

samples include patients on maintenance oral corticosteroids. In patients with difficult asthma, multiple or atypical symptoms, there should be a low threshold to investigate for adrenal insufficiency particularly those receiving high dose ICS.

P10 **RANDOMISED PLACEBO CONTROLLED TRIAL TO EVALUATE CHRONIC DOSING EFFECTS OF PROPRANOLOL IN STEROID TREATED PERSISTENT ASTHMATICS**

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Introduction and Objectives Beta-blockers are associated with acute bronchospasm in asthmatics. However preliminary unblinded studies have shown potential therapeutic benefits with chronic beta-blockade on airway hyper-responsiveness (AHR) in steroid naïve asthmatics. We examined the effects on AHR of propranolol versus placebo in steroid treated persistent asthmatics.

Methods A double-blind randomised placebo controlled crossover trial of propranolol in mild-to-moderate asthmatics receiving inhaled corticosteroids (ICS) was performed (NCT01074853). Participants underwent a six to eight week dose titration of propranolol or placebo as tolerated to a maximum of 80mg per day. Tiotropium was given concurrently for the first four to six weeks of each treatment period. Primary outcome was methacholine challenge (without tiotropium). Secondary outcomes included histamine challenge (with and without tiotropium), pulmonary function, heart rate, blood pressure, mini-asthma quality of life questionnaire (mini-AQLQ) and asthma control questionnaire (ACQ).

Results 18 patients completed: mean (SEM); age 36 (4), FEV₁% 93 (2), ICS ug/day 440 (66). No significant difference was observed in methacholine or histamine challenge following exposure to propranolol versus placebo. For methacholine challenge (without tiotropium) the doubling dilution difference (DDD) was 0.04 (95%CI -0.56 - 0.63), p=0.89. For histamine challenge without tiotropium the DDD was 0.42 (95%CI -0.09 - 0.93), p=0.10; and with tiotropium was DDD 0.26 (95%CI -0.36 - 0.87), p=0.39. Salbutamol induced chronotropic response was significantly blunted following propranolol versus placebo: mean difference 25bpm (95%CI 14 - 37), p<0.001. No difference was found for ACQ, mean difference 0.18 (95%CI -0.23 - 0.58), p= 0.79 or mini-AQLQ, mean difference 0.14 (95%CI -0.19 - 0.46), p=0.84.

Conclusions This is the first placebo controlled study to assess the effects of chronic non selective beta-blockade in steroid treated persistent asthmatics, showing no significant effect of propranolol compared to placebo on AHR to either methacholine or histamine and no change in ACQ or AQLQ.

P11 **REDUCTION IN HEALTHCARE RESOURCE UTILISATION WITH 2 YEARS TREATMENT WITH OMALIZUMAB IN SEVERE ATOPIC ASTHMATICS: A SINGLE CENTRE OBSERVATION**

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Background While asthma is a chronic inflammatory disorder that is managed with inhaled controller and reliever drugs, there remains a large unmet need at the severe end of the disease spectrum.

Omalizumab is licenced as add-on therapy for patients with uncontrolled severe persistent atopic (IgE-mediated) asthma.

Aim Retrospective review of healthcare utilisation and clinical outcomes of the efficacy of Omalizumab administered as per NICE approval on a 2- or 4-weekly basis in adults with severe allergic asthma in our tertiary centre in Hull.

Methods We compared data in our cohort of patients on Omalizumab therapy at 2-years pre-Omalizumab, 16-weeks, 1- and 2-years post-Omalizumab. Our primary outcome was healthcare utilisation (asthma-related hospital admissions, bed and critical care bed days, oral corticosteroid courses (OCS) and reduction in overall OCS dose). Secondary parameters assessed included subjective (asthma control test (ACT), and quality-of-life (AQLQ) and its domain scores) and objective parameters (spirometry and morning peak flows) outcomes.

Results Our 9 patients (2 M, 7 F) on Omalizumab therapy had an average (\pm SD) age of 52 (\pm 11.9). Overall in-hospital admissions reduced from 28 days in the 2 years pre-Omalizumab to 0, 4 and 3 days at 16-weeks, 1- and 2-years respectively. Correspondingly, medical bed days diminished from 163 pre-treatment to 0, 17 and 10 at 16-weeks, 1- and 2-years respectively. Astonishingly, critical care bed day's utility declined from 36 pre-Omalizumab, to 0 at all post-Omalizumab time points. Furthermore, total OCS courses usage reduced noticeably from 39 pre-treatment to 5, 9 and 10 at 16-weeks, 1- and 2-years respectively. There were marked improvements in AQLQ and its domains, and ACT scores, however changes in objective measures assessed were minimal (see Table 1).

Conclusion Results from our single centre, in a small cohort of severe atopic asthmatics treated with Omalizumab, have shown striking reductions in healthcare resource utilisation, OCS use and subjective assessments compared to the two years prior to its initiation. This real-life effectiveness of Omalizumab supports its utility in this group of severely allergic asthmatics refractory to standard treatment.

P12 **FLUTICASONE PROPIONATE/FORMOTEROL FUMARATE COMBINATION THERAPY: TREATMENT EFFECTS IN PATIENTS BY BASELINE ASTHMA SEVERITY ACROSS THE DOSE RANGE**

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Background A new asthma therapy containing a combination of the inhaled steroid fluticasone propionate (FLUT) and the long-acting β_2 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 analysis that compared FLUT/FORM 500/20 μ g with FLUT/FORM 100/10 μ g (both twice-daily) by baseline asthma severity.

Methods In total, 620 patients were randomised 1:1:1:1 to receive FLUT/FORM 500/20 μ g, FLUT/FORM 100/10 μ g, FLUT+FORM 500 μ g + 24 μ g or FLUT 500 μ g. Randomisation was stratified by percentage predicted FEV₁ at baseline [\geq 40 - \leq 60% ('severe asthma'; 52% of patients) vs. $>$ 60% - \leq 80% ('moderate asthma'; 48% of patients)], allowing a post-hoc dichotomised analysis by baseline FEV₁ severity of spirometric and symptom-based endpoints.

Results There was no dose-response relationship between FLUT/FORM 500/20 μ g and FLUT/FORM 100/10 μ g for the spirometric variables overall or in either subgroup.

Treatment effect differences between FLUT/FORM 500/20 μ g and 100/10 μ g, in favour of the high dose, were however evident for almost all symptom-based endpoints and were more pronounced in the severe asthma group. These included changes in: mean symptom scores, percentage symptom-free days, mean sleep disturbance scores, awakening free nights, percentage rescue medication-free days, percentage asthma control days, AQLQ score and the incidence of any asthma exacerbations. The differences between FLUT/

Abstract P11 Table 1

Parameter assessed	Baseline (pre-omalizumab)*	16-weeks*	1-year*	2-year*
Maintenance Steroid Dosage	7.3 (0, 11)	4 (0, 6.25)	5.1 (0, 10)	5.1 (0, 10)
FEV1	1.60 (1.1, 2.1)	1.51 (1.35, 2.6)	2.74 (1.71, 2.87)	1.35 (0.81, 2.29)
FEV1%	64.5 (39.0, 78.0)	58.0 (52.0, 81.0)	84.0 (56.0, 97.0)	52.0 (35.0, 75.0)
FVC	2.30 (2.12, 2.94)	2.74 (2.34, 3.8)	3.83 (2.95, 4.42)	2.74 (2.36, 3.43)
FVC%	75.0 (70.0, 88.0)	84.0 (63.0, 118)	113.0 (92.0, 123)	80.0 (74.0, 97.0)
FEV1/FVC %	53.0 (51.0, 75.0)	66.0 (58.0, 72.0)	60.0 (47.0, 66.0)	51.0 (43.0, 69.0)
Morning PEF	250 (176, 300)	300 (230, 350)	260 (250, 350)	220 (185, 320)
ACT	7 (7, 7)	13 (11, 18)	11 (9, 13)	13 (11, 13)
Overall AQLQ	2.26 (2.26, 3.2)	4.06 (3.8, 5.7)	4.43 (4.35, 4.52)	4.00 (3.4, 4.6)
AQLQ Symptoms domain	2.4 (2.3, 2.6)	4.4 (4.03, 5.5)	3.6 (3.6, 3.6)	4.9 (4.45, 5.1)
AQLQ Activities domain	3.38 (2.69, 4.75)	5.0 (4.38, 6)	4.63 (4.31, 4.94)	4.38 (3.5, 4.94)
AQLQ Emotions domain	2.50 (2.07, 3.75)	4.0 (3.33, 5.0)	6.33 (5.6, 6.67)	4.1 (3.45, 5.2)
AQLQ Environment domain	2.47 (1.99, 2.95)	3.0 (2.5, 4.5)	3.63 (3.15, 4.12)	2.8 (2.45, 3.5)

FORM 500/20 µg and 100/10 µg in the severe asthma group were significant at the 5% level for sleep disturbance scores [treatment difference -0.138 (95% CI: -0.265, -0.012) $P=0.032$], percentage awakening-free nights [treatment difference 11.754 (95% CI: 2.234, 21.274) $P=0.016$] and mean AQLQ score [treatment difference 0.302 (95% CI: 0.013, 0.591) $P=0.041$].

Conclusion High dose FLUT/FORM (500/20 µg) was consistently associated with greater symptomatic treatment benefit than low dose (100/10 µg) treatment in patients with severe asthma. These data provide a rationale for dose escalation with FLUT/FORM, which appears most likely to confer additional treatment benefit in patients with severe asthma.

Clinical observations in acute and chronic lung infection

P13 MISMATCH BETWEEN CLINICAL AND RADIOLOGICAL DIAGNOSIS OF PNEUMONIA

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Introduction National guidelines on management of pneumonia stipulate the need for radiological evidence of consolidation to confirm the diagnosis. An incorrect diagnosis may lead to sub-optimal management, inappropriate antibiotic use and prolonged hospital stay. We sought to determine the relationship between clinical diagnosis of pneumonia and radiological evidence on chest x-ray.

Methods We performed a retrospective case-note study of admissions with a diagnosis of pneumonia in a large district general hospital during a three month period. Cases with pneumonia were identified using the ICD-10 coding system; those with co-existing diagnoses of malignancy or bronchiectasis were excluded. Clinician diagnoses of pneumonia were established by examination of clinical discharge summaries. All chest radiographs performed throughout the admission episode had been evaluated by a radiologist. Serum white cell count (WCC) and C-reactive protein (CRP) at admission were also examined.

Results 132 coded records of pneumonia were identified, of which a clinician diagnosis of pneumonia was recorded on 91. Median (interquartile range) age was 75 (61–89) years, 57% female, and median length of stay was 9 (3–23) days. CAP accounted for 65%, hospital acquired pneumonia 15%, aspiration pneumonia 1% and in 19% the origin was unclear. In 37% of all cases, there was no

evidence of consolidation on any of the chest radiographs performed during inpatient stay. Subjects without radiological consolidation had similar length of stay to those with consolidation. There was no significant difference in age ($p=0.34$) or gender ($p=0.28$) between groups. WCC and CRP were significantly lower in those without consolidation. Analysis of cases where pneumonia was highlighted as the primary reason for admission ($n=47$) was similar to the overall cohort: 26% had no radiological evidence of consolidation.

Conclusion A significant proportion of clinical diagnoses of pneumonia are made despite no radiological evidence of consolidation. Studies are required to investigate if this could be due to a lack of awareness of diagnostic criteria, mismatch in chest x-ray interpretation or other factors in the clinical presentation.

Abstract P13 Table 1 Length of stay and inflammatory indices in patients with and without radiological evidence of pneumonia

	Consolidation on x-ray (n=57)	No consolidation on x-ray (n=34)	P Value
Length of stay	9 (4–19)	11 (2–31)	0.87
Median WCC	11.8 (9.0–15.7)	8.5 (6.3–12.6)	0.002
CRP	123 (55–209)	34 (8–66)	<0.001

Data presented as median (IQR). WCC: white cell count; CRP: C-reactive protein

P14 PNEUMONIA: 30 MONTHS OF ADVANCING QUALITY IN NORTH WEST ENGLAND

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As part of an initiative to improve the quality of care within the North West Strategic Health Authority, five 'quality markers' (QMs) were measured in all adult admissions with pneumonia in all 23 Acute Trusts in the North West Region. Results for discharges for 30 months from October 2008 are presented. Data reporting was changed to match the financial year in 2009 so cohorts from October 2008–September 2009, October 2009–March 2010 and April 2010–March 2011 are presented. Only adults who fulfilled a prescribed definition of 'pneumonia' were included.

QMs were taken from a USA initiative and adapted for UK use. Patient identification was based on clinical coding. Data was recorded in each individual Trust and centrally collated.

Data on 31,972 pneumonia episodes were included (11,127, 6,683, 14,162 in each time period respectively). Mean results of %