Original Research Article

Characteristics of patients with rapid eye movement-related obstructive sleep apnea: a retrospective review of 52 patients at a tertiary care center

Muhammad Hawari1*, Mohamad Gayath Jamil1, Sanaa Hemideh1, Ayman Alharbi1,2

1Department of Medicine, King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia
2Department of Medicine, College of Medicine, Qassim University, Buraidah, Kingdom of Saudi Arabia

Received: 16 March 2020
Revised: 06 November 2020
Accepted: 07 July 2020

*Correspondence:
Dr. Muhammad Hawari,
E-mail: mhawari@kfshrc.edu.sa

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: The term “rapid eye movement (REM)-related obstructive sleep apnea (OSA)” is commonly used to describe sleep disordered breathing that occurs exclusively in REM sleep. The prevalence of REM-related OSA ranges from 10% to 36%. Despite the presence of reports describing the features of REM-related OSA, there is still much more to be known about it.

Methods: In this study we did retrospective review of 734 patients who had a diagnostic sleep study in a sleep lab at a tertiary center between January 2014 and August 2016 were reviewed.

Results: We found that hypertension was found in the charts of 50 patients, 36 of them were diagnosed with hypertension and on medical therapy (72%), 11 patients (out of 50) had diabetes (22%) and 9 (out of 49) had dyslipidemia. 2 patients (out of 49) had ischemic heart disease (4%), 1 patient (out of 49) had stroke (2%) and 3 patients (out of 49) had arrhythmia (6%). 8 patients (out of 49) had thyroid disease (16%).

Conclusions: In conclusion Most patients had mild REM related OSA and most did not have subjective EDS. Hypertension was the most common comorbidity among our patients.

Keywords: REM-related OSA, Retrospective review, Comorbidity

INTRODUCTION

Obstructive sleep apnea (OSA) is a sleep-related breathing disorder characterized by full or partial occlusion of the upper airway during sleep.1 An obstructive apnea is a 10-second pause in respiration associated with ongoing ventilatory effort. Obstructive hypopneas are decreases in, but not complete cessation of, ventilation. There is associated with fall in oxygen saturation or arousal. A diagnosis of OSA syndrome is accepted when a patient has an apnea-hypopnea index (AHI; number of apneas and hypopneas per hour of sleep) more than 5 per hour and clinical symptoms suggestive of OSA such as excessive daytime sleepiness.2,3

Although upper airway collapse can occur in rapid eye movement (REM) and non-REM (NREM) sleep, the withdrawal of excitatory noradrenergic and serotonergic inputs to upper airway motor neurons during REM sleep further reduces pharyngeal muscle activity and substantially increases the propensity for upper airway collapse.4,5 OSA generally tends to worsen during REM sleep as it increases in frequency with worsening in oxygen desaturations. The term “REM-related OSA” is commonly used to describe disordered sleep breathing that occurs...
affected (54%) than women (46%). The prevalence of REM-related OSA ranges from 10% to 36%.\textsuperscript{10,14} Despite the presence of reports describing the features of REM-related OSA, few details are known about its features.\textsuperscript{10,14}

**Objectives**

The aim of this study is to explore the characteristics of patients with REM-related OSA in our sleep lab. We looked at the prevalence of REM-related OSA among patients who had a diagnostic sleep study in our sleep lab, including their mean age, severity, gender prevalence, subjective excessive daytime sleepiness (EDS), and clinical comorbidities.

**METHODS**

**Study design**

This was a Single-centered retrospective cohort study. Retrospective review of the charts of 734 patients who had a diagnostic sleep study in a sleep lab at a tertiary center between January 2014 and August 2016. All studies were in the diagnostic sleep lab (level 1). The inclusion criteria an age of more than 12, total AHI <5/h, and a REM AHI >5/h. Therapeutic studies, split studies, patients younger than 12 years, patients with normal both total and REM AHI, patients with a high central apnea index (CAI >5/h), and those with other sleep-related breathing disorders were excluded.

**RESULTS**

Of the 734 diagnostic sleep studies conducted between January 2014 and August 2016, we identified 52 patients (7%) who met our inclusion criteria and identified as REM-related OSA. The mean age was 41. Men were slightly more affected (54%) than women (46%). The REM sleep disordered breathing was mild (5-15/h) in 34 patients (65%), moderate (15-30/h) in 14 patients (26%), and severe (>30/h) in 4 patients (8%). The mean REM apnea hypopnea index (AHI) was 16.3/h. The Epworth sleeping scale (ESS) was obtained from 48 patients, and the mean score was 9.5/24, indicating no subjective excessive daytime sleepiness (EDS) among this population. Information about hypertension was found in the charts of 50 patients: 36 of them were diagnosed with hypertension and on medical therapy (72%). 11 patients (out of 50) had diabetes (22%), and 9 (out of 49) had dyslipidemia. 2 patients (out of 49) had ischemic heart disease (4%), 1 patient (out of 49) had stroke (2%), and 3 patients (out of 49) had arrhythmias (6%), and 8 patients (out of 49) had thyroid disease (16%).

**DISCUSSION**

The previous evidence suggesting that the prevalence of REM-related OSA ranges from 10% to 36%.\textsuperscript{4,9} This was a retrospective study in a sleep lab in a tertiary center. Only a small percentage of patients met our inclusion criteria suggesting that REM-related OSA is rare at in our population. Most of patients had mild disease with little subjective excessive daytime sleepiness according to Epworth sleeping scale. Hypertension was the most common comorbidity in our population perhaps because hypertension is a complication or a risk factor of REM-related OSA.

**CONCLUSION**

REM-related OSA was rare in our population. Most patients had mild REM-related OSA and most did not have subjective EDS. Hypertension was the most common comorbidity.

**Funding:** No funding sources  
**Conflict of interest:** None declared  
**Ethical approval:** The study was approved by the Institutional Ethics Committee

**REFERENCES**

1. Kushida CA, Chediak A, Berry RB, Brown LK, Gozal D, Iber C et al. Clinical Guidelines for the Manual Titration of Positive Airway Pressure in Patients with Obstructive Sleep Apnea, Positive Airway Pressure Titration Task Force of the American Academy of Sleep Medicine. Journal of Clinical Sleep Medicine. 2008;4(2):2008.
2. Sleep-related breathing disorders in adults: recommendations for syndrome definition and measurement techniques in clinical research. The Report of an American Academy of Sleep Medicine Task Force. Sleep. 1999;22:667-89. Accessed on 02 February 2020.
3. Somers VK, White DP, Amin R, Abraham WT, Costa F, Culebras A et al. Sleep Apnea and Cardiovascular Disease, An American Heart Association/American College of Cardiology Foundation Scientific Statement from the American Heart Association Council for High Blood Pressure Research Professional Education Committee, Council on Clinical Cardiology, Stroke Council, and Council on Cardiovascular Nursing. J Am Coll Cardiol. 2008;52:686-717.
4. Mokhlesi B, Punjabi NM. REM-related Obstructive Sleep Apnea: An Epiphenomenon or a Clinically Important Entity? SLEEP.2012;35(1):2012.
5. Fenik VB, Davies RO, Kubin L. REM sleep-like atonia of hypoglossal (XII) motoneurons is caused by loss of noradrenergic. 2005;172(10):1322-30.
6. Haba-Rubio J, Janssens JP, Rochat T, Sforza E. Rapid eye movement related disordered breathing: clinical and polysomnographic features. Chest. 2005;128:3350-7.
7. Resta O, Carpanano GE, Lacedonia D. Gender difference in sleep profile of severely obese patients with obstructive sleep apnea (OSA). Respir Med. 2005;99:91-6.
8. Koo BB, Dostal J, Ioachimescu O, Budur K. The effects of gender and age on REM-related sleep-disordered breathing. Sleep Breath. 2008;12:259-64.
9. Koo BB, Patel SR, Strohl K, Hoffstein V. Rapid eye movement-related sleep-disordered breathing: influence of age and gender. Chest. 2008;134:1156-61.
10. O’Connor C, Thornley KS, Hanly PJ. Gender differences in the polysomnographic features of obstructive sleep apnea. Am J Respir Crit Care Med. 2000;161:1465-72.
11. Goh DY, Galster P, Marcus CL. Sleep architecture and respiratory disturbances in children with obstructive sleep apnea. Am J Respir Crit Care Med. 2000;162:682-6.
12. Chami HA, Baldwin CM, Silverman A. Sleepiness, quality of life, and sleep maintenance in REM versus non-REM sleep-disordered breathing. Am J Respir Crit Care Med. 2010;181:997-1002.
13. Chervin RD, Aldrich MS. The relation between multiple sleep latency test findings and the frequency of apneic events in REM and non-REM sleep. Chest. 1998;113:980-4.
14. Findley LJ, Wilhoit SC, Suratt PM. Apnea duration and hypoxemia during REM sleep in patients with obstructive sleep apnea. Chest. 1985;87:432-6.

Cite this article as: Hawari M, Jamil MG, Hemideh S, Alharbi A. Characteristics of patients with rapid eye movement-related obstructive sleep apnea: a retrospective review of 52 patients at a tertiary care center. Int J Adv Med 2021;8:42-4.