



Original Investigation

Comorbidity of sleep apnoea syndrome in patients with fibromyalgia in a sleep clinic[☆]



Renny Jaimes Beltrán^{a,*}, Javier Ramírez Figueroa^b, Natalia Andrea Skupin Rueda^c

^a Clínica Neumológica y del Sueño, Cúcuta, Colombia

^b Bioreuma, Cúcuta, Colombia

^c General Medicine, Clínica Neumológica y del Sueño, Cúcuta, Colombia

ARTICLE INFO

Article history:

Received 18 December 2020

Accepted 24 February 2021

Available online 30 May 2022

Keywords:

Fibromyalgia

Sleep apnoea syndromes

Sleep obstructive apnoea

Sleep

Rheumatology

ABSTRACT

Introduction: Fibromyalgia syndrome (FMS) is characterized by chronic musculoskeletal pain, fatigue, and the sense of waking unrefreshed. Obstructive sleep apnoea syndrome (OSAS) and FMS have symptoms in common and the association of OSAS in these patients could confuse the diagnosis and worsen the severity and prognosis of FMS. The objective of this study was to establish the presence of OSAS in patients with FMS and sleep complaints in a sleep clinic.

Methods: A cross-sectional study was conducted in patients aged 18 and above with FMS who were referred by rheumatology to a sleep clinic to confirm OSAS with polysomnography from 2015 to 2018. Descriptive statistics tools were applied.

Results: Polysomnographic investigations were performed in 51 patients with FMS. OSAS was detected in 82% of patients. The mean age was 65 years. Of the patients studied, 82% were women and 78% of them had OSAS. All the male patients with FM had OSAS. Of the patients, 27.5% were normal weight and 45% were overweight. Of the patients, 23% had severe OSAS, 31% moderate and 45% mild.

Conclusion: We found a high frequency of OSAS in this group of FMS patients. Since the 2 diseases share symptoms, it is interesting to delve deeper into the investigation of common pathophysiological mechanisms. The coexistence of the 2 pathologies poses diagnostic and therapeutic challenges that implies the need for further study at local level.

© 2021 Asociación Colombiana de Reumatología. Published by Elsevier España, S.L.U. All rights reserved.

PII of original article: S0121-8123(21)00053-0

[☆] Please cite this article as: Jaimes Beltrán R, Ramírez Figueroa J, Skupin Rueda NA. Comorbilidad de síndrome de apnea del sueño en pacientes con fibromialgia en una clínica de sueño. Rev Colomb Reumatol. 2022;29:177–181.

* Corresponding author.

E-mail address: directormedico@clinicaneumologica.co (R. Jaimes Beltrán).

2444-4405/© 2021 Asociación Colombiana de Reumatología. Published by Elsevier España, S.L.U. All rights reserved.

Comorbilidad de síndrome de apnea del sueño en pacientes con fibromialgia en una clínica de sueño

R E S U M E N

Palabras clave:

Fibromialgia

Síndromes de la apnea del sueño

Apnea obstructiva del sueño

Sueño

Reumatología

Introducción: La fibromialgia (FM) se caracteriza por dolor crónico, cansancio y sueño no reparador. El síndrome de apnea hipopnea obstructiva del sueño (SAHOS) tiene síntomas en común con la FM y su presencia puede confundir el diagnóstico y empeorar la gravedad y el pronóstico de la FM. El objetivo de este estudio fue establecer la presencia de SAHOS en pacientes con FM y alteraciones del sueño en una clínica de sueño.

Métodos: Estudio observacional, de corte transversal, en pacientes mayores de 18 años con FM remitidos por Reumatología a una clínica de sueño para confirmar SAHOS por medio de polisomnografía, entre el 2015 y el 2018. Se aplicaron herramientas de estadística descriptiva.

Resultados: Se realizó polisomnografía completa a 51 pacientes con FM y se confirmó SAHOS en el 82%. La edad media fue de 65 años. El 82% de los pacientes estudiados fueron mujeres y, de estas, el 78% tuvo SAHOS. Al 100% de los hombres con FM se les diagnosticó SAHOS. El 27,5% tuvo un peso normal y el 45% sobrepeso. El 23% de los pacientes tuvo SAHOS grave, el 31% moderado y el 45% leve.

Conclusiones: Encontramos una alta frecuencia de SAHOS en este grupo de pacientes con FM. Las 2 enfermedades comparten síntomas, por lo que es interesante profundizar más en la investigación de mecanismos fisiopatológicos comunes. La coexistencia de las 2 patologías plantea retos diagnósticos y terapéuticos que vislumbran la necesidad de estudios más profundos a escala local.

© 2021 Asociación Colombiana de Reumatología. Publicado por Elsevier España, S.L.U.

Todos los derechos reservados.

Introduction

Fibromyalgia (FM) is a disease characterized by chronic diffuse musculoskeletal pain of non-articular origin, associated with unrefreshing sleep and fatigue. The proposed pathophysiological mechanism is based on central sensitization, sleep deficit, psychosocial stress, physical trauma, and genetic and endocrine factors.¹⁻³

The worldwide prevalence of FM is 2-8% and women are most commonly affected.⁴ In Colombia, the estimated prevalence is 0.72%, with equal predominance in the female gender.⁵

The diagnosis of FM is clinical and, as there is no confirmatory test, is based on the symptoms reported by the patients and on the exclusion of other diseases.^{6,7}

In 2011, the American College of Rheumatology recommended that, in addition to evaluating pain as the main symptom, other types of symptoms, such as those related to sleep, fatigue, cognitive difficulties and other somatic symptoms, should be studied in greater depth to establish the diagnosis of FM.^{8,9}

In the general population, the most frequent sleep disorders are insomnia and obstructive sleep apnea hypopnea syndrome (OSAHS). In patients who suffer from FM and OSAHS at the same time, unrefreshing sleep and generalized pain are common. İnönü et al. evidenced a prevalence of OSAHS of 50% (n = 12) in patients with FM and sleep disturbances.¹⁰

Some authors associate insomnia and OSAHS with chronic widespread pain and propose sleep deprivation and apnea as causes of pain syndromes in patients with rheumatic disease.¹¹⁻¹⁴ Indeed, in relation to the treatment of both diseases, Marvisi et al. studied the effect of CPAP on the mitigation of FM symptoms in patients with FM and OSAHS.¹⁵

One hypothesis that may explain the relationship between sleep apnea and FM is the alteration of sleep slow waves. The reduction of sleep slow waves is associated with worsening of pain and increased central sensitization to both painful and non-painful stimuli. In OSAHS, these waves are altered, which could be one of the pathophysiological keys to link this syndrome with the increase in generalized pain typical of FM.¹⁶

No studies on the comorbidity of OSAHS in patients with FM in Colombia are known. Considering the possible repercussions of having both diseases, we sought to characterize and measure the presence of OSAHS in a group of patients with FM and sleep disorders, referred from a rheumatology clinic to a sleep clinic.

Methods

A descriptive observational cross-sectional study was developed. Information was collected from all patients referred by Rheumatology with a diagnosis of FM and sleep complaints to a sleep clinic in the city of Cucuta (Colombia) between January 1, 2015 and August 1, 2018.

Rheumatology established the diagnosis of FM in a rheumatology center, according to the modified criteria of the American College of Rheumatology.⁸ Then, the presence of symptoms related to sleep was inquired about and those who had FM and sleep complaints, such as insomnia or fragmented sleep were referred to Pneumology.

Pneumology assessed all the patients and requested a complete baseline polysomnography to confirm or rule out OSAHS.

The apnea hypopnea index (AHI) was calculated by the number of episodes of apnea plus hypopnea per hour of sleep. The patients with AHI ≥ 5 events/h were diagnosed with OSAHS, whereas those with AHI between 5 and 15 were classified as mild and those who had between 15 and 30 events per hour as moderate; those who had AHI > 30 were considered severe, according to the criteria of the American Association of Sleep Medicine.¹⁷

The inclusion criteria were:

- Being 18 years of age or older.
- Having been referred by Rheumatology with a confirmed diagnosis of fibromyalgia and some sleep complaint.
- Having a polysomnographic record.

The study was approved by the Ethics Committee of the Clínica Neumológica y del Sueño.

Prior to the baseline polysomnography, data were collected according to institutional protocol, related to weight, height, gender, age, Epworth scale, and neck circumference.

The baseline polysomnographies were performed at the Clínica Neumológica y del Sueño with Alice 6 LDE and SleepVirtual BWII PSG polysomnographs according to the criteria of the American Association of Sleep Medicine with simultaneous measurement of electroencephalography, electrooculogram, submental and anterior tibial electromyography, electrocardiography, body position sensor, microphone for snoring, thoracic and abdominal movement, nasal cannula for flow measurement and pulse oximetry.

Data analysis

The quantitative variables were presented as arithmetic means $\pm$ standard deviations and the rest of the qualitative variables as numbers and their percentages.

Results

Of the 73 patients referred by Rheumatology with a diagnosis of FM, 51 underwent baseline polysomnography and were included in the study. The rest were excluded because they did not attend the exam.

The mean age of the sample was 65.14 ± 17.63 years. 82% of the patients studied were women and, of them, 78% had OSAHS. All men referred with fibromyalgia had associated OSAHS. 27.5% of the patients had a normal body mass index and 45% were overweight (Table 1).

OSAHS was confirmed in 82%; 23% were severe, 31% moderate and 45% mild (Table 2).

Table 1 – Sociodemographic and clinical characteristics of patients diagnosed with fibromyalgia at the Clínica Neumológica y del Sueño, years 2015-2018.

Variable	Mean	SD
Age	65.14	17.63
	Number	%
Gender		
Female	42	82.35
Male	9	17.65
BMI (kg/m^2)		
<18.5 : underweight	0	0
18.5 - 24.9 : normal	14	27.50
25 - 29.9 : overweight	23	45
≥ 30 obesity	14	27.50
Presence of OSAHS		
Present	42	82.4
Absent	9	17.6
Epworth sleepiness scale		
0-9 points	28	54.9
10-24 points	23	41.5
Neck circumference (cm)		
≤ 41	47	92.2
> 41	4	7.8
BMI: body mass index.		

Table 2 – Characteristics of the patients with fibromyalgia and OSAHS.

Variable	Patients with OSAHS (+)	
	FM (+)	
	Mean	SD
Age	57.57	12.33
BMI	27.56	4.26
	Number	%
Gender		
Female	33	78.60
Male	9	21.40
Severity of the OSAHS		
Mild	19	45.2
Moderate	13	31
Severe	10	23.8
BMI: body mass index; OSAHS: obstructive sleep apnea-hypopnea syndrome.		

Discussion

A high frequency of OSAHS was found in this group of patients with FM and sleep disorders.

The prevalence of OSAHS in the general population is 10% in men aged 30-49 years, 17% in men aged 50-70 years, 3% in women aged 30-49 years and 9% in women aged 50-70 years.¹⁸

In some studies, a high frequency of coexistence of both diseases is observed. In a recent work, İnönü et al. found 12 cases of OSAHS (50%) in 24 patients with FM, while another study reported 65.9% of OSAHS in women with FM.^{10,19}

On the other hand, when the case of patients with OSAHS was analyzed and associated FM was sought, a lower prevalence was found, as in the study conducted by Marvisi et al., in which 900 patients with OSAHS were studied and only 15% had FM.¹⁵

In the present study, the majority of patients with FM were women (82%), which is in agreement with the predominance of FM in women over men, at a ratio of 3:1.²⁰⁻²²

Likewise, we found that, of the 42 women studied, 78% had associated OSAHS, while in the group of men, 100% had it. This finding correlates with studies that indicate that FM can be a hidden marker of OSAHS in men.²³ On the other hand, Germanowicz et al. looked for FM in patients with OSAHS and detected associated FM in 9 out of 18 women and only in 2 out of 32 men,²⁴ so there is no clarity about the gender predominance in the association.

Meresh et al. sought the association of the 2 diseases and it was more common to find OSAHS in patients diagnosed with FM in a sleep clinic (85.8%) than in a psychiatric (42.0%), rheumatology (18.7%) or in other outpatient clinics (3.6%), which indicates a possible bias in the study of patients according to the specialty of the center that treats them.²⁵

Some studies report unrefreshing sleep with a frequency of 70-80% in patients with FM. Being a symptom shared with OSAHS, it is interesting to search for common pathophysiological pathways between the 2 diseases to better understand the clinical behavior of both conditions.²⁶

Since the treatment of FM represents a challenge for the clinician, the comorbidity between FM and OSAHS can make its management more complex. One study compared the clinical outcomes of patients with FM and OSAHS treated with CPAP versus patients with a single diagnosis of FM treated conventionally. The results showed that the OSAHS group had better control of symptom severity.¹⁵ According to this, the confirmation of the presence of the combination of the 2 diseases in these patients would improve their therapeutic approach.

The limitations of the study include the possible selection bias due to the fact that the characteristics of 22 patients excluded from the study for not having polysomnography are unknown, as well as the absence of a sampling process. Another limitation is that only FM patients who had a sleep complaint were referred and the rest were excluded from the study.

Multicenter prospective studies are needed to confirm these findings and investigate the response to CPAP in patients with both diseases.

Funding

The authors declare that they have not received any type of funding for the research or the preparation of the article.

Conflict of interest

None.

REFERENCES

1. Moyano S, Kilstein JG, Alegre de Miguel C. Nuevos criterios diagnósticos de fibromialgia: ¿vinieron para quedarse? *Reumatol Clin.* 2015;11:210-4, <http://dx.doi.org/10.1016/j.reuma.2014.07.008>.
2. Clauw DJ, Arnold LM, McCarberg BH. The science of fibromyalgia. *Mayo Clin Proc.* 2011;86:907-11, <http://dx.doi.org/10.4065/mcp.2011.0206>.
3. Phillips K, Clauw DJ. Central pain mechanisms in chronic pain states - Maybe it is all in their head. *Best Pract Res Clin Rheumatol.* 2011;25:141-54, <http://dx.doi.org/10.1016/j.berh.2011.02.005>.
4. Wolfe F, Ross K, Anderson J, Russell IJ, Hebert L. The prevalence and characteristics of fibromyalgia in the general population. *Arthritis Rheum.* 1995;38:19-28, <http://dx.doi.org/10.1002/art.1780380104>.
5. Londoño J, Peláez Ballesteros I, Cuervo F, Angarita I, Giraldo R, Rueda JC, et al. Prevalencia de la enfermedad reumática en Colombia, según estrategia COPCORD-Asociación Colombiana de Reumatología. Estudio de prevalencia de enfermedad reumática en población colombiana mayor de 18 años. *Rev Colomb Reumatol.* 2018;25:245-56, <http://dx.doi.org/10.1016/j.rcreu.2018.08.003>.
6. Goldenberg DL. Fibromyalgia syndrome a decade later: What have we learned? *Arch Intern Med.* 1999;159:777-85, <http://dx.doi.org/10.1001/archinte.159.8.777>.
7. Egloff N, von Känel R, Müller V, Egle UT, Kokinogenis G, Lederbogen S, Durrer B, Stauber S. Implications of proposed fibromyalgia criteria across other functional pain syndromes. *Scand J Rheumatol.* 2015;44:416-24, <http://dx.doi.org/10.3109/03009742.2015.1010103>.
8. Wolfe F, Clauw DJ, Fitzcharles MA, Goldenberg DL, Katz RS, Mease P, et al. The American College of Rheumatology preliminary diagnostic criteria for fibromyalgia and measurement of symptom severity. *Arthritis Care Res (Hoboken).* 2010;62:600-10, <http://dx.doi.org/10.1002/acr.20140>.
9. Wolfe F, Clauw DJ, Fitzcharles M, Goldenberg DL, Häuser W, Katz RS, et al. Fibromyalgia criteria and severity scales for clinical and epidemiological studies: A modification of the ACR preliminary diagnostic criteria for fibromyalgia. *J Rheumatol.* 2011;38:1113-22, <http://dx.doi.org/10.3899/jrheum.100594>.
10. İnönü Köseoglu H, İnanır A, Okan S, Çeçen O, Kanbay A, Demir O, et al. Is there a link between obstructive sleep apnea syndrome and fibromyalgia syndrome? *Turkish Thorac J.* 2017;18:40-6, <http://dx.doi.org/10.5152/TurkThoracJ.2017.16036>.
11. Lario B, Terán J, Alonso J, Alegre J, Arroyo I, Viejo J. Lack of association between fibromyalgia and sleep apnoea syndrome. *Ann Rheum Dis.* 1992;51:108-11, <http://dx.doi.org/10.1136/ard.51.1.108>.
12. Häuser W, Perrot S, Sommer C, Shir Y, Fitzcharles MA. Diagnostic confounders of chronic widespread pain: Not always fibromyalgia. *Pain Reports.* 2017;2, <http://dx.doi.org/10.1097/PR9.0000000000000598>, e598-e598.
13. Prados G, Miró E. Fibromialgia y sueño: una revisión. *Rev Neurol.* 2012;54:227-40, <http://dx.doi.org/10.33588/rn.5404.2011556>.
14. Aytekin E, Demir SE, Komut EA, Okur SC, Burnaz O, Caglar NS, et al. Chronic widespread musculoskeletal pain in patients with obstructive sleep apnea syndrome and the relationship between sleep disorder and pain level, quality of life, and disability. *J Phys Ther Sci.* 2015;27:2951-4.
15. Marvisi M, Balzarini L, Mancini C, Ramponi S, Marvisi C. Fibromyalgia is frequent in obstructive sleep apnea and

- responds to CPAP therapy. *Eur J Intern Med.* 2015;26:e49–50, <http://dx.doi.org/10.1016/j.ejim.2015.06.010>.
16. Choy EHS. The role of sleep in pain and fibromyalgia. *Nat Rev Rheumatol.* 2015;11:513–20, <http://dx.doi.org/10.1038/nrrheum.2015.56>.
 17. 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, <http://dx.doi.org/10.1093/sleep/22.5.667>.
 18. Peppard PE, Young T, Barnet JH, Palta M, Hagen EW, Hla KM. Increased prevalence of sleep-disordered breathing in adults. *Am J Epidemiol.* 2013;177:1006–14, <http://dx.doi.org/10.1093/aje/kws342>.
 19. Mutlu P, Zateri C, Zohra A, Ozerdogan O, Mirici AN. Prevalence of obstructive sleep apnea in female patients with fibromyalgia. *Saudi Med J.* 2020;41:740–5, <http://dx.doi.org/10.15537/smj.2020.7.25165>.
 20. Topbas M, Cakirbay H, Gulec H, Akgol E, Ak I, Can G. The prevalence of fibromyalgia in women aged 20–64 in Turkey. *Scand J Rheumatol.* 2005;34:140–4.
 21. White KP, Harth M. Classification, epidemiology, and natural history of fibromyalgia. *Curr Pain Headache Rep.* 2001;5:320–9, <http://dx.doi.org/10.1007/s11916-001-0021-2>.
 22. Queiroz LP. Worldwide epidemiology of fibromyalgia. *Curr Pain Headache.* 2013;17:356, <http://dx.doi.org/10.1007/s11916-013-0356-5>.
 23. May KP, West SG, Baker MR, Everett DW. Sleep apnea in male patients with the fibromyalgia syndrome. *Am J Med.* 1993;94:505–8, [http://dx.doi.org/10.1016/0002-9343\(93\)90085-4](http://dx.doi.org/10.1016/0002-9343(93)90085-4).
 24. Germanowicz D, Lumertz MS, Martinez D, Margarites AF. Coexistência de transtornos respiratórios do sono e síndrome fibromiálgica. *J Bras Pneumol.* 2006;32:333–8, <http://dx.doi.org/10.1590/S1806-37132006000400012>.
 25. Meresh ES, Artin H, Joyce C, Birch S, Daniels D, Owens JH, et al. Obstructive sleep apnea co-morbidity in patients with fibromyalgia: A single-center retrospective analysis and literature review. *Open Access Rheumatol Res Rev.* 2019;11:103–9, <http://dx.doi.org/10.2147/OARRR.S196576>.
 26. Paul JK, Iype T, Dileep R, Hagiwara Y, Koh JW, Acharya UR. Characterization of fibromyalgia using sleep EEG signals with nonlinear dynamical features. *Comput Biol Med.* 2019;103331, <http://dx.doi.org/10.1016/j.compbiomed.2019.103331>.