Commentary for Critical Care and Shock

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Re: Berlin Questionnaire and Portable Monitoring Device for Diagnosing Obstructive Sleep Apnea: A Preliminary Study in Jakarta, Indonesia

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Obstructive sleep apnea is the most common form of sleep-disordered breathing, affecting a significant population world-wide. Descriptions of sleep-disordered breathing date back to 200 years. Obstructive sleep apnea (OSA) has been associated with an increased risk of cardiovascular disease, stroke, pulmonary and systemic hypertension, and increased risk of automobile accidents, insulin resistance and arrhythmia.

Classic suspicion of obstructive sleep apnea is usually raised by complaints of snoring or daytime fatigue despite adequate duration of sleep. Indeed many patients are asymptomatic and present with atypical presentation to their physicians with hypertension, arrhythmia, or congestive heart failure.

Obstructive sleep apnea affects 24% of middle aged men and 9% of women in the United States [1]. Sleep apnea and milder forms of sleep-disordered breathing are associated with acute and substantial cardiovascular stress. Respiratory events during sleep often cause hypoxemia, sympathetic activation, acute pulmonary and systemic hypertension, and decreased stroke volume [2-5]. Several recent studies have provided important information regarding the prevalence of sleep-disordered breathing in patients with congestive heart failure. Morbidity is significantly increased in sleep-disordered breathing patients, and can be improved by effective therapy [6-9].

The Berlin Questionnaire was an outcome of the Conference on Sleep in Primary Care held in Germany in 1996. The attendees, by consensus, developed an instrument that focused on a limited set of known risk factors for sleep apnea. Since then the Berlin Questionnaire has been used in several studies. It was first reported to have been used by Netzer [10] to identify patients at risk for sleep apnea syndrome. It has also been used by Moreno [11] in identifying high-risk patients with obstructive sleep apnea in truck drivers. Several studies have used the Berlin Questionnaire as a screening tool. The Berlin Questionnaire has been tested in primary care settings and was able to identify high-risk patients fairly accurately. A regression neural network performed well with a sensitivity of 99%, a specificity of 80%, and a positive predictive value of 98% [12].

The current study by Rasmin [13] addressed the issue of OSA in Indonesian populations. The author studied the efficacy of the already established Berlin Questionnaire as a screening method. The author also used the portable monitoring device to look for the presence of OSA in those patients. Significant correlation was found between the Berlin Questionnaire and the Apnea Hypopnea Index (AHI). This is also consistent with the study done by us where we found 91.7% of patients who responded positively to the Berlin Questionnaire also had significant OSA, with apnea hypopnea indices greater than fifteen by ApneaLink [14]. The ApneaLink is a single channel sleep screening device that measures airflow with a special nasal cannula and integral pressure sensor. It derives and automatically analyzes apnea, hypopnea, flow limitation, and snoring. The ApneaLink generated flow-time curves correspond with pneumotachograph-generated curves in 95% of respiratory events. In one study, sensitivities and specificities for sleep-disordered breathing were 97.3% and 46% respectively at sleep-disordered breathing defining apnea/hypopnea index score of 5, and 100% and 87.5% at sleep-disordered breathing defining apnea/hypopnea index of 10. The key features are that it is easy to use, has a low cost-per use (<8 dollars), and provides reliable, objective results.

The ApneaLink, originally known as microMesam, was cleared by the FDA with the following indication for use. "microMESAM® Basic-Set is used for recording the patient's respiratory nasal pressure during sleep. The device is intended for use as a screening device to determine the need for clinical diagnosis and evaluation by polysomnography based on the patient's test score [15]."

In my opinion, the use of the Berlin Questionnaire is a cost effective method for screening, although for the final diagnosis, overnight polysomnographic study still remains the gold standard. Other alternative portable devices such as ApneaLink can play a role in addition to the Berlin Questionnaire in situations where overnight polysomnographic study cannot be performed.

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