patients and it is widely used for screening patients. We hypothesised that the use of an online pictorial ESS can promote public awareness and help to screen for patients with undiagnosed sleep disorders.

Methods Between 2011 and 2012, we collected the pictorial ESS data of 24,272 subjects on the official webpage of the British Lung Foundation. Following a short explanation to the questionnaire, eight items are marked and given a score from `0` (not likely todoze) to `3` (very likely to doze) using pictorial items, the range of the total score for the pictorial ESS being `0` to `24`. The cut-off for excessive daytime sleepiness (EDS, more than 10 points) was chosen in line with the traditional ESS. In 3,265 questionnaires the subjects' age and gender were also recorded (starting from 03/2012). Chi-square test was used to compare the proportion of different groups.

Results The total 24,272 subjects scored a mean of 9.3 (5.1) points on the pictorial ESS. Of those, 38.0% were excessively sleepy (14.6 (3.2) points) and 62.0% had normal levels of sleepiness (5.9 (2.7) points, $p<0.001$). In the 3,265 subjects with age and gender recorded, there was no significant difference in the prevalence of excessive daytime sleepiness between genders (42.8% vs 43.9%, $p=0.68$). When age was considered, females tended to be sleepier than males in their 3rd and 4th lifetime decade ($p<0.02$), whilst males scored significantly higher in the 7th decade ($p<0.0001$, Figure); there was a statistically significant trend with age (p-value for trend $p<0.001$)

Conclusion The online pictorial ESS identifies gender differences in EDS on a large scale and reveals more severe levels of sleepiness associated with higher age. The use of modern media facilitates reaching out to the general population to raise awareness of conditions associated with daytime sleepiness such as sleep apnoea.

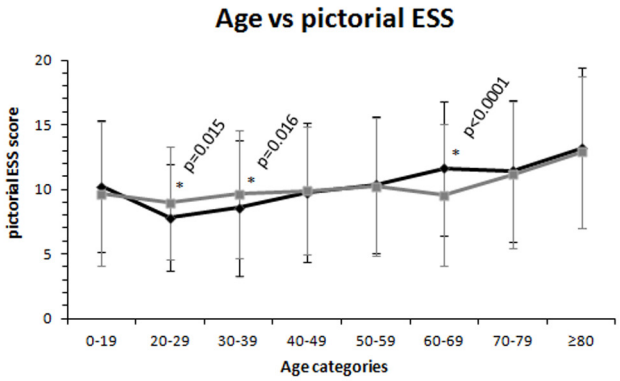

Figure: pictorial ESS for each decade, male vs female. Male: black line, Female: grey line. * shows where statistical significance was observed ($p<0.05$).

Abstract P262 Figure 1

P263 REDUCING INVESTIGATION TIME FOR THE DIAGNOSIS OF THE OBSTRUCTIVE SLEEP APNOEA SYNDROME (OSAS) BY COMBINING OXIMETRY WITH A SCREENING ALGORITHM

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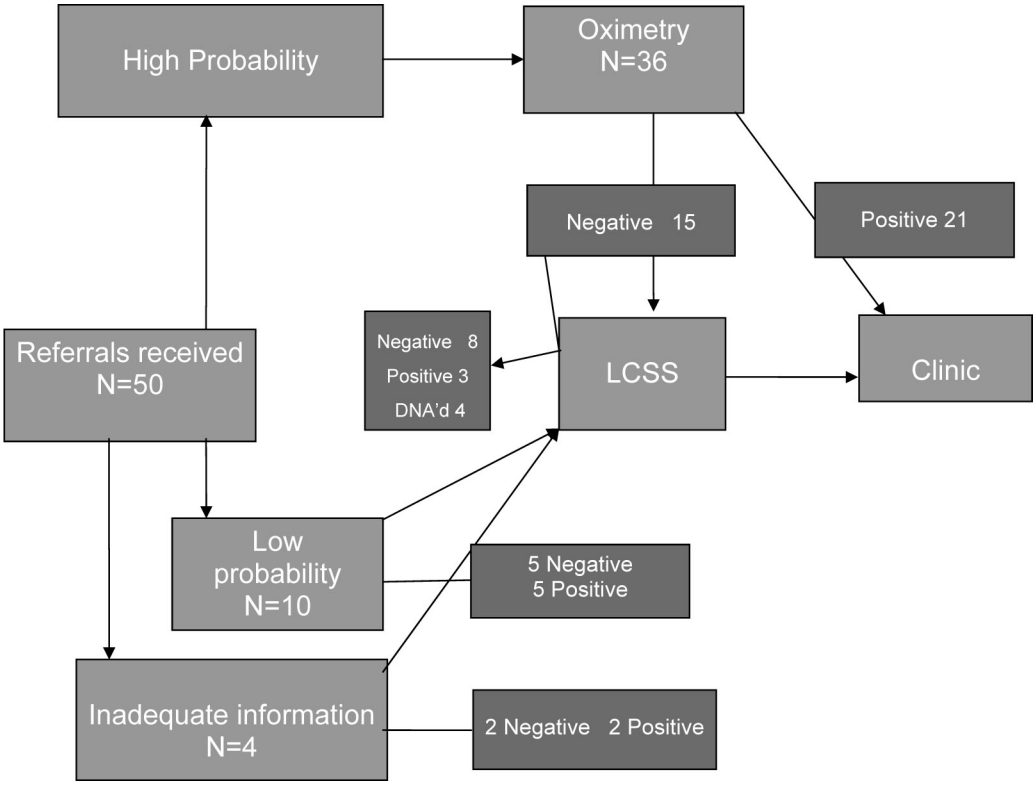
Introduction Oximetry and limited channel sleep studies (LCSS) for the diagnosis of OSAS have sensitivities of 87% and 82–94% respectively and specificities of 65% and 82–100% respectively[1]. Our centre finds oximetry useful for confirming OSAS in high probability patients but not at ruling it out. LCSS seems useful for both. The



Abstract P263 Figure 1 Outcomes of 50 consecutive sleep referrals

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 LCCS. 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 algorithim 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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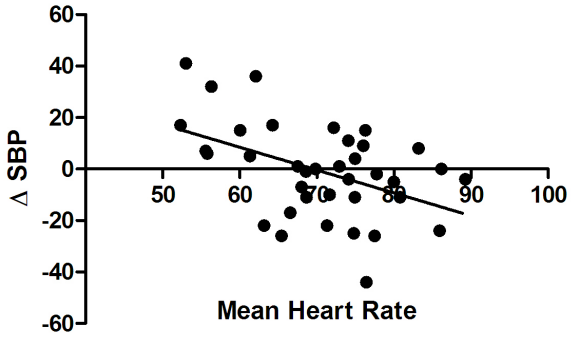
Background Obstructive sleep apnoea (OSA) is the most common sleep disorder and a significant risk factor for cardiovascular disease. In addition, heart rate is an important predictor of hypertension and a risk factor for cardiovascular morbidity and mortality. We hypothesised that changes of nocturnal 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 P 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 SpO_2 ($r=-0.39$, $p<0.01$), mean nocturnal HR vs mean SpO_2 ($r=-0.4$, $p<0.01$) 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 cepalometric 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

Corrections

JA Benjamin. P263: Reducing investigation time for the diagnosis of the obstructive sleep apnoea syndrome (osas) by combining oximetry with a screening algorithm. *Thorax* 2012;67 (Suppl 2):A179. Correct list of authors should be: JA Benjamin, RR Chaube.

Thorax 2013;**68**:162. doi:10.1136/thoraxjnl-2012-202678.355corr1