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HYPOGONADISM AND OBESITY: CORRELATION AND CLINICAL MANAGEMENT

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Abstract: The objective of this study is to report the case of a male patient treated at the Basic Health Unit with obesity who had hypogonadism and was using injectable testosterone. The information was obtained by reviewing the medical records, interviewing the patient and reviewing the literature. The case reported and publications raised bring to light the discussion of the correlation of a complex situation that is hypogonadism in obese patients and its clinical management. In addition to exposing the main concepts regarding the two pathologies, hypogonadism and obesity, their pathophysiology and correlating with the systemic repercussions of both. In addition, the work highlights the indications for non-pharmacological treatment and androgen replacement in order to provide an improvement in the patient's quality of life.
Keywords: Hypogonadism; obesity; testosterone.

INTRODUCTION

Male hypogonadism occurs due to androgen deficiency. As androgens play a crucial role in the development and maintenance of both sexual and multiple organ functions, their deficiency can lead to sexual dysfunctions, decline in muscle strength, disturbance in lipid metabolism, fatigue and cognitive dysfunction, in addition to being an important factor in the male depression (JUNGWIRTH, DIEMER, et al., 2012). Hypogonadism is associated with increased morbidity and mortality in several studies (ANTONIO, CW WU, et al., 2016)

Androgen deficiency increases with aging, with an annual decline of 0.4-2% in circulating testosterone. The incidence in middle-aged men is 6% and is more prevalent in the elderly, obese and with multiple comorbidities (JUNGWIRTH, DIEMER, et al., 2012). In aging, this deficiency is called "Androgen

Deficiency of Aging Male" (ADEM). Several studies indicate that during advancing age, there is a reduction in serum testosterone levels and an increase in sex hormone-binding globulin (SHBG), reducing its bioavailable portion (BERTERO, DA ROS, et al., 2017).

Testosterone, the main circulating androgen, is present in the blood bound to proteins (98%), mainly SHBG (sex hormone binding globulin) and albumin, only 2% are free from binding. SHBG binds to testosterone, which is not available to bind to the androgen receptor and act on target tissue. Already bound to albumin has low affinity and its dissociation is fast, thus, testosterone bound to albumin and free testosterone are called bioavailable testosterone, being the most active fraction (M. MATSUMOTO and J. BREMNER, 2004).

One of the most important factors for testosterone deficiency in men is obesity (M. MATSUMOTO and J. BREMNER, 2004). Regarding the pathophysiology, the mechanisms are complex, it is understood that in obese men aromatase enzymes are increased due to the large amount of adipose tissue, where they are produced, and thus reduce testosterone levels and increase estrogenic hormones (J FERNANDEZ, C CHACKO and M PAPPACHAN, 2019).

In addition, testosterone deficiency will further facilitate adipocyte differentiation, inflammation and insulin resistance. Due to the pathophysiology, there is a resulting increase in estrogen, leptin, insulin and inflammatory cytokines. The increase in estrogens by aromatization results in suppression of the hypothalamic-pituitary-testis (HPT) axis through negative feedback, further reducing testosterone levels (J FERNANDEZ, C CHACKO and M PAPPACHAN, 2019).

Bidirectionally, testosterone deficiency is also associated with an increase in triglyceride storage and, consequently, an increase in total body fat (M KELLY and HUGH JONES, 2013).

Thus, obesity is a reversible cause of HPT axis suppression and testosterone deficiency (hypogonadism) and thus can also be treated with lifestyle changes for weight loss and possibly without the need for hormone replacement, since, its indication is judicious (J FERNANDEZ, C CHACKO and M PAPPACHAN, 2019).

Regarding diagnosis, the main instruments used in the diagnostic evaluation are the clinical picture of hypogonadism and the demonstration of morning serum testosterone level below the minimum reference value for young adults (BERTERO, DA ROS, et al., 2017). The most accurate marker of hypogonadism would be free testosterone or bioavailable testosterone, as the increase in SHBG in aging increases the binding of testosterone, not being available to act on receptors (BERTERO, DA ROS, et al., 2017).

The aim of androgen replacement therapy is to reproduce the physiological actions of endogenous testosterone as the disturbances produced are mostly irreversible. Hormone replacement is indicated for the treatment of hypogonadism with the aim of returning libido, improving sexual function and providing well-being. In addition, androgen treatment prevents osteoporosis, improves cognitive function and regulates growth hormones to normal levels, especially in the elderly (C. E. GEBARA, W. VIEIRA, et al., 2002). It is indicated for men aged 55 to 69 years, and is recommended before starting treatment and 3 to 12 months after the man undergoes a urological evaluation to assess for nodules or induration of the prostate and to assess the risk of prostate cancer (BHASIN)., P BRITO, et al., 2018). Since this replacement has absolute contraindication for patients with prostate and breast cancer (C. E. GEBARA, W. VIEIRA, et al., 2002).

Furthermore, aiming at the possible adverse effects of androgen replacement therapy (ART), prior to its initiation, a lipid assessment and baseline hematocrit measurement must be performed, since the administration of testosterone is associated with an increase in its levels, in addition to ruling out a history of sleep apnea (BERTERO, DA ROS, et al., 2017). Among the potential adverse effects, there is infertility, by suppression of spermatogenesis, prostate cancer and cardiovascular risk (ARTHUR BRUNHARA ALVES BARBOSA and CURY, 2018).

Testosterone treatment in men with hypogonadism has also shown significant improvement in libido, erectile function, and sexual activity (8). In this sense, testosterone treatment options include intramuscular injection, transdermal gel, long-term intramuscular injection or tablets (ARTHUR BRUNHARA ALVES BARBOSA and CURY, 2018).

CASE DESCRIPTION

ANAMNESIS

A 68-year-old retired patient arrives at a consultation at a Basic Health Unit requesting the prescription of injectable testosterone, which had previously been prescribed by another doctor, and his medicines for hypertension, namely Losartan and Hydrochlorothiazide. The patient presented the previous prescriptions at the consultation. In addition, he requests laboratory tests, claiming that he had not done them for years.

He reports that 4 years ago he measured his testosterone level and that it was low and, since then, he uses 250 mg of testosterone intramuscularly every 3 months. 2 years ago he stopped using it and complains of weakness, apathy and discouragement in carrying out his daily activities. In addition, he also reported reduced libido, difficulty maintaining an erection and performing ejaculation, in addition to referring to a reduction in ejaculate volume.

When asked about prostatic symptoms, he reports reduced urinary stream force and hesitancy. He denies nocturia, nocturia, dysuria, hematuria or other complaints.

Regarding the interrogation of the various devices, he denied other symptoms.

When asking about his pathological antecedents, the patient mentions that he has Systemic Arterial Hypertension. Regarding the medications in use, he makes daily use of Losartan and Hydrochlorothiazide. The patient reported having undergone a vasectomy and denied other previous surgeries. Regarding life habits, he reported smoking, 1 pack of straw cigarettes a day, in addition to social alcoholism. He performs physical activity on his farm. Regarding family history, he denied cancer in the family.

PHYSICAL EXAM

The patient was in good general condition, oriented in time-space and well informed. Regarding the skin and annexes, he was normal colored, hydrated and with the presence of ecchymosis in the upper limbs, which the patient reported to have been due to local trauma. Patient had central obesity, weight of 106.2 kg, height of 1.73 m, BMI 35.51 and abdominal circumference of 112 cm.

In the cardiovascular system, precordium without bulges or retractions was observed. Rhythmic, normophonetic heart sounds in two beats and absence of murmurs. The measured blood pressure was 190x120 and the heart rate was 80 bpm.

On examination of the respiratory system, the patient was eupneic and had an atypical chest. Absence of respiratory effort and bilaterally preserved expandability. Clear lung sound to percussion. Vesicular murmur audible at apexes and bases, without

adventitious sounds.

In the abdomen, it was found in the inspection, globular abdomen, absence of skin lesions, absence of collateral circulation or herniations. Arterial pulsations and peristalsis not identifiable on inspection. On auscultation, normal hydro-air sounds in the four quadrants and absence of murmurs in arterial foci. On percussion, the abdomen was tympanic, with the exception of the hepatic space, free Traube space. Impalpable liver and spleen. Painless abdomen on superficial and deep palpation. No signs of peritoneal irritation. Absence of masses.

Regarding the examination of the genitalia, he presented topical testes measuring approximately 6 cm. A touch exam was performed, showing a prostate of normal size and fibroelastic consistency, a nodule of small volume, fibroelastic consistency, smooth, with benign characteristics was identified.

In the limbs, mild edema 1+/4+, ocher dermatitis and deformity in the toes with reduced mobility, due to probable arthrosis, were observed.

DIAGNOSTIC HYPOTHESIS

The diagnostic hypothesis of hypogonadism was made, due to its clinical picture.

CONDUCT

Laboratory tests of liver function, blood count, lipidogram, total testosterone dosage and ultrasound of the total abdomen were requested, mainly to evaluate the liver, due to his request for injectable testosterone. Losartan and Hydrochlorothiazide are prescribed for High Blood Pressure. Furthermore, it was clarified to the patient that injectable testosterone could not be prescribed before a complete evaluation, which would be verified from the requested exams.

In addition, guidelines were provided on the need for weight loss due to the relationship between obesity and hypogonadism. The change in lifestyle was stimulated through a balanced diet and physical activity. The patient was referred to a nutritionist.

DISCUSSION

Hypogonadism can be caused by a huge variety of etiologies and has several risk factors involved in its pathogenesis, such as aging, obesity and sedentary lifestyle (JUNGWIRTH, DIEMER, et al., 2012).

In the clinical case described, we are faced with clinical aspects that corroborate the association between the clinical picture of the hypogonadism patient and obesity, since it is one of the main causes of low testosterone level, due to pathophysiological mechanisms, such as increased peripheral conversion, mainly (M. MATSUMOTO and J. BREMNER, 2004).

The diagnostic hypothesis of hypogonadism was attributed to the case due to the patient's symptoms of fatigue, reduced libido, erectile and ejaculatory dysfunction, associated with symptoms having exacerbated after ceasing the use of intramuscular testosterone (JUNGWIRTH, DIEMER, et al., 2012).

Hypogonadism, in this case, must be approached in detail, with a rigorous clinical evaluation to indicate the best treatment. In the case described, the patient had central obesity, which could be a cause of secondary hypogonadism (J FERNANDEZ, C CHACKO and M PAPPACHAN, 2019).

In addition, considering the possible adverse effects of androgen replacement therapy, the patient must undergo a thorough evaluation before starting treatment, with lipid evaluation, prostate evaluation, baseline hematocrit measurement and rule out sleep apnea, in order to prevent possible iatrogenic events. and guide you about its risks and benefits (BERTERO, DA ROS, et al., 2017).

Thus, initially, in some cases, lifestyle

changes may be sufficient to improve symptoms, since excess adipose tissue reduces circulating testosterone, in addition to increasing estrogen levels (J FERNANDEZ, C CHACKO and M PAPPACHAN, 2019).

Considering the diagnostic suspicion of the case described, it is concluded that hypogonadism must be evaluated and treated correctly, in order to improve the patient's symptoms and quality of life, in addition to weighing the risks and benefits of each therapeutic form.

Thus, with obesity associated in this case, an immediate intervention would be to change the patient's lifestyle. Such conduct would only bring benefits to the general health of the patient, both in their hypertension and in their symptoms of low testosterone. In this sense, with the change in lifestyle, the patient could reduce their percentage of body fat and thus increase their serum testosterone levels naturally.

On the other hand, testosterone replacement as a therapeutic method could not be ruled out, since it has benefits and the change in lifestyle may not be enough to improve the patient's complaints. However, this treatment must be well indicated and performed after the recommended evaluations, aiming at the benefit of the patient.

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