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Case Report

A Case of Rheumatoid Arthritis and Obstructive Sleep Apnea

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Abstract

Introduction: Rheumatoid arthritis (RA) is the most prevalent autoimmune inflammatory arthritis found in adults. Patients with this disease, experience a decrease in quality of life and are at increased risk of disability and premature death. The high levels of inflammation that characterize RA can raise the risk for heart disease.

Sleep disorders are common in patients with increased pain perception and fatigue severity to which they has been independently linked. Obstructive sleep apnoea (OSA) is a significant public health concern and contributes to increased cardiovascular morbidity and mortality.

Patients with OSA can suffer from repeated episodes of hypoxia and normoxia, which are reminiscent of ischemia-reperfusion events and are believed to promote the production of reactive oxygen species and inflammation - as in ischemia-reperfusion injury to the vascular wall - increasing the risk for atherosclerosis. The coexistence of sleep apnoea in rheumatic disease patients can influence the severity of their reported symptoms of pain and fatigue and enhance the risk for cardiovascular events.

We describe a case report of a patient with RA and OSA.

Case Report: AG, 62 years-old, obese female, had suffered from RA for 4 years, developing insomnia and restless legs syndrome and daytime symptoms, such as pain, stiffness and fatigue. Her medical history revealed arterial hypertension and dyslipidemia syndrome.

Despite optimization of the immunosuppressive treatment, her symptoms remained unchanged.

She underwent a pulmonary examination on suspicion of OSA, which was confirmed by nocturnal cardiorespiratory monitoring. The patient was diagnosed with severe OSA and was administered automatic positive airway pressure therapy, with benefit.

Conclusion: Sleep abnormalities have also been linked to increased pain and fatigue perception, which are common concerns in rheumatology patients. Physicians must diagnose and treat OSA early in rheumatic diseases. Treatment might be beneficial in terms of future cardiovascular and respiratory morbidity, and improve measures of fatigue and pain, and the quality of life of these patients.

Keywords: *Rheumatoid Arthritis; Obstructive Sleep Apnea*

Introduction

Sleep disorders are common in patients with chronic diseases, such as rheumatoid arthritis (RA) [1,2]. The risk of OSA among RA patients reaches as high as 50% [3].

Obstructive sleep apnea (OSA) is more common in RA than in the general population. OSA is a specific sleep disturbance that is characterized by recurring apnoeas (cessation of airflow for 10s or longer) or hypopnoeas during sleep. OSA is defined by the American Aca-

demy of Sleep Medicine as repetitive episodes of upper airway obstruction that occur during sleep and are usually associated with a reduction in oxygen saturation [4]. When accompanied by excessive daytime somnolence or fatigue, the term "OSA syndrome" can be used.

RA is a chronic inflammatory and autoimmune disorder that can damage many body systems, including the skin, eyes, lungs, heart and blood vessels. It affects the lining of joints, causing painful swelling that can eventually result in bone erosion and joint deformity [5]. The inflammation that is associated with RA can damage other parts of the body. Early RA tends to affect the smaller joints first (fingers, hands, toes, feet). As the disease progresses, the symptoms often spread to the wrists, knees, ankles, elbows, hips and shoulders [5]. Approximately 40% of those with RA experience signs and symptoms that do not involve the joints (e.g. skin, eyes, lungs, heart, kidneys) [5].

With regard to RA, certain factors appear to contribute to the higher risk of sleep apnea, including micrognathia, cervical spine abnormalities, involvement of the temporomandibular joint, involvement of the cricoarytenoid joint, and obesity [6-11].

Patients with OSA and RA experience elevations in circulating acute-phase markers and pro-inflammatory cytokines, such as TNF-α [12]. Intermittent hypoxia, present in OSA increases inflammatory cytokine production [13]. RA is characterized by elevation in proinflammatory cytokines in TNF-α, to the extent that its forms the basis for targeted biologic therapies. In a sufficiently predisposed individual, this rise in TNF levels has been hypothesized to increase the susceptibility to OSA [12]. Obesity the principal factor of risk factor for OSA, has recently been linked to a greater risk for developing RA [13,14]. The direct involvement of active adipose tissue in promoting inflammatory processes ha salso recently been reported [15].

In light of the data on the link beetween sleep disturbances and RA, although the mechanisms that connect them remain unknow, we describe a case of RA and severe OSA syndrome, benefiting from treatment with automatic positive airway pressure (aPAP) therapy.

Case Report

AG, a 62 years-old, obese female (no alcohol use) suffering from RA for 4 years, was admitted to our sleep surgery department for a history of insomnia and snoring.

She had also restless legs syndrome and daytime symptoms, such as hypersomnolence, pain, stiffness and constant fatigue.

Her medical history revealed also history arterial hypertension and a dyslipidemia syndrome.

Despite optimization of the immunosuppressive treatment, her symptoms remained unchanged. Thus she underwent a pulmonary examination on suspicion of OSA.

The clinical examination findings revelead: a BMI (body mass index) of 32.5 kg/m^2: neck circumference of 41 cm and an enlarged abdomen with adipose tissue (abdominal circumference 110 cm) The Epworth sleepiness scale showed a high degree of sleepiness, with a score of 16/24 [16] and the 6-point STOP Bang questionnaire revealed a suspicion of OSA [17]. She had retrognathia and micrognathia. The Mallampati classification value was 4.

On evaluation, her pulse pressure was normal, rapid and regular and her blood pressure was 130/80 mmHg, Her hearth rate was 80/min, respiratory rate was 12 a/min, and SpO_2 was 95% in room air The arterial blood gas analysis showed: pH 7.45, PaO_2 80 mmHg, $PaCO_2$ 43 mmHg, pH 7,43, $SatO_2$ 94% HCO_3 25 mmoli/L. The physical examination was negative. Muller maneuver was performed to reveal any tracheal collapse.

Echocardiography showed an ejection fraction of 60%, moderate mitralic aortic insufficiency and moderate pulmonary hypertension.

The patient underwent home sleep test (HST) in room air. Apneas, hypopneas, and apnea-hypopnea index (AHI) were defined per current criteria [4]. Events of obstructive apneas (OA) and central apnea (CA), number and events of hypopnea (H) and average of arterial saturation (SpO_2 average%) with time of desaturation (T < 90%) were also analyzed.

The examination revealed severe OSA (AHI 100/h) with HST (Table 1 and figure 1). Consequently, the patient underwent with automatic positive airway pressure (aPAP 4 - 12 cmH_2O) therapy which had a benefit and corrected her polygraphic indexes (Table 1).

	Diagnostic	aPAP (4 - 12 cmH_2O)
AHI (Index)	100.8	5
RDI (Index)	100.5	5
OA (Index)	73.8	-
CA (Index)	11.6	1.4
H (Index)	16	2.5
SpO_2 average (%)	87%	94
T < 90%	63.5%	10

Table 1: *Diagnostic and therapeutic HST results.*

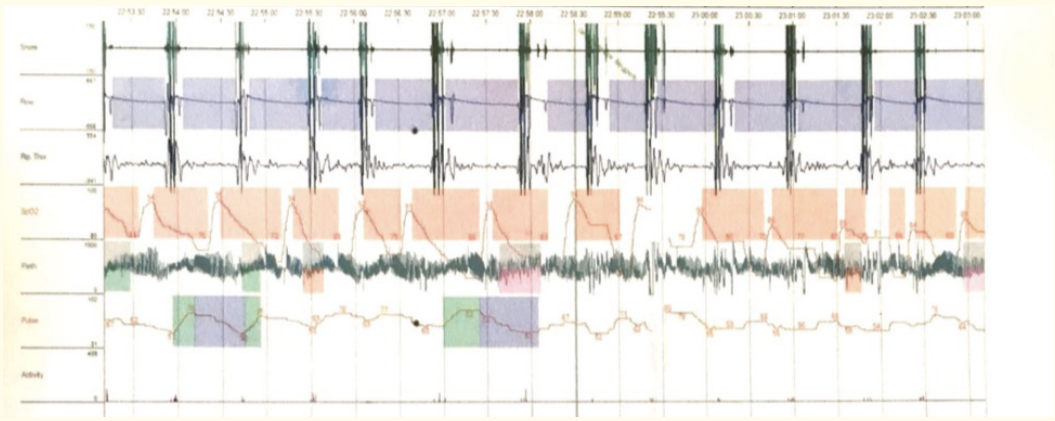

Figure 1: *Images of HSAT.*

At the 3 months follow-up the patient's quality of life had improved, with a reduction in pain and fatigue had and a decline in ESS to 9/24.

Discussion

RA is a chronic, autoimmune and inflammatory disease. The characteristics of this disease are symmetrical joint pain and joint damage, which can be systemic effects and extraarticular manifestations.

RA and subsequent OSA has been associated extensively.

An earlier case report in 1983 noted that a patient with RA-related adult-acquired micrognathia could develop severe OSA [18].

Our case describes an RA patient with hypersomnolence, restless legs syndrome, pain, stiffness and fatigue. She had micrognathia and after a home sleep test she was diagnosed with severe OSA syndrome. Micrognathia is a condition in which the lower jaw is smaller than normal. This is often a characteristic of juvenile idiophatic arthritis juvenile idiopathic arthritis. It can also occur as adult-acquired micrognathia that is associated with RA - in some cases due to destruction of the temporomandibular joint - leading to obstruction of the upper airway and OSA [19].

Several case studies have reported an increased risk of OSA in patients with RA with cervical or temporomandibular lesions [20,21].

Upper airway obstruction is significantly more often in patients with arthritis of the temporomandibular joints than in those with normal joints. Further 70% of the patients with severe arthritic destruction of the temporomandibular joints, experience episodes of airway obstruction. Upper airway obstruction is assumed to occur in these patients due to a pharyngeal obstruction, as in patients with micrognathia or sleep apnea syndrome [8].

Our patient had other risks factors for OSA: obesity (BMI 32.5 Kg/m^2) and abdominal obesity.

In the adult population, the prevalence of OSA is estimated to be ~25% and reaching as high as 45% in obese subjects [22,23]. Obesity predisposes one to and potentiates OSA. The prevalence of OSA and its consequences are likely to increase in light of the current obesity epidemic. Recent estimates suggest that 60% of the adult population in industrialized countries is overweight (BMI ≥ 25 kg/m^2) and that at least 30% is obese (BMI ≥ 30 kg/m^2) [24].

Further, OSA correlates more strongly with an increased neck size and waist circumference than general obesity [25,26]. OSA is particularly prominent among men who have a collar size that is greater than 43 cm and women who have a neck size that exceeds 40 cm [27]. In a separate study the cutoff values for waist circumference and waist-to-height ratio for females with OSA were 95.5 cm and 0.595, respectively, whereas those for males were 100.5 cm and 0.575 [28].

Treatment for coexisting OSA in patients with RA might be beneficial in terms of future cardiovascular and respiratory and improve measures of fatigue, pain and inflammatory markers [12]. Our study shows that the treatment of sleep disorder enhance the quality of life in RA patient, improving measures of fatigue and pain.

Conclusion

Patients with RA might be at increased risk for sleep disorders, particularly OSA.

The association between rheumatoid arthritis and sleep apnea might significantly increase morbidity - particularly cardiovascular events and mortality - in persons who have both conditions.

This clinical case underscores the importance of identifying OSA in rheumatological diseases in its optimal management. An earlier diagnosis is needed for timely treatment and can improve the long-term clinical outcomes of RA disease.

Conflict of Interests

All authors declare that they have no competing interests.

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