

# P175 SINGLE CENTRE EXPERIENCE OF THE REAL-LIFE IMPACT OF PIRFENIDONE ON LUNG FUNCTION IN PATIENTS WITH IDIOPATHIC PULMONARY FIBROSIS

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**Introduction** Idiopathic pulmonary fibrosis (IPF) is a progressively destructive lung disease that culminates in respiratory failure and death. Trials have demonstrated that treatment of IPF patients with Pirfenidone reduces %FVC decline, improves progression-free survival and significantly reduces the risk of all-cause mortality at 1 year. Our anecdotal experience is that a small proportion of patients show improvement of %FVC with treatment.

**Objectives** To assess the proportion of patients in an ILD specialist centre that improve, stabilise or decline in their %FVCs on Pirfenidone treatment.

**Methods** In this retrospective study patients with IPF diagnosed according to the ATS/ERS guidelines at the ILD MDT, who were commenced and continued on Pirfenidone for >6 months were included. Data was derived from the clinical records of the Oxford IPF clinic.

**Results** 100 patient records were analysed and 31 were excluded (n = 15 <6 months' therapy, n = 5 inadequate data, n = 2 death <1 month, n = 9 other). 58 (84.1%) male, 11 (15.9%) female; 38 (55.1%) had Definite IPF, 31 (44.9%) Probable IPF.

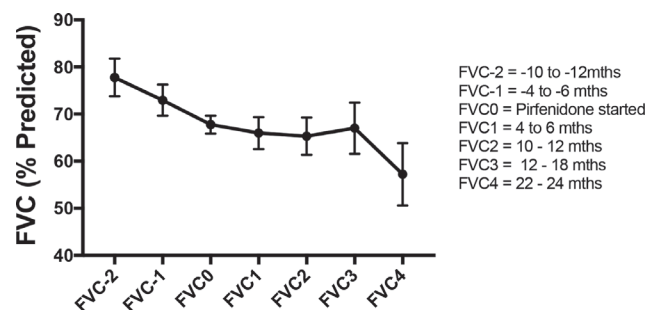
Six months after commencing Pirfenidone (n = 69 patients), 5 (7.25%) experienced significant (>10%) and 9 (13.04%) experienced marginal (5–10%) improvement in %FVC, 33 (47.83%) showed stability (–5% to 5% change %FVC), 10 (14.49%) showed marginal decline (–5% to –10%) and 12 (17.39%) showed significant (>10%) decline in %FVC.

After one year of Pirfenidone (n = 44 patients), 3 (6.8%) showed significant and 5 (11.4%) showed marginal improvement, 18 (40.9%) showed stability, 11 (25%) showed mild and 7 (15.9%) showed significant decline of %FVC.

After 2 years of treatment (n = 15 patients), 1 (6.7%) showed significant and 3 (20%) showed mild improvement, 4 (26.7%) showed stability, 3 (20%) showed mild and 4 (26.7%) showed significant decline of the %FVC.

Among 8 patients who had improvement in %FVC at one year, 6 were males, 6 had definite IPF, median age 77 years (68–84) and the median FVC was 73.5% predicted (66–79).

**Conclusions** Real-life use of Pirfenidone shows clear slowing of decline in the %FVC, whereas a clinically significant subset show improvement in FVC. Potentially the beneficial effect is lost after 22–24 months, although small numbers limit this analysis.



Abstract P175 Figure 1 Pre and Post- pirfenidone treatment

## Paediatric Respiratory Disease

### P176 DIAGNOSING ASTHMA IN CHILDREN USING SPIROMETRY: EVIDENCE FROM A BIRTH COHORT STUDY

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**Background** NICE draft guidance for the diagnosis of childhood asthma proposes algorithms based on four tests of lung function (FEV1/FVC ratio, bronchodilator reversibility [BDR], FeNO, PEFR variability); a minimum of two tests must be positive to make a diagnosis. For FEV1/FVC ratio, the proposed cut-off for a positive test is <70%, or the lower limit of normal (LLN), which is neither defined nor widely available. In this algorithm, spirometry is the first-line investigation, and children with FEV1/FVC > 70% are not offered BDR. However, the diagnostic test accuracy for FEV1/FVC and BDR is unknown. Within the setting of a population-based birth cohort we investigated the value of FEV1/FVC and BDR in diagnosing asthma.

**Methods** We assessed study participants at clinical follow-up at age 16 years using validated questionnaires and lung function measurement. Spirometry was measured according to ATS/ERS guidelines. Using the Asthma UK reference equations, we calculated LLN for FEV1/FVC. BDR was considered positive if FEV1 increased by >12% following administration of 400 mg of salbutamol. Current asthma was defined as all three of: (1) doctor-diagnosed asthma ever, (2) wheezing in the previous 12 months and (3) current use of asthma treatment. We assigned children negative to all three features as a non-asthmatic control group.

**Results** Spirometry was available for 630 children (325 boys, age range 13.1–16.9 years), of whom 74 (11.7%) had current asthma and 403 were assigned as non-asthmatic controls. FEV1/FVC was significantly lower among asthmatics (84.1% vs. 89.2%,  $p < 0.001$ , Figure 1). Ten children (1.6%) had FEV1/FVC <70% (two in asthma group). Discriminative ability of FEV1/FVC < 70% was poor (Receiver operating characteristic curve, AUC = 0.70; sensitivity = 2.7% [2/74], specificity = 98.8% [398/403]). For the calculated FEV1/FVC LLN (74.8% for boys, 78.2% for girls), 28 children (4.4%) had FEV1/FVC <LLN (11 in asthma group). Discriminative ability of FEV1/FVC <LLN was poor (sensitivity 14.9% [11/74]; specificity 97.0% [391/403]). BDR was positive in 54 children (8.7%), of whom 12 had asthma. Discriminative ability of BDR was poor (AUC = 0.64, sensitivity = 16.2% [12/74], specificity = 93.5% [373/399]). Combining these two tests did not result in a better diagnostic accuracy (sensitivity = 2.7%, specificity = 99.0%).

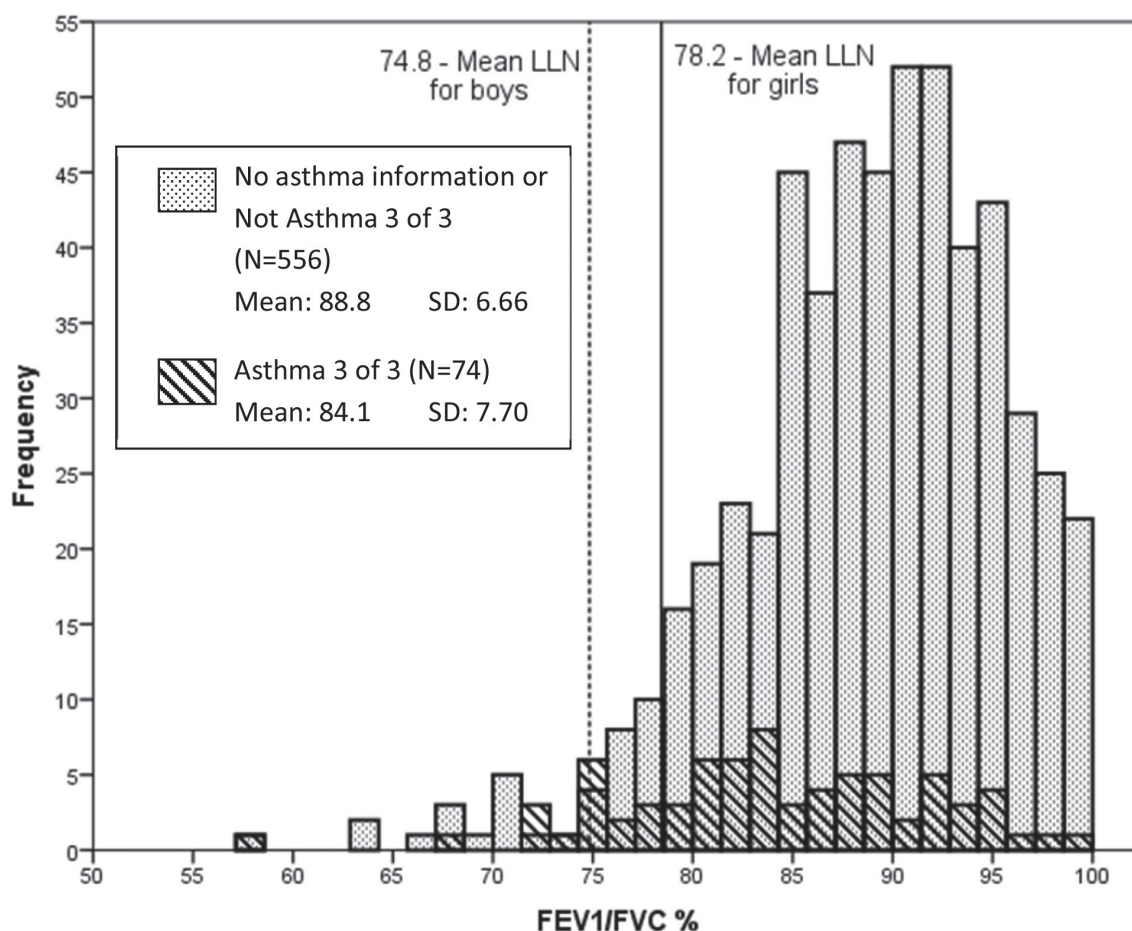
**Conclusions** FEV1/FVC < 70% or <LLN, and BDR > 12% have a poor diagnostic accuracy as tests for childhood asthma.

### P177 HIGH PREVALENCE OF UNRECOGNISED ASTHMA IN CHILDREN WITH SICKLE CELL DISEASE

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**Background** Sickle Cell Disease (SCD) affects about 1 in 1,900 children born in the UK. Respiratory morbidity affects children as well as adults with SCD and the burden may have been



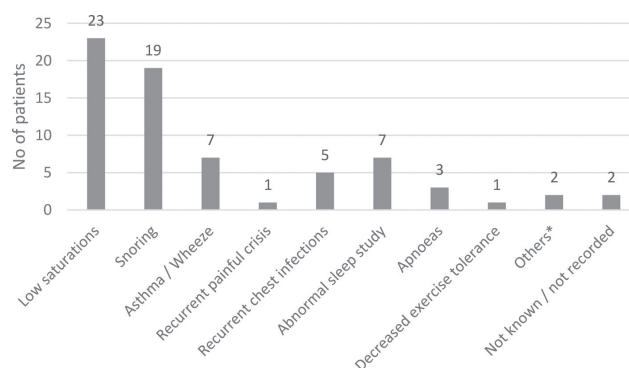
Abstract P176 Figure 1

underestimated in the past. The published literature suggests that asthma, airway hyper-reactivity and sleep disordered breathing (SDB) are common in children with SCD. Furthermore asthma and SDB have been reported to be associated with acute chest syndrome (ACS) and vaso-occlusive crises (VOC). Children with SCD are increasingly referred to our respiratory clinic in a tertiary paediatric centre in the UK. We did an analysis of a sample of these children to gain some preliminary insights into the problem.

**Method** A retrospective observational study was carried out using data from children with SCD who had been referred to our tertiary paediatric respiratory clinic between 1<sup>st</sup> September 2009 and 31<sup>st</sup> August 2014. Data was collected from electronic patient records and electronic investigation results.

**Results** 54 patient records were evaluated. The mean age of the children was 11 years and 54% were male. The most common reason for referral was low oxygen saturation on pulse oximetry (23/54).

Surprisingly, asthma and wheeze were uncommon reasons for referrals comprising only 7/54 (Figure 1). However, of all the patients 48% were discovered to have asthma and 52% had SDB. In those patients who underwent lung function testing an abnormal result was reported in 60% (25/42). In addition 71% of children who had a sleep study had an abnormal result (35/49). No association between ACS or VOC events in those patients with asthma or SDB was noted but this could have been due to the small numbers.



Abstract P177 Figure 1 Reason for referral to respiratory clinic

**Conclusion** In this sample of children with SCD referred mainly because of low oxygen saturation, the high proportion with an abnormal sleep study and SDB might have been expected. However, the relative paucity of reported wheeze and exercise intolerance despite large numbers with abnormal lung physiology suggested that conditions such as asthma may be unrecognised in these patients.

**P178 CHILDHOOD ASTHMA MANAGEMENT IN PRIMARY CARE: IMPLEMENTATION OF NITRIC OXIDE AND SPIROMETRY (CHAMPIONS) STUDY. PRELIMINARY FINDINGS**

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**Introduction** Despite the common nature of asthma there is no gold standard test for diagnosis. Both under- and over-diagnosis of childhood asthma in primary care have been reported but there is no UK data.<sup>1,2</sup> Diagnostic algorithms including objective tests have been proposed but not implemented following a recent NICE consultation. Concerns regarding efficacy and additional resources needed in primary care to provide these tests have delayed implementation.

**Aims**

- Evaluate practice based barriers to spirometry and exhaled nitric oxide (eNO) testing in children aged 5–16 years
- Examine how training impacts on the utilisation of objective tests on asthma diagnosis

**Methods** Currently 3 GP surgeries of different sizes and demographics participate in this 2-year project.

Initial face-to-face (F2F) meetings and questionnaires are conducted at each practice to identify barriers to implementation. Paediatric spirometry and eNO training is provided to practice staff (F2F theory session plus practical supervision).

All children on the practice asthma register AND those who received asthma medications within the last 12 months (but not on register) are invited for review.

Data collection (medications, exacerbations, asthma diagnosis etc.) and quality of life questionnaires are conducted at baseline and then again at 6 months by post and repeat review of electronic records

**Results** Recruitment commenced on 01/06/2016.

To date, nursing staff at two practices have received training and 10 children (5–15 years) have been recruited (11 eligible) in the course of 3 asthma review clinics. Spirometry and eNO were successful in 8 of these children.

Practice staff have expressed concerns regarding funding, additional clinic time and staff training as the main barriers against implementation.

**Conclusions** Our early data suggests that providing spirometry and eNO for children in general practice is achievable with our training package. Both the training package and clinic structure are being refined to improve time and cost-efficiency.

This study (which when complete will contain a health economic analysis) will provide important evidence to inform NHS decision makers and primary care stakeholders on the usefulness of objective testing in children diagnosed and/or under investigation for asthma in general practice.

**REFERENCES**

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**P179 ANTECEDENTS OF ASTHMA ADMISSIONS IN CHILDREN: A WHOLE POPULATION LINKAGE STUDY**

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**Introduction** Asthma is a complex condition where early respiratory infections are implicated in causation. However, the literature is not always supportive of the paradigm that early respiratory infection increases the risk for later asthma. Here, we test the hypothesis that hospital admission with bronchiolitis or lower respiratory tract infection (LRTI) before age two is associated with increased risk for an asthma admission after two years of age.

**Method** Details of all paediatric admissions to Scottish hospitals 2000–2013 were obtained. Admissions with bronchiolitis, LRTI and asthma were identified. Each individual had a unique identifier which allowed linkage of admissions.

**Results** There were 329211 admissions, including 28856 with bronchiolitis, 8558 with LRTI and 14734 with asthma. 2.7% of those with a bronchiolitis admission and 3.8% with a LRTI admission had a later asthma admission (see Table 1). Compared to zero previous bronchiolitis admissions, one admission was associated with a reduced risk for asthma admission (odds ratio [OR] 0.71 [95% CI: 0.65, 0.77] but this risk increased after two bronchiolitis admissions (1.19 [95% CI: 0.99, 1.41]) and after ≥3 admissions (OR 1.52 [95% CI: 1.11, 2.08]). One prior LRTI admission was associated with a borderline increased OR for a later asthma admission (1.12 [95% CI: 0.99, 1.26]) compared to no admissions, and the OR after two previous admissions was 1.49 ([95% CI: 1.05, 2.13]). HDU admission with bronchiolitis or LRTI was not associated with increased risk of later asthma admission.

**Conclusion** The relationship between early respiratory infections requiring hospitalisation, and later asthma admissions is complex. There is no consistent evidence that hospitalisation with respiratory infections in early life is causally linked to risk of later asthma admissions. However, repeated hospitalizations with infections may be linked to later asthma admissions by reverse causation.

**Abstract P179 Table 1** Admission with respiratory tract infections before two years of age and later asthma admission

		Number of bronchiolitis admission <2 years				Number of LRTI admission <2 years			
		0	1	2	≥3	0	1	2	≥3
Any asthma admission ≥ 2 years	Yes	13,949 (95%)	609 (4%)	135 (1%)	41 (0.3%)	14,406 (98%)	290 (2%)	32 (0.2%)	6 (0.0%)
	No	286,342 (91%)	24,250 (8%)	3,146 (1%)	739 (0.2%)	306,237 (97%)	7,470 (2%)	608 (0.2%)	162 (0.1%)