

average time taken for oximetry is 15 minutes compared with 75 minutes for LCSS (times were pooled from 5 Welsh sleep centres). We proposed an investigative approach that combined a screening algorithm that would allocate high probability patients to oximetry and low probability patients to LCSS. High probability subjects with negative oximetry also proceeded to LCSS. This 2-step approach has been recently tested with a subsequent sensitivity of 97% and specificity of 87%.² The aim of our study was to assess if our interpretation of this approach reduced investigation time for the diagnosis of OSA.

Methods We recruited consecutive sleep referrals over a 5 month period. A screening algorithm was employed. The following risk factors were used to score referrals (1) Snoring, Apnoea (2) Daytime somnolence (3) Hypertension, Obesity, Large neck size 0.2/3 positive factors made the referral high probability; 2/3 negative-low probability. A referral with inadequate information went straight to LCSS. A high probability patient with subsequent negative oximetry proceeded to LCSS.

We compared the total and average time taken with our algorithm against a strategy (control arm) of LCSS for every patient. The study was powered for 50 patients.

Results N=50. Median age 53 years, 34 were male. See figure 1 for outcomes.

For the control arm, assuming every patient had LCSS, the total investigation time for the 50 patients was 3750 minutes with an average time of 75 minutes per patient.

For the algorithm arm, the total time was 2715 minutes with an average time of 54.3 minutes per patient.

Average time saving – 20.7 minutes per patient.

Conclusion We propose that allocating high probability subjects to oximetry and using LCSS for low probability subjects and for oximetry negative high probability subjects results in significant time and resource savings.

References

1. Thorax 2005; 60 (ii):37.
2. Thorax 2011; 66.

P264 NOCTURNAL HEART RATE IN PATIENTS WITH OBSTRUCTIVE SLEEP APNOEA

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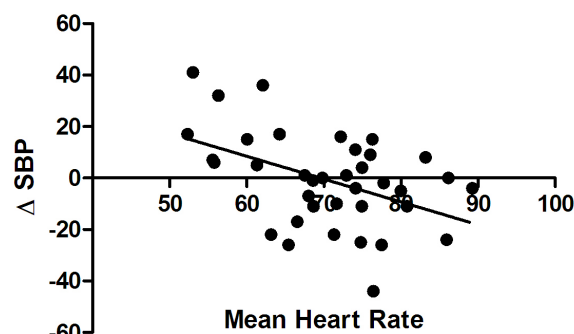
Background Obstructive sleep apnoea (OSA) is the most common sleep disorder and a significant risk factor for cardiovascular disease. In addition, heart rate is an important predictor of hypertension and a risk factor for cardiovascular morbidity and mortality. We hypothesised that changes of nocturnal heart rate in OSA are associated with changes in blood pressure following commencement of continuous positive airway pressure (CPAP) therapy.

Methods A total of 1848 nocturnal pulse oximetries (two consecutive nights) were screened to identify patients with OSA in a tertiary referral centre for sleep disorders. Demographics and pulse oximetry data were recorded at baseline. To assess nocturnal changes heart rate (HR) was compared between the first hour and the last hour of the night-time recording. In patients who were diagnosed with OSA, we further recorded daytime sleepiness, blood pressure, and body weight at three months and one year follow up.

Results Out of all the screened pulse oximetries, a complete dataset of 58 patients with OSA (mean 4% ODI 28.9 (3.3) h⁻¹, 36 males, age 49.4 (1.2) years, weight 109.7 (3.6) kg) and 57 without OSA (mean 4% ODI 2.0 (0.1) h⁻¹, 34 males, age 46.4 (1.7) years, weight 95.0 (7.0) kg) was identified. Pulse rise index, mean HR, and HR of the first and last hour of recording were higher in the OSA group (p<0.0001), whilst oxygen saturation was lower in the OSA group (p<0.0001).

Reduction in nocturnal HR vs mean SpO₂ (r=-0.39, p<0.01), mean nocturnal HR vs mean SpO₂ (r=-0.4, p<0.01) and average HR vs systolic blood pressure (r=-0.42, p<0.05) correlated inversely (Figure).

Conclusion Nocturnal HR is higher in OSA patients than in control subjects likely because of an enhanced sympathetic activation. Changes in nocturnal HR of OSA patients established on CPAP at one year follow up predict changes in systolic but not in diastolic blood pressure or body weight.



Abstract P264 Figure 1

P265 MAXILLOMANDIBULAR ADVANCEMENT SURGERY IN THE MANAGEMENT OF OBSTRUCTIVE SLEEP APNOEA

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Introduction Obstructive sleep apnoea (OSA) is a clinical condition in which there is intermittent and repeated upper airway collapse during sleep. Maxillomandibular advancement (MMA) has been shown to enlarge the pharyngeal and hypopharyngeal airway by physically expanding the facial skeletal framework. It has also been shown that advancement of the maxillomandibular complex increases tissue tension, and is a valid surgical treatment option for those patients unable or unwilling to tolerate long term continuous positive pressure ventilation (CPAP).

Method We present a series of 10 patients who underwent MMA and genioplasty surgery for OSA, operated by one surgeon, with an average age of 47 years and an average BMI of 27. The minimum advancement of the mandible was 15mm with the maxilla advancing between 12–15 mm. Diagnosis of OSA was based on: clinical history, Epworth Sleepiness Scale (ESS) questionnaire, and formal sleep study parameters via ambulatory sleep study. Lateral cephalometric radiographs were taken pre- and post-operatively to assess widening of the posterior airway space (PAS). The patients were reassessed using the same criteria 6 months post surgery, with annual follow up.

Results All 10 patients reported an improved ESS with the average reduction of 70.3%. The PAS increased by 48.4% (5.11mm), on average, with the biggest increase recorded as 11.8mm. The average apnoea hypopnoea index and oxygen desaturation events decreased by 74% and 69% respectively.

Conclusion The outcome of MMA advancement has previously been reported, with success rates in the literature varying from 57% to 100%. There are no long term studies indicating success. The outcomes of our series of patients support MMA advancement as an effective surgical treatment for OSA and show sustained improvement up to 5 years postoperatively. Careful patient selection and a multidisciplinary approach to management are key to achieving success. Although CPAP remains the standard treatment for most patients with OSA, MMA provides an alternative for

selected OSA patients who cannot use CPAP or who wish a curative treatment without life-long dependency on these devices.

Abstract P265 Table 1 Table comparing Pre- and Post-Operative Ambulatory Sleep Study Results

N=8	Mean Pre-surgery	Range Pre-surgery	Mean Post-surgery	Range Post-surgery	% Difference
AHI (/h)	17.4	9–49.2	4.58	0.4–13.1	74
Oxygen Desats (/h)	11.0	3.7–28.5	3.45	0.1–9.6	69

P266 RESPIRATORY, SLEEPINESS AND METABOLIC MEASURES AND OBSTETRIC OUTCOMES IN OBESE EXPECTANT MOTHERS

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Increasing obesity in the UK population includes expectant mothers.¹ Data from local antenatal clinics (3391 deliveries and 3826 women booked in 2011) show that the number of women with a BMI > 30 (O) and BMI > 50 (SO) are rising particularly in the last 5 years (Fig. 1). We wished to determine the respiratory consequences and maternal outcome for these women.

We examined obese women with a BMI > 50 Kg/m² (SO) who gave birth in 2011 and matched them against non-obese (BMI < 30) women (N) who delivered on the same day. The percentage of SO v N women respectively who gave a history of asthma, diabetes and depression, was 67% v 17%, 50% v 0% and 50% v 17% respectively.

Mean Oxygen saturation in (O and SO) women, supine at rest and awake was 98% and in N 99%. This difference was statistically significant (p = 0.016, unpaired t test, 26 df). Snoring was seen in 67% (O & SO) v 40% N (p = 0.07, χ^2). No difference was seen in the mean Epworth sleepiness scores (ESS; O 6.2 v N 6.6) suggesting ESS is insensitive in these patients. Mean (range) heart rate at rest awake was 84.7 (72–106) bpm in SO and O, v 81.5 (70–99) in N (p = 0.66, unpaired t test)

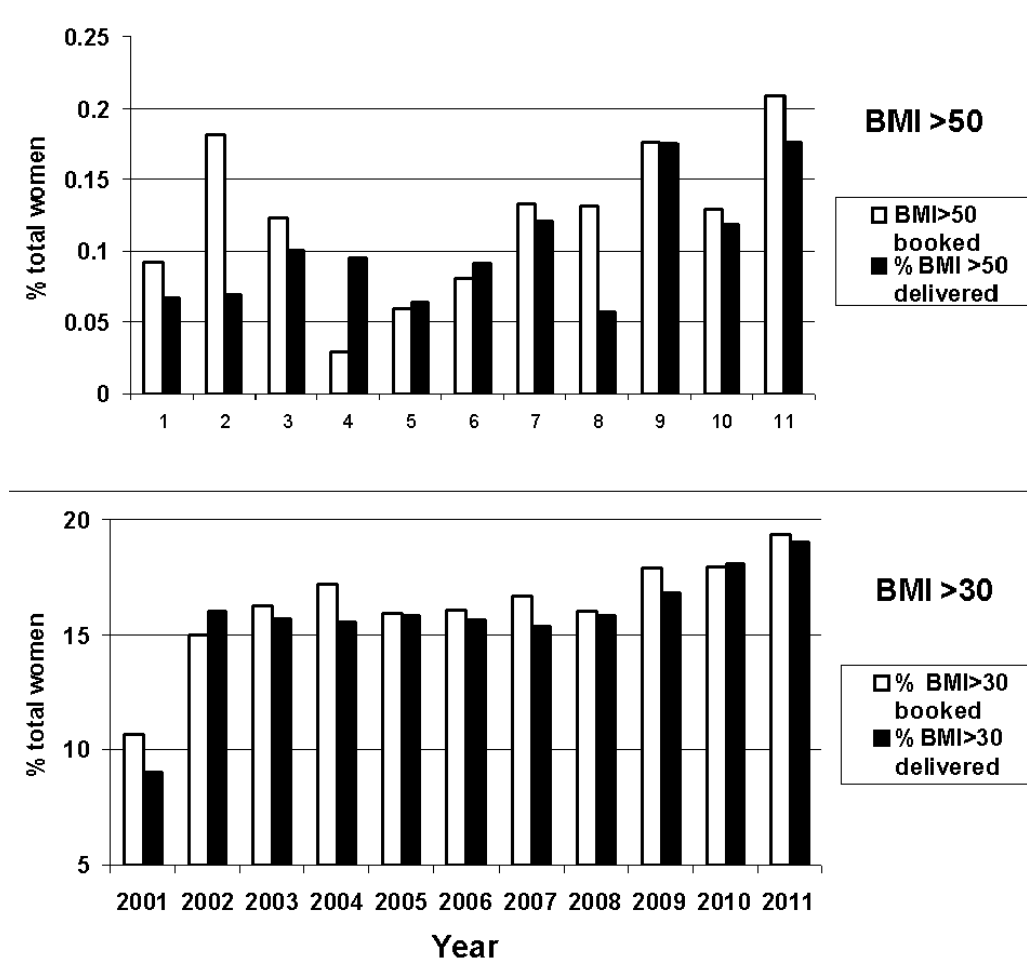
Mean (range) weight gain during pregnancy in N was 10 (1–16) Kg v 6.3 (–5 – 20) Kg in SO and O (p = 0.17, unpaired t test). 100% N but only 67% SO women delivered babies with an acceptable birth weight defined as 2.7–4.0Kg. 37.5% of O and SO women had miscarriages v 8.3% N (p = 0.066, χ^2).

We conclude that obesity, particularly in SO, is associated with an increasing burden on the respiratory and psychological health of expectant mothers, on the outcome of their pregnancies and hospital services.

Reference

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Abstract P266 Figure 1