

Pre-operative assessment for sleep apnoea in patients referred for bariatric surgery : the usefulness of various clinical screening tools

C Martinou¹, UA Nayak¹, GI Varughese¹, A Thomas², M Allen², L Varadhan¹

¹Dept of Diabetes & Endocrinology, ²Dept of Respiratory Medicine
University Hospitals of North Midlands NHS Trust, Stoke on Trent, UK

Introduction

- Obstructive sleep apnoea (OSA) is widely prevalent with obesity; its effect on OSA is multifactorial
- 1 SD increase in BMI increases risk of OSA by 4 fold (Young et al, NEJM 1993)
- The prevalence of OSA correlates well with the BMI; however the severity of OSA does not correlate well to the BMI in severely obese; the risk of severe OSA in these patient is as high as 95% (Serafini et al, Obes surgery 2001)
- There is a significant overlay of OSA with Obesity hypoventilation syndrome (OHS) in this cohort and it is common to assume that managing one could complement the other
- Epworth sleepiness scale (ESS) is a common screening tool for day time sleepiness, a complication of OSA
 - Good at predicting OSA but not predicting its severity (Serafini, Obes Surg 2001)
 - Good positive correlation with AHI index (Yeh, Obes Surg 2010)
- STOP BANG
 - in general practice a cut off of 3 is used; in bariatric practices generally a cut off of 5 is recommended
 - ≥ 5 correlated well with severe to very severe OSA (Chung, BJA 2011)
- Due to the evolving and dynamic nature of the bariatric service and modifications to its framework at our LHE, the guidelines at our hospital included a wide range of different clinical practice with time. This includes a combination of
 - ABG : with triggers of saturation <92% or pO₂ <8 or pCO₂ >6
 - STOP BANG Score
 - Epworth Sleepiness score (ESS) >10
 - Baseline spirometry

Aim

The aim of our retrospective analysis was to assess the utility of various clinical parameters used as screening test for OSA, by estimating their sensitivity against polysomnography-confirmed cases of OSA, in patients referred for bariatric surgery

Methods

- All patients seen in medical bariatric clinic over 12 months included
- Patients on established CPAP were excluded
- Various screening tests based on locally agreed guidelines were carried out on a group of these patients based on clinician's decision including bariatric physicians and surgeons and nurse specialist
- Retrospective observational analysis of standard clinical practice
- Patients with abnormal results were referred for formal sleep studies
 - ABG (based on pCO₂>6, pO₂, Sats on air <92%)
 - STOP BANG score>3
 - ESS>10
 - FEV1/VC <70%

Results

- A total of 227 patients had been seen in the endocrine clinics in 12 months
- Mean BMI 47.6kg/m² (28-82)
- 39 patients had OSA already diagnosed and on OSA therapy
- N=104 were assessed for OSA based on clinical index of suspicion
- 35/104 (34%) did not have OSA on formal sleep studies

Results

- 54% had severe OSA requiring CPAP treatment
- 12% had mild OSA which was conservatively managed
- 34% did not have any sleep apnoea
- There was a small but positive correlation between BMI and presence of OSA (r=0.2) and the severity of OSA (r=+0.15)

Tests	N=	Sensitivity %	Specificity %	PPV %	NPV %
Sats <92%	72	8	86	57	30
pCO ₂ >6	77	20	87	79	30
pO ₂ <8.0	77	11	86	67	28
pO ₂ <10	77	71	55	80	43
STOPBANG ≥3	39	100	7	66	100
STOPBANG ≥5	39	76	50	73	54
ESS >10	74	33	59	31	21
FEV1/VC <70	43	7	77	40	26

Discussion

- The various commonly used history and clinical screening tests have limited sensitivity in diagnosing OSA
- There is always a discussion regarding the need to investigate OSA as this is likely to improve after bariatric surgery
 - OSA is multifactorial and mere weight loss after bariatric surgery may not resolve this (Ashrafian et al, Thorax 2011)
- Establishment of a diagnosis of OSA is important as this has significant anaesthetic implications during peri-operative management
 - Patients with OSA are more sensitive to opioid analgesics and hence risk of respiratory failure
 - Re-establishment on CPAP is vital after bariatric surgery to safely wean the patient off the ventilator during surgery
- OSA takes longer to resolve after bariatric surgery – it is therefore vital that post-operative follow up is also arranged for these patients (Sjostrom et al, NEJM 2007)
- OSA related disordered breathing and related hypoxemia may have impacts on wound healing and long term cardiovascular health
- Limitations of our analysis**
 - Not all patients referred to the clinic were assessed – some patients were deemed not to have OSA clinically
 - Many of the guidelines reported were based on local surgical and anaesthetics and hence not validated

Conclusion

- A significant proportion of patients have OSA
- Universal screening of all patients referred to bariatric services should be recommended, due to its wide prevalence and associated cardiovascular and respiratory morbidity
- It is important to appreciate that the various routinely used clinical screening tools only assess components of OSA and has limitations, thereby affecting their sensitivity and specificity
- Formal sleep oximetry studies are required, due to significant implications on anaesthetic and peri-operative management