collected pre and post SLT using an in-house designed symptoms-based VCD questionnaire (scale 0–25 with high score indicating poor control). Pre and post therapy frequency of VCD attacks and the annual pre and post therapy hospital admission rates were also collected.

Results Demographics – Two hundred and forty nine patients with nasendoscopy confirmed VCD diagnosis completed SLT. This cohort was comprised of 200/249 (80%) females with a mean age of 45 years (range 14–77), mean BMI 30.9 kg/m², 203 (82%) had associated asthma diagnosis, of which 125 (50%) were on maintenance oral corticosteroids.

Symptom management – Frequency of attacks dropped following SLT with 179 (72%) reporting daily attacks pre-SLT to 25 (10%) noting daily symptoms post-SLT. A significant reduction in patient-reported symptoms was noted post SLT; pre vs. post therapy; mean ($\pm$ SD) = 16.57 (3.96), 7.75 (4.82) respectively, $p < 0.0001$. See Figure a.

Hospital admission prevention – significant reduction in hospital admissions was noted in the year post SLT intervention: pre vs. post therapy mean ($\pm$ SD, range) = 2.44 (4.84, 0–31); 0.31 (1.01, 0–7); $p < 0.0001$.

Conclusion SLT improves VCD symptoms scores, reduces VCD attacks frequency and hospital admissions. Further work is needed to improve overall VCD recognition and management through development of a national VCD database and regular networking of clinicians working in this area.

REFERENCE

- 1 Ayres JG, Mansur AH. Vocal cord dysfunction and severe asthma. *American Journal of Respiratory and Critical Care Medicine* 2011;**184**(1):2–3.

P227 STUDY OF CLINICAL CHARACTERISTICS OF PATIENTS WITH VOCAL CORD DYSFUNCTION

N Pargeter, AH Mansur. *Birmingham Heartlands Hospital, Birmingham, UK*

10.1136/thoraxjnl-2016-209333.370

Introduction Vocal Cord Dysfunction (VCD) is a poorly understood condition. It co-exists with and mimics asthma resulting in misdiagnosis and treatment of both conditions.¹ To better understand this population we established a VCD registry of referrals to our VCD centre extending over a 10 year period.

Method The data recorded in the registry include patient demographics, symptoms, triggers, concomitant conditions and quality of life measures. Patients were asked to complete a questionnaire of symptoms/triggers and lung function tests were conducted.

Results Over a period of 10 years there were 476 consecutive referrals to our service with probable VCD diagnosis. N = 249 (52%) had nasendoscopy-confirmed VCD diagnosis and adequate clinical details.

Demographics – The majority of referrals were from the severe asthma clinic (150/249, 60%), Female: Male = 200:49, mean age 45 years (range 14–77), BMI Mean: 30.9kg/m², range: 21–67.

Concomitant conditions: Gastro-oesophageal reflux 172 (69%); Globus pharyngeus 136 (55%); Rhinitis 92 (37%); Asthma 203 (82%). Spirometry: Mean actual FEV1: 2.23L (SD $\pm$ 0.86), mean FEV1% pred: 87.91 (SD $\pm$ 26.6), mean FEV1/FVC ratio = 74.5 (SD $\pm$ 13.0). Psychological status - Hospital anxiety and depression score: Anxiety: mean 11 (range 2–21); depression: mean 8 (range 0–18).

The clinical features of this population are provided in the table below.

Conclusions Patients with VCD present with a definable range of triggers and symptoms and suffer from disabling and frequent comorbidities including psychological disease which clinicians need to be aware of when managing the condition. Further work is required to define the disease natural history and long-term outcomes through establishment of a properly designed UK wide VCD registry.

Abstract P227 Table 1

RESULTS

VCD Presentation	Number (%)
Sudden onset attacks	219 (88)
Dyspnoea	237 (95)
Difficulty breathing IN	229 (92)
Tight throat	224 (90)
Inspiratory wheeze	211 (85)
Symptoms improve with inhaler	51 (20)
VCD Triggers	Number (%)
Inhaled irritants	182 (73)
Exertion	178 (73)
Stress	168 (67)
Coughing	162 (65)
Reflux	130 (52)
Treatment	Number (%)
Inhaled Corticosteroids	224 (90)
Oral Corticosteroids	125 (50)
Speech & Language Therapy	249 (100)
Psychotherapy	76 (31)
Heliox	11 (4)
Tracheostomy	3 (1)

REFERENCE

- 1 Ayres JG, Mansur AH. Vocal cord dysfunction and severe asthma. *American Journal of Respiratory and Critical Care Medicine* 2011;**184**(1):2–3.

P228 IS THE BROMPTON BPAT A USEFUL TOOL TO ASSESS BREATHING PATTERN DISORDER IN ASTHMA?

¹SJ Todd, ²R Livingston, ¹L Grillo, ³A Menzies-Gow, ³J Hull. ¹Physiotherapy, Royal Brompton Hospital, London, UK; ²Physiotherapy, University College London Hospital, London, UK; ³Asthma and Allergy, Royal Brompton Hospital, London, UK

10.1136/thoraxjnl-2016-209333.371

Introduction Breathing pattern disorder (BPD) is a prevalent cause for persistent dyspnoea in patients with asthma. The diagnosis of BPD is difficult and currently relies exclusively on subjective assessment with no reliable diagnostic tools currently validated to support a clinical assessment.

Aim To determine if the Brompton Breathing Pattern Assessment Tool (BPAT) has value in the assessment of BPD.

Method We audited an objective scoring tool, the BPAT, in patients with asthma and/or unexplained dyspnoea completing a systematic multi-disciplinary assessment. The BPAT (score 0 to 14) evaluates aspects of breathing (including; rate, flow, pattern, rhythm and air hunger). This was compared against BPD diagnosis made by current MDT practise. BPAT measures were also compared with indices of dyspnoea/disease control; e.g. walking test, Dyspnoea 12 (D12), Nijmegen and Asthma Quality of Life Questionnaire (AQLQ).

Results 75 patients; n = 54 females, were divided into 3 groups by diagnosis (asthma, asthma+BPD and BPD alone). BPAT was

statistically significantly different between all groups (Table). It also correlated statistically significantly with both the D12 score ($r = 0.586$, $N = 23$, $p = 0.003$) and Nijmegen score ($r = 0.418$, $N = 24$, $p = 0.042$) in the BPD group. There was no relationship between BPAT and FEV₁% predicted or 6MWT distance.

Conclusion The BPAT score was higher in those patients diagnosed with BPD both with and without asthma. The BPAT score also correlates with both the D12 and Nijmegen score in patients diagnosed with BPD. This suggests it detects and characterises common aspects of BPD. Further work is now needed to validate the BPAT and determine its responsiveness to intervention.

Abstract P228 Table 1 Median scores of outcomes per group

Group (M:F)	Asthma n = 14 (6:8)	Asthma+BPD n = 37 (9:28)	BPD n = 24 (6:18)
Age median (range)	44.5 (17–67)	42.5 (19–59)	45 (16–73)
BPAT	3 (0–8)*#	7 (2–12)#	6.5 (3–13)*
D12	19 (6–29)	23 (5–37)	18 (4–32)
FEV ₁ %	59.4 (114.5–32.6)	76.5 (127.2–39)	99.8 (60.7–132.4)
AQLQ	3.53 (2.10–5.30)	2.7 (1.2–4.47)	3.6 (2.9–4.73)

($p < 0.05$ *Asthma v BPD, #Asthma v Asthma+BPD, **BPD v Asthma+BPD)

P229 BREATH-TAKING OUTCOMES: EVALUATION OF A SPECIALIST BREATHLESSNESS CLINIC

¹L Douglas, ²A English, ²GP Obita, ³SP Hart, ³MG Crooks. ¹Castle Hill Hospital, Hull and East Yorkshire Hospitals NHS Trust, Hull, UK; ²Dove House Hospice, Hull, UK; ³Hull York Medical School, Hull, UK

10.1136/thoraxjnl-2016-209333.372

Background Breathlessness is distressing for patients and is a common reason for emergency department attendance. Chronic refractory breathlessness is associated with anxiety, embarrassment and fear, and effective management is essential to improve quality of life and reduce hospital admissions.¹ Interventions such as breathing control, activity pacing and anxiety management are beneficial.² This study examined the effect of attending a dedicated respiratory physiotherapist led breathlessness service on patient reported outcomes.

Method Patients attending the breathlessness clinic between April 2015 and April 2016 completed Numerical Rating Scales (NRS) out of 10 to grade their breathlessness. Data were collected before and 1–2 weeks after clinic attendance. Lower NRS scores represented a lower symptom burden. A change of 1 or more on the NRS was considered clinically significant. Responses were compared using t-tests and Wilcoxon signed-rank tests. Data are presented as mean $\pm$ SD.

Results Fifty-two patients attended the breathless clinic during the study period (mean age 73, range 49–92 years). Patients had a range of diagnoses causing their breathlessness with idiopathic pulmonary fibrosis (44.2%), lung cancer (19.2%), and non-specified interstitial lung disease (11.5%) being most common.

Significant improvements were observed across all domains. Average breathlessness experienced in the past 24 hours reduced from 3.9 ± 1.7 to 3.6 ± 1.6 ($p = 0.001$). The worst breathlessness experienced in the past 24 hours reduced by 1 point to 6.3 ± 1.9 ($p < 0.001$). The distress experienced from breathlessness reduced from 5.8 ± 6.4 to 4.8 ± 4.8 ($p < 0.001$). Patients' perceived ability to cope with their breathlessness improved by 1 point ($p < 0.001$).

Conclusions A specialist breathlessness clinic provided a valuable service for patients with chronic refractory breathlessness. Significant, clinically meaningful benefits were observed in terms of the severity of breathlessness that patients experienced. Furthermore, patients perceived a reduction in distress and increased ability to cope.

REFERENCES

- Ekström M, Abernethy A, Currow D. The management of chronic breathlessness in patients with advanced and terminal illness. *BMJ* 2015;**349**:g7617.
- Higginson IJ, Bausewein C, Reilly C, et al. An integrated palliative and respiratory care service for patients with advanced disease and refractory breathlessness: a randomised controlled trial. *Lancet Respiratory Medicine* 2014;**2**:979–87.

P230 EVALUATION OF A NOVEL DYSFUNCTIONAL BREATHING SERVICE

¹CP Winfield, ²C Moffat, ²R Hurst, ²JP Fuld. ¹University of Cambridge School of Clinical Medicine, Cambridge, UK; ²Cambridge University Hospitals, Cambridge, UK

10.1136/thoraxjnl-2016-209333.373

Introduction and objectives Despite multiple trials, there remains a lack of consensus on the optimum management of dysfunctional breathing patients.¹ This service evaluation considers the effectiveness of a novel, multi-factorial intervention, consisting of cardiopulmonary exercise testing (CPET), explanation of physiological findings and breathing retraining, for those suffering from dysfunctional breathing.

Methods Patients who had a history of likely dysfunctional breathing combined with CPET evidence of dysfunctional breathing, hyperventilation or lack of underlying pathology were invited to attend a joint consultation with a respiratory physician and a physiotherapist. To date, fourteen patients have attended initial consultation and six patients have completed full follow up. All patients received chest consultant clinical consultation where their CPET findings were reviewed with them, with particular emphasis on fitness, evidence of underlying disease and breathing pattern. Initial physiotherapist consultation was followed by a bespoke breathing retraining programme. The Nijmegen questionnaire and the self-evaluation of breathing questionnaire formed the main outcome measures. Patients also completed a service satisfaction questionnaire, rating 6 aspects of the service on a scale of 1–5, with 5 being most satisfied. Paired t-tests were used to calculate significance of pre and post values.

Results Fourteen patients have so far been assessed in the initial consultation. Their diagnosis and breathing patterns, demonstrated on CPET, are described in Table 1. Average pre-trial Nijmegen Questionnaire scores demonstrated an improvement post-intervention from the 6 patients who have completed the intervention (26.5 pre to 21.2 post, $p = 0.0465$). Patients also completed the self-evaluation of breathing questionnaire, before and after the intervention. The average score decreased from 27.2 pre-trial to 15.0 post-trial ($p = 0.0098$). No changes in functional residual capacity controlled pause (10.0s pre to 11.8s post, $p > 0.05$) or total lung capacity breath hold (11.8s pre to 21.0s post, $p > 0.05$) were evident. The average patient satisfaction score was 28.6/30.

Conclusion A novel combined physiological and physiotherapist based intervention may be effective in supporting symptoms in people with dysfunctional breathing.