are being used in further developments to care pathways within our Trust.

Abstract P118 Table 1 Percentage of patients with each indicator recorded as 'yes' in each group at 10 months

	Died	Survived
Severe disease	20% (40% unknown)	34% (6% unknown)
Recurrent admissions	47%	43%
Receiving/awaiting assessment for LTOT	40%	26%
MRC 4 or 5	87%	60%
Right heart failure	13%	11%
Previous ITU/NIV admission	40%	26%
Anorexia/significant weight loss over last 6 months	7%	11%
Current/past resistant respiratory organisms	13%	6%
Depression	7%	17%
Albumin <25 g/l	0%	0%
Dependence for most ADLs	53%	23%

REFERENCES

1. Gold Standards Framework. Prognostic indicator guidance. 2008. Available at: www.goldstandardsframework.nhs.uk/resources/GOLD%20standards%20framework/PIG_paper_final (accessed 19 Jul 2010).
2. **Celli BR,** Cote CG, Marin JM, *et al*. The body-mass index, airflow obstruction, dyspnoea and exercise capacity index in chronic obstructive pulmonary disease. *N Engl J Med* 2004;**350**:1005–12.

P119 COPD ASSESSMENT TEST SCORES: SHORT-TERM CHANGES DURING RECOVERY FROM COPD EXACERBATION

doi:10.1136/thx.2010.150987.20

S Chandramouli, S Huq, J Lagan, L Davies. *University Hospital Aintree, Liverpool, UK*

Introduction The COPD assessment test (CAT) is a brief questionnaire that seems to serve as a reliable measure of COPD health status. (1). Little is known about CAT scores in patients in the UK hospitalised with COPD exacerbations and the impact of factors such as age, COPD severity and co-morbidities on CAT scores during recovery.

Aims To record CAT scores in patients hospitalised with COPD exacerbations. To assess the impact of age, FEV_1 and co-morbidities on CAT score improvements.

Methods A random selection of patients presenting to our hospital between December 2009 and June 2010 with a clinical diagnosis of COPD exacerbation were approached. Those with radiological or clinical evidence of pneumonia, lung malignancy and bronchiectasis were excluded. All patients had evidence of fixed airflow obstruction on previous spirometry obtained from out-patient clinic visits and were current or ex smokers. Baseline demographics were recorded and patients were asked to complete CAT questionnaires on day 0 (day of hospital admission), day 2 and day 7.Questionnaires were completed at the bedside or, in those discharged, over the telephone. Charlson Comorbidity Indices (CCI) were calculated, using information from hospital case notes.

Results 83 patients (52 female) with a mean (SD) age of 67 (11) years and mean FEV_1 of 43% (18) predicted were recruited. The median (range) CCI score was 4 (1–11). Mean (SD) CAT scores on days 0, 2 and 7 were 30.6 (5.8), 28.3 (6.7) and 26.4 (7.2) units respectively. The difference in scores between days 0 and 2 was −2.4 units (paired t-test, $p<0.0001$) and between days 0 and 7 was −4.2 units ($p<0.0001$). See Abstract P119 Table 1 for correlation co-efficients.

Conclusions Mean CAT scores in this group of hospitalised patients were very high in keeping with our previous studies in similar patients who had high St George's Respiratory Questionnaire scores. (2). CAT scores improve significantly as early as 2 days after treatment for an exacerbation and improve further by day 7. In our cohort, there was no significant correlation between improvement in CAT scores and age, FEV_1 or CCI. Larger studies are needed to examine these relationships in more depth.

Abstract P119 Table 1

Variable (correlated to change between day 0 and 7 scores)	Spearman's co-efficient (rho)
Age (years)	r=−0.10 (p=0.34)
% predicted FEV_1	r=−0.20 (p=0.06)
Charlson comorbidity index	r=−0.06 (p=0.56)

REFERENCES

1. **Jones PW,** *et al*. Development and first validation of the COPD Assessment Test. *Eur Respir J* 2009;**34**:648–54.
2. **Davies L,** *et al*. *BMJ* 2000;**321**:1265–8.

P120 OBSERVATIONAL STUDY OF ACUTE ADMISSIONS WITH NON-INFECTIVE ASTHMA AND COPD TO PERTH ROYAL INFIRMARY FOLLOWING THE ERUPTION OF ICELANDIC VOLCANO EYJAFJALLAJOKULL AND SUBSEQUENT ASH CLOUD FORMATION

doi:10.1136/thx.2010.150987.21

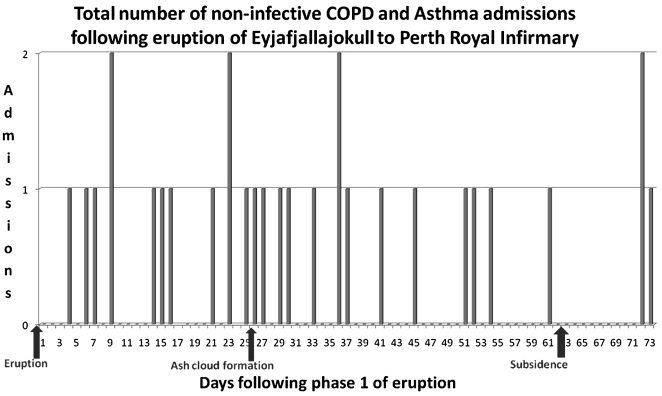
M E M Wilkie, M Anderson, S Schembri. *Perth Royal Infirmary, Perth, UK*

Introduction and objectives Eyjafjallajokull, a volcano in Iceland erupted on the 20th March 2010 after a prolonged period of seismic activity starting late 2009. Subsequent ash cloud formation on 14th April caused considerable disruption to Scottish and European airspace. Studies performed in Japan and the British West Indies showed that noxious by-products including sulphur dioxide, have a significant impact on asthma and COPD admissions and severity.[1 2] The aim of this study was to record trends of hospitalisation for non-infective exacerbations of asthma and COPD from eruption until volcano quiescence.

Methods Data of all patients admitted to PRI over the period of 20 March 2010 to 31 May 2010 with shortness of breath was collected. Patients included were those with a diagnosis of non-infective asthma or COPD. Other admission diagnoses were excluded. We recorded diagnosis, age and sex.

Results 100 patients were admitted with shortness of breath during the study period. 12 patients were diagnosed with non-infective asthma (mean age 52, M:F=5:7) and 17 with non infective COPD (mean age 76, M:F=5:12). The preponderance of female admissions has been noted in previous studies.[2] Ash cloud formation occurred at day 26 with closure of Scottish airports at day 27, 45, 51 and 58. Ash production subsided day 63. We observed a cluster of admissions from day 22 to day 37.

Conclusions The cluster of admissions associated with ash cloud presence suggests the possibility of a causative effect. Our study is however limited by the duration of data collection and the absence of a comparative data from previous years.



Abstract P120 Figure 1 Total number of non-infective COPD and asthma admissions following eruption of Eyjafjallajokull to Perth Royal Infirmary.

REFERENCES

1. **Forbes J,** Jarvis D, Potts J, *et al*. Volcanic ash and respiratory symptoms in children in the island of Monserrat, British West Indies. *Occup Environ Med* 2003;**60**:207–11.
2. **Ishigami A,** Kikuchi Y, Iwasawa S, *et al*. Volcanic Sulfur dioxide and acute respiratory symptoms on Miyakejima island. *Occup Environ Med* 2008;**65**:701–7.

P121 FEASIBILITY OF PERFORMING VALID SPIROMETRY IN RURAL INDIA: PRELIMINARY RESULTS FROM A POPULATION STUDY ASSESSING THE PREVALENCE OF COPD

doi:10.1136/thx.2010.150987.22

[1]R Mukherjee, [1]V C Moore, [2]S Purkait, [2]P Goon, [3]C J Warburton, [3]B Chakrabarti, [4]P M A Calverley. *[1]Department of Respiratory Medicine & Physiology, Birmingham Heartlands Hospital, Birmingham, UK; [2]Moitri Swasthya Kendra, Shramajibi Swasthya Udyog, Chengail, West Bengal, India; [3]Aintree Chest Centre, University Hospital Aintree, Liverpool, UK; [4]Clinical Sciences Centre, University Hospital Aintree, Liverpool, UK*

Introduction Spirometry remains the cornerstone in the diagnosis of Chronic Obstructive Pulmonary Disease (COPD). Little is known regarding the determinants and prevalence of COPD in rural India. We undertook a population-based study in Howrah District, West Bengal,India at a community-based primary care clinic of a voluntary organisation to test the feasibility of spirometric estimation of the prevalence of COPD.

Methods Spirometry was performed on all adults >35 years attending the clinic. Questionnaire data (capturing respiratory symptoms, occupation, tobacco smoking history, indoor stove use) were gathered for each subject. All spirometric data were examined by an independent UK-based clinical scientist.

Results Spirometry was performed in 315 patients over 3 months; 18% (58/315) of measurements were deemed good quality as per ERS guidelines; 45% (143/315) had the correct shaped curve; hence 64% (201/315) of all spirometries were deemed adequate for FEV_1 analysis. Poor quality traces were noted in 36% (n=114) and hence were excluded from analysis. Of the adequate spirometries (n=201, mean age 51 years (SD 12.1); 39% male), 84 (42%) were normal, 102 (51%) exhibited mild airflow obstruction, 12 (6%) moderate airflow obstruction and 3 (1.5%) severe airflow obstruction according to British guidelines. Difference in FEV_1% predicted between never/ex smokers and current smokers was significant (p=0.029). Indoor stove use was ubiquitous in this population and did not correlate with FEV_1 percent predicted.

Conclusion In a rural Indian setting, valid spirometry can be obtained in two-thirds of adult patients attending a community clinic with 58% of patients in this sample exhibiting at least mild COPD with a history of current smoking being associated with the development of airflow obstruction.

Respiratory physiology: old and new concepts

P122 THE USE OF IMPULSE OSCILLOMETRY (IOS) TO STUDY FRACTAL SCALING AND SAMPLE ENTROPY IN AIRWAY RESISTANCE TIME SERIES IN SEVERE ASTHMA

doi:10.1136/thx.2010.150987.23

I Umar, D Desai, S Corkill, M Shelley, A Singapuri, C Brightling, S Siddiqui. *University of Leicester, Leicester, UK*

Introduction Severe asthma affects airway calibre and can be monitored using IOS. Sample entropy (SampEn) is a measure of complexity and is defined as the probability that sequences of patterns (template size) in time series which are initially closely related, that is, within a fraction of the standard deviation (tolerance level) of the time-series remain so within subsequent time frames. Fractal scaling is a measure of self similarity and scale invariance measured in a time-series and quantifies the memory found within as a consequence. We hypothesised that fractal scaling and SampEn will be useful in characterising severe asthma.

Methods 66 GINAstage 4–5 severe asthmatics (Mean(Sem) age; 54.1(1.4), Sex M:F; 31:35, post-bronchodilator FEV_1% predicted; 81.02 (2.7)%) and 27 Controls (Mean(Sem) age; 48.4(2.2), Sex M:F;9:18, post-bronchodilator FEV_1% predicted; 108.2 (2.8)%) were recruited. Impulse oscillometry was performed at 5–35 Hz, with impulses triggered every 0.2 s for 150 s, at baseline and 15 min after 400 mcg inhaled salbutamol. Detrended fluctuation analysis was used to derive the fractal scaling exponent α_1. SampEn was derived using a custom program. SampEn and α_1 were both obtained from airway resistance at 10 Hz over the 150 s time-series. Triplicate measurements of 150 s were repeated in 18 randomly selected asthmatics from our cohort after 6 months.

Results SampEn was significantly increased compared to controls (Abstract P122 Table 1) and correlated significantly with exacerbation frequency from the previous 12 months (Asthma Baseline- p=0.007, rs=0.3; Post-Bronchodilator- p=0.009, rs=0.3). Fractal scaling was also found to be present in airway resistance in severe asthma (α_1=0.94 (0.03)) and showed an inverse relationship with SampEn (p=0.0352, r=−0.4). Increased SampEn was associated with worse ACQ scores (p=0.027, rs=0.3) and lower AQLQ scores (p=0.023, rs=−0.2). SampEn measurements were repeatable (an Intra-class correlation of 0.74) in the triplicate series. In keeping with other studies, airway resistance was significantly increased in severe asthma.

Conclusions SampEn a measure of complexity is (1) increased in severe asthma (2) a repeatable measure (3) associated with a lower quality of life and exacerbation frequency. The ability of this technique to monitor asthma stability and to predict future exacerbations by stochastic modelling needs to be explored.

Abstract P122 Table 1

Asthma n=66 Controls n=27	Baseline		Post-bronchodilator	
	Controls	Asthma	Controls	Asthma
Resistance at 10 Hz (KPa/(l/s))	0.34(0.02)	0.48(0.02)†	0.31(0.02)*	0.42(0.02)* †
SampEn	0.09(0.02)	0.16(0.02)†	0.09(0.02)	0.12(0.01)† *

Mean (sem) data.
*Comparison against baseline p<0.05.
†Comparison against control p<0.05.
*/†Paired t-tests/equivalent. R10-approximated to total airway resistance in our cohort and had a coherence of 0.9, SampEn: template size=2 and tolerance level=0.2.