Evaluation of Epworth Sleepiness Scale to Predict Obstructive Sleep Apnea in Morbidly Obese Patients and Increasing Its Utility

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Abstract

Introduction: Studies have shown that Epworth sleepiness scale (ESS) is not a good tool to predict obstructive sleep apnea (OSA). However, data regarding the accuracy of ESS in the prediction of OSA among morbidly obese patients are scarce.

Methods: The study involved a retrospective review of the charts of the consecutive patients who underwent bariatric surgery at a tertiary care teaching hospital. All the patients underwent polysomnography (PSG) and undertook the ESS questionnaire. The sensitivity and specificity of ESS were calculated based on its correlation with the PSG findings. Furthermore, a new score was devised to improve the utility of ESS to predict OSA.

Results: A total of 232 consecutive patients from January 2014 to July 2017 were included in the study. The mean age and body mass index (BMI) were 40.5 ± 11.8 years and $47.6 \pm 7.3 \, kg/m^2$, respectively. Among the 162 patients who had an ESS <10, 57.4% had moderate-to-severe OSA. The sensitivity of ESS to predict moderate-to-severe OSA was found to be 38.8% and the positive predictive value was 84.2% (positive likelihood ratio 2.82, 95% confidence interval = 1.57–5.06). A predictive score was identified as 0.031Age (years) +0.039BMI (kg/m^2) + 0.038ESS + Gender (1 for male, 0 for female). The score had a sensitivity of 80% at a cutoff of 3.3.

Conclusions: Among the morbidly obese, ESS is a poor predictor of OSA. Its utility as a tool for prediction of moderate-to-severe OSA can be improved by use of a new formula incorporating age, gender, and BMI beside ESS.

Keywords: Epworth sleepiness scale, obstructive sleep apnea, morbidly obese, bariatric surgery

Introduction

PREVALENCE OF OBSTRUCTIVE sleep apnea (OSA) has been found to be >70% in various studies among morbidly obese patients.[1,2] OSA is associated with excessive daytime sleepiness (EDS), morning headache, fatigue, inattention, depression, errors in judgment, and impaired quality of life. OSA is a known cardiovascular risk factor and thus the patients suffering from OSA are at risk when they undergo any invasive intervention.[3] Furthermore, patients planned for bariatric surgery need to be evaluated for the presence of OSA preoperative optimization with continuous airway positive pressure to avoid complications such as postoperative desaturation, cardiac events, and acute respiratory failure.[4,5] Polysomnography (PSG) has been the gold standard technique to predict OSA, although it is costly and tedious to perform. Other tools are needed to predict OSA that are technically easier to perform. Epworth sleepiness scale (ESS)

was devised to predict EDS, but it has often been used to predict OSA. In general population, studies have shown that ESS is not a good tool to predict OSA.[6–8] However, data regarding the accuracy of ESS in morbidly obese patients are lacking, with only a few studies addressing this issue.[9–12] We aim to study the utility of ESS for predicting OSA in morbidly obese patients. We also suggest a new formula to improve its utility.

Materials and Methods

The study involved the retrospective review of the charts of all the consecutive patients who underwent bariatric surgery at a tertiary care teaching hospital. All the patients underwent PSG as a part of the preoperative evaluation for bariatric surgery and undertook the ESS questionnaire. ESS is a questionnaire to assess the tendency to fall asleep during eight daily activities and the score ranges from 0 to 24.[13] (The

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