Methods DM patients with daytime sleepiness or symptoms of respiratory failure were referred to the Regional Sleep Centre. They were admitted overnight for sleep study and respiratory assessment. If there was central hypoventilation causing respiratory failure, or obstructive sleep apnoea (OSA), they were offered non-invasive ventilation (NIV) or continuous positive airway pressure (CPAP) respectively. People without sleep disordered breathing with daytime sleepiness were assessed for modafinil, an alerting drug.

Results From May 2011 to May 2015, 120 people with DM had investigations. Mean age was 47 (SD 13, range 18–74), mean BMI 28 kg/m^2 (7, 16–53) and mean Epworth Sleepiness Score 13 (5, 2–24). Mean Muscular Impairment Rating Scale was 3.85 (0.7, 2–5).

Mean FEV1 was 70% predicted (SD 22), FVC 68% predicted (27), with a >15% supine fall in FVC in 18%. PI max, PE max or SNIP were below 50% predicted in 73% of people.

In this cohort, 32 people (27%) had raised CO_2 >6.2 mmHg; NIV was trialled and provided at home in 29 (90% of those in whom it was indicated). Twelve people (37%) have continued this, 17 (53%) have returned it.

Twenty one people (18%) were found to have OSA and 19 commenced CPAP (90% of those in whom it was indicated). This was continued by seven people (33%) and returned by 12 (57%).

Thirty seven people (31%) found to have no evidence of significant sleep-disorderd breathing were assessed for modafinil. Twenty seven people (73% of those in whom this was indicated) attended clinic for this: 16 (43%) had good effect from modafinil and continue on it, 8 (22%) had no effect or intolerance; in three (8%) it was not prescribed.

Thirty people (25% of total cohort) had no sleep disordered breathing and required no further input.

Conclusions DM is a heterogeneous disorder, with varying BMI, sleepiness, muscular and respiratory impairment. Overall, only 35% of the total cohort gained benefit from CPAP, NIV or modafinil and continued with this therapy.

P116 IMPACT OF BARIATRIC SURGERY ON OSAS: A 4-YEAR EXPERIENCE

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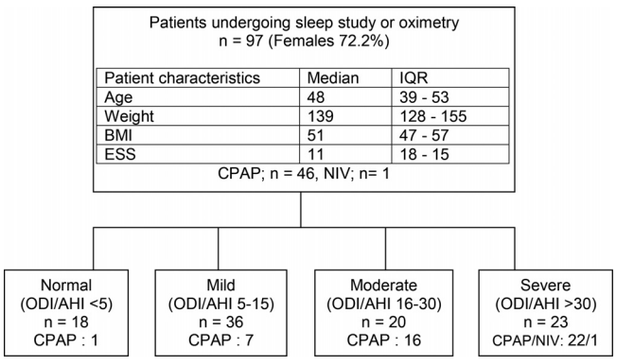
Background Obstructive Sleep Apnoea Syndrome (OSAS) is common in morbidly obese patients. Previous studies indicate bariatric surgery reduces the severity of OSAS but may not cure it. We explored the impact bariatric surgery on patients who were commenced on CPAP prior to surgery.

Methods All morbidly obese patients who underwent bariatric surgery at our institution, between June 2010 and May 2014 who underwent sleep study (SS) or oximetry prior to bariatric surgery were included. The primary end point was cure (oximetry off CPAP showing either ODI less than 5 or ODI 5–15 with ESS <10 and no other symptoms of SDB) from OSAS. Secondary end points were weight loss achieved, improvement in OSAS and improvement in ESS. All data were obtained from electronic bariatric surgery and sleep service databases.

Results 184 patients underwent bariatric surgery. 97 (52.7%) had SS or oximetry prior to surgery. (Figure 1) Mean ODI was 25 (95% CI 19–30) and ESS 12 (95% CI 10–13). Out of 46 patients considered for CPAP, 45 continued using CPAP perioperatively, one discontinued after failed trial. 20 (43.4%) patients were considered cured from OSAS by 12–24 months. 17 (36.9%) patients became asymptomatic and returned CPAP were considered to be cured clinically but not had SS post surgery. At 12 months post bariatric surgery, there were significant ($P < 0.0001$) reductions in various parameters; means of difference in ODI 34, ESS 10 and BMI 17.8.



Abstract P116 Figure 1 Patient characteristics. ESS = Epworth Sleepiness Score, ODI = Oxygen Desaturation Index, AHI = Apnoea Hypopnoea Index

Discussion and conclusion In contrast to the meta-analysis (Greenburg *et al*. 2009) in which 62% had residual disease in our cohort 80% had clinical cure and they had a lower post-op ODI (7.1) in spite of comparable weight loss. Even though our patients had similar pre-op BMI but the mean pre-op ODI was less than most reported studies the reason for which is not clear but might be responsible for a much higher cure rate.

REFERENCE

1 Greenburg DL, Lettieri CJ, Eliasson AH. Effects of surgical weight loss on measures of obstructive sleep apnea: a meta-analysis. *Am J Med* 2009;**122**:535–42

P117 COMPARISON OF THE EFFECTS OF CONTINUOUS POSITIVE AIRWAY PRESSURE AND MANDIBULAR ADVANCEMENT DEVICES ON SUBJECTIVE DAYTIME SLEEPINESS IN PATIENTS WITH OBSTRUCTIVE SLEEP APNEA: A NETWORK META-ANALYSIS

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Background Obstructive sleep apnoea (OSA) is associated with increased daytime sleepiness. Previous meta-analyses have shown that both continuous positive airway pressure (CPAP) and mandibular advancement devices (MADs) reduce the Epworth Sleepiness Score (ESS), a common measure of daytime sleep propensity. However, no meta-analysis has yet identified which treatment is superior in reducing ESS, perhaps due to a lack of studies directly investigating the two treatments. In addition, the effect of CPAP usage on ESS has yet to be thoroughly explored.

Methods We searched Medline and the Cochrane Library up to the end of May 2015 to identify randomised controlled trials in OSA investigating the effect of CPAP and/or MADs against each other or an inactive control (IC, placebo or no treatment) on ESS. A network meta-analysis was used to incorporate both

direct and indirect evidence to estimate the difference between the three treatment groups on ESS. Meta-regression was used to assess the influence of CPAP usage and average baseline patient characteristics on the effect of CPAP compared to ICs.

Findings A total of 67 studies comprising 6873 patients were included in the meta-analysis. Of these, 51 (5898 patients) assessed CPAP against an IC. CPAP and MADs were estimated to reduce ESS by 2.5 (95% CI 2.1,2.9) and 1.7 (95% CI 1.1,2.3) points respectively compared to an IC. CPAP was estimated to reduce the ESS by a further 0.8 points compared to MADs (95% CI 0.1,1.4; p = 0.015). However, there was some suggestion of publication bias in favour of CPAP which may have inflated this effect. There was no evidence that studies reporting higher CPAP usage also reported larger treatment effects.

Interpretation Both CPAP and MADs are effective treatments for reducing daytime sleepiness in patients with OSA. CPAP appears to be the most effective treatment and should be recommended for more severe or sleepier OSA patients. However, MADs are a suitable second-line treatment should CPAP not be tolerated.

P118 FACTORS AFFECTING CONCORDANCE WITH CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) IN OBSTRUCTIVE SLEEP APNOEA SYNDROME (OSAS)

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Introduction and objectives The benefits of continuous positive airways pressure in the treatment of obstructive sleep apnoea syndrome have been well established. Despite this, CPAP adherence remains a significant issue resulting in many patients not receiving adequate treatment. A number of variables have been suggested as contributing to non-concordance, however study results have been inconsistent. Studies assessing long term concordance, suggest severity of OSAS and sleepiness to be good predictors of this. This scientific survey looked at the influence of co-morbidity and the severity of OSAS as represented by apnoea hypopnoea index (AHI) at diagnosis on the usage and concordance with CPAP.

Methods Data from 230 patients completing annual follow up after initiation of CPAP by 31st December 2014 was collected retrospectively. The presence and severity of co-morbidity was assessed by the Adult Co-morbidity Evaluation- 27 (ACE-27) score. CPAP usage per day was averaged over the preceding year. The association between usage and initial AHI (data available for 207 patients) was analysed by linear regression. The association between usage and ACE-27 score was analysed by ANOVA.

Results The regression coefficient for initial AHI against CPAP usage shows a statistically significant effect ([p = 0.00126] fitted equation: concordance = 4.161 + 0.024 × AHI). There was no significant difference in CPAP usage between different ACE-27 groups. Further analysis of individual co-morbidities revealed significance in four categories; cardiac arrhythmia (p = 0.031), coronary artery disease (p = 0.006), congestive heart failure (p = 0.045) and malignancy (p = 0.001).

Conclusion AHI at diagnosis remains a strong determinant of CPAP concordance at 1 year. Severity of co-morbidity cannot be conclusively demonstrated to influence usage however further studies into overall and specific co-morbidities are warranted.

Phenotypes and response to treatment in COPD

P119 CHARACTERISING NON-EOSINOPHILIC COPD

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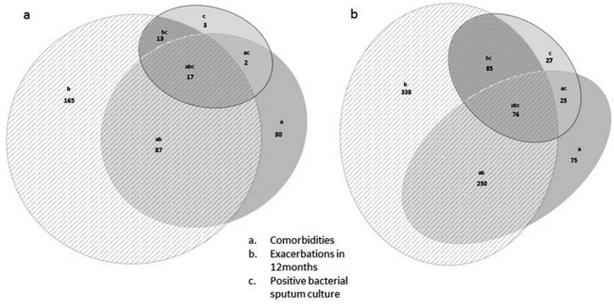
Background Phenotypes of COPD are increasingly recognised, with classification centred on inflammation and in particular microbes and inflammatory markers within the airways and peripheral blood. Studies focusing on eosinophilic inflammation in COPD have shown the validity of airway and peripheral eosinophilia as a marker to direct treatment with corticosteroids. However, the majority of COPD patients have low sputum and peripheral eosinophils, with a large proportion showing raised sputum neutrophils at exacerbation and stable state. The characteristics of this 'Non-eosinophilic' group are less well defined, making the identification of biomarkers and target pathways for drug development more challenging.

Methods Baseline data from patients with COPD, previously recruited to a study identifying biomarkers was analysed using SPSS (SPSS version 22, IBM Corp, released 2013, Armonk, NY). A cut off of 3% sputum eosinophils was used to distinguish 'Eosinophilic' and 'Non-eosinophilic' groups. Parametric and non-parametric analyses were performed where appropriate.

Results Of 149 patients, 96 had <3% sputum eosinophils, with a median age of 69.5 years (47–88 range). There were no differences in gender and proportion of smokers between the two groups. There was an increase in percentage sputum neutrophils in the non-eosinophilic group (mean difference 15%, 95% confidence interval 9–17%, p = 0.01). The non-eosinophilic patients had more exacerbations/person/year compared to the eosinophilic group (3.52 vs. 3.11); this was independent of inhaled corticosteroid use. There were more significant co-morbidities in the non-eosinophilic group compared to the non-eosinophilic group (78% vs. 61%, p < 0.01). Co-morbidity was defined as the presence of cardiovascular disease, endocrine disorders, depression, or musculoskeletal disease.

There were more positive sputum cultures in the non-eosinophilic group compared to the eosinophilic group (33% vs. 11%, p = 0.16). There was also an increase in colony forming units in the non-eosinophilic group compared to the eosinophilic group (mean fold difference 0.4, 95% CI 0–0.8, p = 0.05).



Abstract P119 Figure 1 Venn digram showing relationship of characteristics of eosinophilic (a) and non-eosinophilic (b) COPD, using absolute numbers