

# Obstructive Sleep Apnoea and Bariatric Surgery: the need for more universal screening and post-operative follow up

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## Introduction

- Obesity is associated with significant increased risk of obstructive sleep apnoea (OSA). Bariatric surgery can potentially reduce the BMI which can help to resolve OSA
- 10% increase in body weight increases risk of OSA x6 fold and worsen apnoea hypopnoea index (AHI) by 32% over 4 yrs. (Young et al, NEJM 1993)
- A 10% weight loss can reduce AHI by 26%
- Meta-analysis shows that >80% would have improvement in OSA (Buchwald, JAMA 2004)
- Varying reports in literature regarding outcomes of OSA after weight loss
  - Resolution of OSA can sometimes be as quick as within the first month after bariatric surgery (Varela et al, Obes surgery 2007)
  - However OSA can still persist and require treatment 1 year after bariatric surgery
  - Apnoea/ hypopnoea index reduces with bariatric surgery but may not account for complete resolution
  - RCT comparing bariatric surgery vs conventional treatment showing some reduction but no significant improvement in OSA (Dixon et al, JAMA 2012)
- The improvement of OSA is multifactorial – due to weight loss, reduced insulin resistance, change in sex hormone levels, reduced cytokines and gut hormone profile (Ashrafian et al, Thorax 2011)

## Aim

The aim of our retrospective analysis was to assess the prevalence of obstructive sleep apnoea in patients referred for bariatric surgery and to evaluate the persistence or resolution of OSA after bariatric surgery

## Methods

- Retrospective data analysis
- Patients were referred for OSA assessment based on clinical index of suspicion
- Overnight oximetry was used to screen for OSA and polysomnography used as confirmatory test (done by respiratory department)
- Retrospective analysis from clinic letters and hospital computerized biochemistry system
- Patients who had laparoscopic gastric bypass surgery or sleeve gastrectomy and completed at least 6 months of follow up were included

## Results

- Records of 230 patients analysed
- Mean age 45 years (20-69)
- Mean BMI: 48.5kg/m<sup>2</sup> (35-83)
- Mean weight : 136kg (85-250)
- 31% were men
- Baseline data
  - 13.5% had pre-established OSA on CPAP
  - 21.7% did not have OSA ( based on clinical suspicion and/or ruled out after screening test
  - Patients with no clinical data on OSA were excluded (n=86)

## Results

- 27.4% (N=63) referred for OSA assessment with high index of clinical suspicion of OSA
  - No OSA or mild OSA which did not need treatment: 57% (n=36)
  - Moderate OSA: 8% (n=5)
  - Severe or very severe OSA: 35% (n=22)
- The BMI of patients with OSA was significantly higher than those without OSA (52.0 vs 46.3, p=0.014)
- Post Operative follow up
  - Mean follow up data after 236 days
  - N=58 (pre-established + new diagnosis of moderate and severe OSA)
  - Data available on 40 patients
  - Mean BMI at follow up : 27.9kg/m<sup>2</sup> (25-66)
    - 15/40 had resolution of OSA and hence CPAP withdrawn
    - 22/40 had improvement in OSA but still had to continue on CPAP
    - 3/40 non-compliant and hence CPAP withdrawn
  - Comparing persistent OSA vs resolved OSA
    - Pre op BMI (52.0 vs 49.6kg/m<sup>2</sup>, p=NS)
    - Latest BMI (38.5 vs 35.7kg/m<sup>2</sup>, p=NS)
    - Weight loss achieved (44.0 vs 40.5kg, p=NS)

## Discussion

- The prevalence rates of OSA in patients referred for bariatric surgery is high – in our study 40% among those we have data on.
- Obesity is one of the easiest identifiable risk factor for screening for OSA- our study demonstrates correlation with higher BMI
- Nocturnal home oximetry remains a good screening test though formal polysomnography is required for confirming the diagnosis
- Routine clinical history or preliminary screening tests such as STOP BANG or Epworth Sleepiness score may not be entirely reliable on their own
- A significant proportion of patients with OSA continue to require CPAP therapy despite good weight loss after surgery – OSA is multifactorial and reducing weight alone may not resolve it
- The improvement in OSA after surgery is not only related to weight loss but various other changes in the hormone profile
  - On weighted analysis, a simple BMI reduction of 3.2 kg/m<sup>2</sup> would reduce AHI by 13/h, adjusted for all other factors (Ashrafian, Thorax, 2011)
- The magnitude of weight loss reduction did not have any correlation to resolution of OSA in our study
- RCT comparing bariatric surgery vs standard weight loss treatment showed a 27 vs 5kg weight loss, AHI reduction of 25.5 vs 14/h; despite this there was no statistical difference achieved between the two groups at 2 years (Dixon et al, JAMA 2012)
- Prolonged duration of CPAP treatment is required for correction of various components of OSA – upper airway resistance syndrome, OSA per se, Sleep associated disordered breathing – all of these may not be corrected in a short duration with weight loss alone

## Conclusion

- A significant proportion of patients continue to have OSA requiring CPAP therapy despite good weight loss
- Screening for OSA should be universally recommended in bariatric pathways to identify this common associated morbidity
- CPAP treatment should not be discontinued post-operatively and periodic follow up should be arranged with the respiratory team to reassess the CPAP requirement and withdrawal of treatment when appropriate