

ENDOCRINOPATHIES AND SLEEP APNEA

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ABSTRACT

One of the most common sleep breathing disorders is obstructive sleep apnea (OSA). It is characterized by recurrent episodes of upper airway collapse during sleep, which lead to severe consequences including intermittent hypoxia, fluctuations in blood pressure and heart rate, increased sympathetic nervous system activity, endocrine dysfunction, and sleep fragmentation¹⁻⁵.

Keywords: acromegaly, apnea, hypopnea, polysomnography, IRF-1.

INTRODUCTION

The results of recent studies indicate a connection between OSA and endocrine diseases, such as acromegaly, Cushing's disease and syndrome, thyroid dysfunction, diabetes mellitus and obesity. In addition, there is evidence of an association between hypogonadism and OSA, regardless of the patient's age and weight. In women, there is a negative correlation between the apnea-hypopnea index and the level of serum estradiol and progesterone, which suggests a connection between OSA and ovarian dysfunction. Sleep disturbances of varying degrees (from simple snoring to severe OSA) occur in most patients with acromegaly⁶⁻¹⁰. In prospective and retrospective studies using polysomnography to diagnose OSA, the prevalence of this disorder among patients with uncontrolled acromegaly averaged 69%. At the same time, breathing disorders during sleep can aggravate cardiovascular pathology, which is one of the main causes of death in acromegaly¹¹⁻¹⁵.

MATERIALS AND RESEARCH METHODS

In our study, which involved 55 patients with acromegaly (18 men (28.2%) and 37 women (67.38%)) who were undergoing inpatient treatment in the Diabetology Department of the Russian Republican Scientific and Practical Center for Emergency Medicine, the majority of the examined patients had sleep disturbances (85.4%, n =

47), as evidenced by the increased apnea-hypopnea index, which was 27.0 [12.0; 47.0]. Among them, 27 patients (49.1%) had severe sleep apnea, 13 (23.6%) patients had moderate apnea, and 7 (12.7%) had mild sleep disordered breathing. The reasons for the high prevalence of OSA in patients with acromegaly are craniofacial deformation, as well as thickening and swelling of soft tissues, which lead to a narrowing of the lumen of the upper respiratory tract and, accordingly, obstruction of air flow¹⁶⁻²⁰. The cause of soft tissue swelling may be increased sodium reabsorption in the distal tubules of the kidneys due to the direct stimulating effect of growth hormone and IGF-1. Another factor contributing to the occurrence of OSA in patients with acromegaly may be overweight and obesity. In addition, if, along with acromegaly, the patient has hypothyroidism, including central one, then it can also contribute to the occurrence of apnea. Finally, a role for impaired neuromuscular control of the pharyngeal muscles cannot be excluded, since myopathy of the pharyngeal dilator and sternohyoid muscles has been observed in experimental animal models of acromegaly. Effective treatment of acromegaly (surgical or drug) leads to a decrease in breathing disorders during sleep, but in a significant number of patients, manifestations of OSA persist, despite the controlled phase of acromegaly. This fact indicates the need to conduct research to identify sleep breathing disorders in all patients with acromegaly, regardless of the presence of clinical and biochemical remission²¹⁻²⁶.

Research results. The results of a number of prospective and retrospective studies indicate an increase in the prevalence of OSA in patients with hypothyroidism. The main reason may be the infiltration of soft tissues with mucopolysaccharides and proteins, which is a characteristic manifestation of hypothyroidism and leads to a narrowing of the lumen of the upper respiratory tract⁴¹. In addition, dysregulation of the pharyngeal dilator muscles due to the development of myopathy, as well as enlargement of the thyroid gland as such, may also be involved in the occurrence of obstruction, even in the absence of dysfunction of the thyroid gland. In the case where a decrease in thyroid function is not accompanied by other disorders, in particular obesity, there is a fairly good chance that the appointment of replacement therapy for hypothyroidism with levothyroxine sodium will lead to a significant reduction in breathing disorders during sleep²⁷⁻³⁵. Whereas a combination of conditions, each of which in itself can be the cause of the development of OSA, reduces the likelihood of normalization of respiratory disorders without the use of special therapy, which consists of creating continuous positive pressure in the upper respiratory tract (CPAP therapy). Given that hypothyroidism occurs in less than 5% of patients with OSA, this is probably not a mandatory procedure, but if it is detected, it makes sense to wait for the effect of levothyroxine sodium replacement therapy before recommending CPAP - therapy. In the pathogenesis of breathing disorders during sleep with hypercortisolism

due to Itsenko-Cushing syndrome or disease, centripetal obesity is of greatest importance, that is, fat deposition in the face, neck, abdomen, and also, probably, in the parapharyngeal space³⁶⁻⁴⁰.

CONCLUSIONS

From a practical point of view, it is necessary to be wary of the development of breathing disorders during sleep in patients who are planned to be prescribed androgen therapy and, in case of corresponding complaints, recommend an examination to exclude this pathology. Thus, endocrine diseases may be accompanied by sleep-disordered breathing, in particular OSA. Treatment of the underlying disease in some cases can help reduce the manifestations of OSA, but often these measures are insufficient. Considering the potential risk of developing cardiovascular pathology and cognitive impairment due to OSA, in such patients it is necessary to promptly identify sleep-disordered breathing and prescribe CPAP therapy.

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