

SHORT COMMUNICATION

The prevalence of obstructive sleep apnea characteristics in patients with Barrett's esophagus

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ABSTRACT

An increasing number of patients with Barrett's esophagus present for diagnostic and/or therapeutic upper GI endoscopy. It has been our impression that a large number of these patients have history and characteristics strongly suggestive of obstructive sleep apnea (OSA), and are, therefore, more challenging to sedate during the upper GI endoscopic procedures. This study was conducted to prospectively quantify the prevalence of OSA characteristics in patients with Barrett's esophagus. Consented patients with Barrett's esophagus were prospectively screened for obstructive sleep apnea (OSA) risk using the modified neck circumference questionnaire. The study demonstrated a statistically significant association between Barrett's esophagus and high OSA risk when compared to the general GI endoscopy population.

Key words: Barrett's esophagus; Obstructive sleep apnea.

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INTRODUCTION

Patients with obstructive sleep apnea (OSA) are at increased risk of sedation-related morbidity and mortality. The risk increases in proportion to the severity of the OSA because of the potential difficulty in maintaining a patent airway.¹ An increasing number of patients with Barrett's esophagus present for diagnostic and/or therapeutic upper GI endoscopy such as radiofrequency ablation (Barrx procedure).² It has been our impression that a large number of these patients have history and characteristics strongly suggestive of OSA, such as snoring, large neck circumference, hypertension, and choking during sleep. They are, therefore, more challenging to sedate during the upper GI endoscopic procedures. This is particularly the case during the Barrx procedure which is longer than a diagnostic upper GI endoscopy and requires multiple insertions of the endoscope. Since the exact incidence of OSA in this patient population has not been determined, we conducted this study to prospectively quantify the prevalence of OSA characteristics in patients with Barrett's esophagus.

METHODOLOGY

With IRB approval and written informed consent, outpatients presenting for GI endoscopy over a consecutive 4-week period, who had a confirmed diagnosis of Barrett's esophagus, were screened for OSA risk, using the modified neck circumference questionnaire routinely used for preoperative OSA screening at our hospital.³ The questionnaire asks the patient about history of snoring, hypertension, and nighttime choking. The patient's neck circumference is measured in cm and the measurement is then modified according to the response to the questionnaire, adding 4 points for a positive history of hypertension and 3 points each to a positive history of snoring and nighttime choking. Patients with modified neck circumference score greater than 48 are considered at high risk for having severe OSA. (Box 1)

Box 1: Modified Neck Circumference Questionnaire.³

- 1) Neck circumference in cm.
- 2) History of snoring: add 3 points.
- 3) Hypertension: add 4 points.
- 4) Nighttime choking: add 3 points.

Total items 1-4.
A score ≥ 48 indicates a high probability of OSA.

obstructive sleep apnea with Barrett's esophagus

For comparison, all outpatients presenting for GI endoscopy on two consecutive days were similarly screened for OSA risk. Whether to use the data for a pilot or a definitive study was to be determined following statistical analysis of the data and determination of the significance of the difference between the two groups.

RESULTS

Twenty five patients with confirmed diagnosis of Barrett's esophagus were screened. Twelve out of the 25 patients (48%) had modified neck circumference score greater than 48 indicating high probability of OSA. Forty six patients were screened in the control group. Seven out of the 46 patients (15%) had a score greater than 48. The data, compared using Fisher's exact test, showed a statistically significant association between Barrett's esophagus and high OSA risk when compared to the general GI endoscopy population ($P = 0.0047$). Furthermore, the data demonstrated that patients with Barrett's esophagus were 5.14 times more likely to possess OSA characteristics (95% confidence interval: 1.67-15.82) than patients without the condition. The strength of the statistical significance between the two groups justify using the results as definitive data.

DISCUSSION

This study confirmed the high prevalence of OSA characteristics in patients with confirmed diagnosis of Barrett's esophagus compared to the general GI endoscopy population. Barrett's esophagus is defined as intestinal metaplasia of the esophageal epithelium which affects patients with gastroesophageal reflux disease (GERD).² Obesity is a key risk factor to both OSA and GERD.⁴ Kahrilas raised the question of whether OSA and GERD commonly coexisted because of shared risk factors or because a causal relationship existed between them.⁵ He reviewed different studies on the topic and concluded that the most compelling argument is that people with OSA are more likely to be obese and more likely to have hiatus hernia, and that it was the hernia that predisposed obese people to nocturnal reflux with

prolonged esophageal acid exposure. This explains why patients with Barrett's esophagus have a higher incidence of OSA than the general population.

The high prevalence of OSA characteristics in patients with Barrett's esophagus warrants careful screening of these patients for OSA risk and consideration of different airway protection options when sedating them for upper GI endoscopy particularly during long therapeutic procedures. While propofol, when available, usually provides effective and safe anesthesia for upper GI endoscopy in most patient, consideration of alternative anesthesia techniques such as light sedation, topical airway anesthesia, dexmedetomidine supplementation and/or elective endotracheal intubation may be needed in patients with Barrett's esophagus who have the difficult airway characteristics associated with OSA.

Limitations: Our study has the limitation that although it indicates an interesting correlation between Barrett's esophagus and GERD, there may not be a true association rather one that occurs because both conditions (Barrett's and OSA) are associated with other factors including obesity. In order to rule this out, a multivariate analysis needs to be performed comparing the demographic and clinical findings between the two groups. For example, is there a weight difference between the two populations studied (Barrett's and non-Barrett's)? We feel that a larger sample size with complex statistical analysis may confirm the findings or otherwise.

CONCLUSION

This study demonstrated a statistically significant association between Barrett's esophagus and high OSA risk when compared to the general GI endoscopy population. Awareness of this finding is important when screening patients with Barrett's esophagus and when considering different airway management options during their sedation for upper GI endoscopy.

Conflicts of Interest: The authors have no personal or financial conflicts of interest.

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