D and Difficult Asthma merits further attention.

P9 ADRENAL SUPPRESSION IN DIFFICULT ASTHMA: A NEGLECTED CAUSE FOR CONCERN

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Introduction Inhaled corticosteroids (ICS) are the mainstay of treatment in asthma. Whilst they are felt to be safe in low doses, a number of case studies have demonstrated adrenal suppression in higher doses, particularly in paediatric patients. The relative frequency of this is largely unknown, but we believe it may be significantly under-recognised in patients with difficult to treat asthma. As part of our difficult asthma protocol we measure random cortisol levels and proceeded to further investigations if this was abnormal or the patient presented with symptoms of adrenal insufficiency.

Methods Patients were assessed through the Difficult Asthma Service in Leeds which is a tertiary referral centre for West Yorkshire. Patients who had non-specific symptoms out of keeping with asthma, either had a random serum cortisol taken or had a short synacthen test. Patients were classified as: adrenal insufficient with a cortisol less than 50nmol/L or a positive short synacthen test, and adrenal sufficient with a random cortisol greater than 120nmol/L or a negative short synacthen test. A further group was defined as sub-optimal if their random cortisol was between 50–120nmol/L Data were also collected on ICS dose and type, and atopic status.

Results Ninety-two random cortisol samples have been taken to date. Of these, 8 patients who were not on oral corticosteroids were found to have adrenal insufficiency (8.7%). Seven patients had a random cortisol less than 50nmol/L and one had a positive short synacthen test. Of the patients with adrenal insufficiency six patients were on a combination inhaler including fluticasone, and all received a daily BDP dose over 1000mcg. None of the patients with adrenal insufficiency demonstrated evidence of atopy, except one patient with co-existent ABPA receiving itraconazole therapy.

Conclusions We have identified a significant number of patients with evidence of adrenal insufficiency, with the majority identified by a random cortisol. This is likely to be under-estimated, as the 92