

factor for carbon monoxide (DLCO), functional residual capacity (FRCpleth) and maximum expiratory flow at 24, 50, 75% of vital capacity (MEF<sub>25/50/75</sub>) were assessed. The results were expressed as z-scores. The response to a cold air challenge (CACH) was considered positive if FEV<sub>1</sub> fell by >10% of baseline.

**Results** At the time of assessment, compared to the non SGA children, the SGA children had lower weight ( $p < 0.001$ ) and height ( $p = 0.002$ ). The SGA children had lower mean z-scores for FEV<sub>1</sub> ( $p < 0.001$ ), FEV<sub>1</sub>/FVC ( $P = 0.009$ ), DLCO ( $p = 0.013$ ), MEF<sub>25</sub> ( $p = 0.005$ ), MEF<sub>50</sub> ( $p = 0.002$ ) and MEF<sub>75</sub> ( $p < 0.001$ ) and a higher mean FRCpleth z-score ( $p = 0.010$ ). There was no significant difference regarding the proportion of SGA and non SGA children responding to a CACH ( $p = 0.091$ ).

**Conclusion** These results suggest that amongst very prematurely born children, being SGA at birth is associated with greater restrictive and obstructive (particularly of small airways) lung function abnormalities at school age.

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## G156 SICKLE CELL DISEASE IN MALAWIAN CHILDREN IS ASSOCIATED WITH RESTRICTIVE SPIROMETRY: A CROSS SECTIONAL SURVEY

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**Introduction** Children with sickle cell disease (SCD) more commonly exhibit clinical features of asthma than the general population. The pathogenesis of this observation remains unclear. However these individuals are at increased risk of acute chest syndrome<sup>1</sup>, and recurrent episodes of this complication strongly predict the development of sickle chronic lung disease<sup>2</sup>. It is postulated that lung function in these children is typically “obstructive” in early life and becomes “restrictive” in adulthood.

**Aim** To assess lung function and symptoms of asthma in Malawian children with SCD.

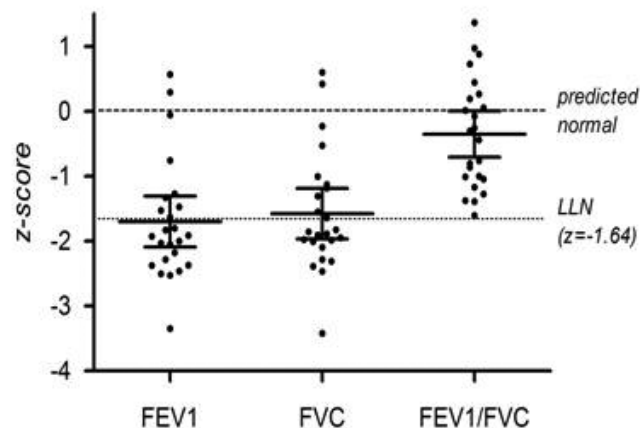
**Methods** Children with electrophoretically confirmed SCD attending our clinic were consecutively recruited to undergo spirometry and questionnaire screening of asthma symptoms. Forced expiratory volume in 1 second (FEV<sub>1</sub>), forced vital capacity (FVC) and FEV<sub>1</sub>/FVC ratio were compared with local and international reference ranges<sup>3,4</sup>. Asthma symptoms were recorded using the International Study of Asthma and Allergies in Childhood (ISAAC) questionnaire.

**Results** Twenty-four children aged 7 to 16 were recruited (median age 11.5 years, IQR 8 to 13.5). Mean spirometric indices represented as z-scores derived from international reference ranges<sup>3</sup> were low (Fig. 1): FEV<sub>1</sub> -1.64 (95% CI -2.04 to -1.23), FVC -1.49 (95% CI -1.90 to -1.09), FEV<sub>1</sub>/FVC -0.39 (95% CI -0.76 to -0.03). No individual exhibited evidence of an obstructive defect.

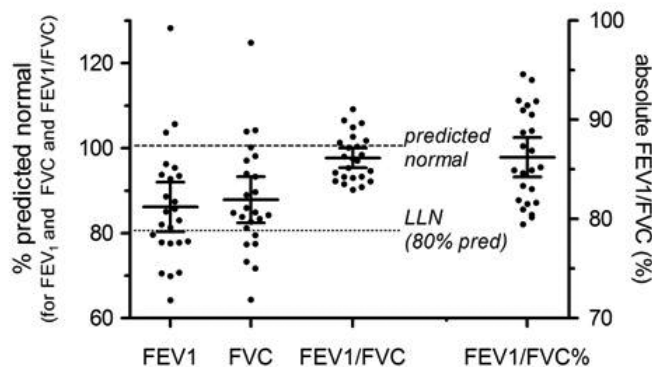
Comparison with local reference ranges<sup>4</sup>, represented as percentage of predicted value, revealed similar impairments (Fig. 2): FEV<sub>1</sub> 86.9 (95% CI 81.1 to 92.7), FVC 89.0 (95% CI 83.5 to 94.4), FEV<sub>1</sub>/FVC ratio 97.7 (95% CI 95.4 to 99.9). FEV<sub>1</sub>/FVC ratios are also given as absolute values (Fig. 2).

The prevalence of wheeze among the participants was lower than that recorded in a proximate African population<sup>5</sup> (Tab. 1).

**Conclusion** We have demonstrated lung function abnormalities suggestive of restrictive lung disease, and wheeze prevalence



Abstract G156 Figure 1



Abstract G156 Figure 2

comparable to that of a cohort without SCD. The progression of the pulmonary complications associated with SCD may differ significantly between populations suggesting an important role of environmental influences.

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## G157 OXYGEN PRESCRIBING FOR INPATIENTS IN THE UK

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**Background** Guidance from the British Thoracic Society, National Patient Safety Agency and British National Formulary advises that oxygen should be treated like other drugs in terms of appropriate

Abstract G156 Table 1

|                                  | Study participants<br>n (%) | Mozambican cohort <sup>5</sup><br>% |
|----------------------------------|-----------------------------|-------------------------------------|
| Wheeze at any time in past       | 4 (16.7)                    | 20.3                                |
| Wheeze in last 12 months         | 1 (4.2)                     | 11.2                                |
| Cough at night in last 12 months | 10 (41.7)                   | 22.7                                |

prescribing and monitoring. Whilst guidelines exist for the prescription of long-term oxygen [1], there is little available for its short-term use in children, similar to that for adults [2]

**Aims and Methods** Paediatric in-patient units in England were contacted to evaluate their practise regarding the use of oxygen based on the above guidelines. Information was obtained from the paediatric pharmacists and senior nursing staff in 68 units using a telephone questionnaire in 2010 and from paediatric pharmacists in 105 units using survey monkey in 2012.

**Results** Of the units contacted, 51.4% and 42% units respectively completed the survey in 2010 and 2012. The proportion of hospitals that reported they routinely prescribed oxygen increased from 11% to 42% between the two survey points. In 71% of units, prescribing was done on a drug chart. The oxygen was prescribed in percentage terms in 79% of units, and as flow rates in 81%. These were adjusted for the targeted saturations in 73%. Hospitals that have a protocol or guideline for prescribing oxygen have marginally improved from 40 to 43%.

**Conclusion** The results suggest that although there is an increase in the routine use of oxygen prescriptions, the majority of units neither have any guidelines for it nor use oxygen prescriptions. There is a need for the multidisciplinary development of guidelines and educational programmes to aid in the appropriate prescribing and delivery of oxygen in acute units.

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#### G158 RECRUITING ETHNIC MINORITY PARTICIPANTS TO A CLINICAL TRIAL: QUALITATIVE STUDY

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**Objectives** To compare the motives and experiences of different ethnic groups participating in a randomised double blind placebo-controlled trial of montelukast in preschool wheeze, and to assess parents' or guardians' understanding of trial procedures and their implications, including the collection of genetic material.

**Design** qualitative interviews with parents or guardians.

**Setting** Parents of children recruited following medical attendance with wheeze were interviewed in their homes.

**Participants** 42 parents, (20 of Bangladeshi origin, 10 white UK, 12 other ethnicities).

**Results** Anxiety related to wheezing was a common primary motive for trial enrolment. Parents viewed the trial as a route to improved treatment. Verbal delivery of trial information was more effective than study literature, especially for Bangladeshi families, with low parental literacy and high levels of trust in medical professionals contributing to this effect. All ethnic groups expressed a low

understanding and/or retention of essential study concepts such as randomisation and genetic testing.

**Conclusions** Bangladeshi families are particularly motivated to participate in clinical trials despite variable comprehension of study concepts. This motivation is more strongly contingent on strong researcher-subject rapport than on the quality of study literature. Trial teams seeking to recruit from South Asian populations should emphasise face-to-face verbal explanation of trial concepts and procedures and consider modified trial literature.

#### G159 THE USE OF STRUCTURED LIGHT PLETHYSMOGRAPHY TO ASSESS THE EFFECT OF FEEDING ON TIDAL BREATHING PATTERNS IN NEWBORNS

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**Aims** The aim of the study was to evaluate tidal breathing patterns in healthy newborns using Structured Light Plethysmography (SLP), and to compare the relative contributions of the ribcage and abdominal compartments in measurements taken pre and post feeding. The opportunities to non invasively measure neonatal lung function are limited. SLP is novel non-invasive method of assessing chest-abdominal wall movement, with potential application in a newborn and infant population.

**Methods** 17 healthy new-born (7 male and 10 female) from the Rosie Maternity Hospital were studied using SLP-based device, Thorax3D<sup>TM</sup>. 8 out of 17 were pre-term; corrected gestation age ranged from 35 to 40 weeks. Median weight was 2.866 kg (ranged from 1.985 kg to 4.43 kg). Newborns were in clinically stable condition with no oxygen requirement. No sedation was used.

Pre and post feeding measurements of tidal breaths: inspiration time (ti), expiration time (te), respiration rate. The following parameters were calculated from Konno-Mead (KM) plots: overall phase, spread, principal angle, rotation direction, and ribcage vs. abdomen asymmetry. Principal angle and spread were calculated by performing Principal Component Analysis on the samples comprising the KM loop data. Ribcage vs. abdomen asymmetry was found for each point on the KM loop by evaluating the distance between individual points and the expected response given a zero phase difference. The Brown Forsythe test was used to test equality of group of variances, the Wilcoxon test for equality in mean and median for the paired data, and Mann-Whitney U test for equality in mean and median for the unpaired data. In all cases, a two-tailed test was performed.

**Results** Respiratory rate, inspiratory and expiratory times remain constant pre and post feeds. The paired samples (n = 8) showed a significant change in variation of ribcage vs. abdomen phase (p < 0.025). The unpaired data (n1 = 13, n2 = 19) showed change in variation of the principal angle, the overall phase and ribcage vs. abdomen phase (p < 0.05). Each data collection took approximately 15 minutes including parental consent.

**Conclusion** The results indicate that newborn breathing pattern become more stable after feeding, and that SLP provides a non invasive method of assessment of tidal breathing pattern in infants.