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The andropause symptoms and its relationship with the blood testosterone: a preliminary cross-sectional study in Ahvaz, Iran

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Abstract

Introduction: Andropause is an age-related decline in serum testosterone level and a constellation of signs and symptoms of hypogonadism. The primary aim of this study was; to evaluate the andropause symptoms and its relationship with the blood testosterone in Iranian men in Ahvaz.

Materials & Methods: In this preliminary study 90 male university staffs with an age of more than 40 were randomly recruited from Ahvaz Jundishapur University of Medical Sciences. Participants were asked to complete the androgen decline in the aging male (ADAM) questionnaire. Anthropometrics and their serum levels of free and total testosterone were measured.

Results: According to the ADAM's questionnaire, 66 (73.3%) reported andropause symptoms, of which 9 (13.8%) of them had a low level of free testosterone and 39 (59.2%) had a low level of total testosterone. The remaining symptomatic men had a normal level of free testosterone. There was no significant relationship between participants with and without andropause symptoms regarding age, BMI, blood pressure, income, free and total testosterone.

Conclusion: There was a high level of andropause symptoms according to the ADAM questionnaire that was highly discrepant with the blood test for total and free testosterone. It seems that some symptoms in the ADAM questionnaire may relate to the other socio-economic factors e.g. income.

Keywords: Andropause symptoms, Free testosterone, Total testosterone, ADAM questionnaire

Introduction

Andropause is a decline in the level of blood testosterone and a constellation of signs and symptoms of hypogonadism. Andropause is also called "male menopause", as it generally happens to men in middle age, about the same time that menopause happens to women(1). Clinical diagnosis of andropause is sometimes a problem, even using the serum testosterone measures or clinical symptoms. Some symptoms relating to the androgen decline are more frequent among older men, change

in muscle strength (2) and sexual function (3). Diagnosis of andropause can be done by considering both subjective symptoms and blood tests of total and free testosterone, however, very few correlations have been found between symptoms and plasma testosterone levels(4). The prevalence of hypogonadism in men is not similar at different ages; and approximately 20% of men in their 60s have biochemical evidence of androgen deficiency, increasing to 50% of men in their eighth decade of life (5). The decrease in serum androgen may result in

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significant alterations in the quality of life and adversely affect the function of multiple organ-systems (6). The effect of hypogonadism on morbidity and mortality in men is not fully addressed in the large cross-sectional studies. However, some small epidemiological studies addressed an association of hypogonadism and morbidity, such as depression, resulting from decreased testosterone in middle aged men (7-9).

The Saint Louis University Androgen Deficiency in the Aging Male (ADAM) questionnaire developed by Morley et al. has been widely used as a screening tool for detecting men at risk for androgen deficiency since its development in 2000. It was shown to have a sensitivity of 88%, emphasizing its utility as a screening test (10). In Iran, there is no exact way to operationally define androgen deficiency. Thus, in order to get some epidemiologic data in Iran, the primary aim of this study was to evaluate the andropause symptoms and its relationship with the blood testosterone in men in Ahvaz, Iran.

Material and Methods

This was a preliminary cross sectional study on which 100 men among 200 eligible male staff in the Ahvaz Jundishapur University of Medical Sciences were randomly selected. The inclusion criterion was an age of more than 40. Men with known chronic disease (heart disease, diabetes, hyper blood pressure) were excluded. This study was approved by the Ethics Committee of Ahvaz Jundishapur University of Medical Sciences. A written consent was obtained from all participants prior to the study. All participants were asked to complete a

questionnaire consisting of socio-demographics and Saint Louis University's ADAM questionnaire about andropause symptoms. The ADAM's questionnaire was translated into the Persian. Height was measured using a SECA stadiometer and weight was measured using a SECA digital scale. Blood pressure was measured using a mercury blood pressure device when participants were sitting and after 10 minutes rest. Five ml vein blood was withdrawn and sent to one reference laboratory for measuring free and total testosterone. Serum free and total testosterone were measured using direct immunoenzymatic determination of free and total testosterone in human serum (DKO015 and DKO002, respectively). The reference value for total testosterone was 1.8-9 ng/ml and for free testosterone it was 4.5-42 pg/ml. The measurements were standardized according to the information supplied by the manufacturer of the kit.

Data entering and analysing were done using SPSS ver 17. The descriptive, chi-square and independent t-test were used for statistical purposes.

Ethical considerations

This study was conducted after obtaining the confirmation of the Ahvaz Jundishapur Ethics Committee and the informed consent from all subjects participating in the study.

Results

Of 200 eligible men in the Ahvaz Jundishapur University of Medical Sciences, 100 men were randomly selected and 90 men returned questionnaires. According to the ADAM questionnaire, participants were

classified into two groups (having andropause symptoms and without andropause symptoms). The basic characteristics of the two groups are listed in Table 1. Table 2 is demonstrating the distribution of andropause symptoms according to the ADAM questionnaire. As evident in Table, more than 50% of participants had reduction of libido, lack of energy, decrease in strength/endurance, enjoyment of life, less strong erection, deterioration in ability to play sports and increasing sadness.

According to the ADAM questionnaire, 66 (73.3%) of participants had andropause

symptoms, of which 9 (13.8%) had a low level of free testosterone and 39 (59.2%) had a low level of total testosterone. The remaining symptomatic men had a normal level of free testosterone. Of 24 (26.7%) asymptomatic men, 14 (58.3%) had a low level of total testosterone and 3(12.5%) had a low level of free testosterone.

There was no significant relationship between participants with and without andropause symptoms regarding age, BMI, blood pressure, income or free and total testosterone (Table 1).

Table 1: Basic anthropometric, socioeconomic, physiological and biochemical parameters reflecting on the andropause syndrome in Iranian men in Ahvaz

Characteristics	Andropause Symptoms n=66 Mean ±SD	Without andropause symptoms n=24 Mean ±SD	p value
Age	50.8 ±5.7	50±4.6	0.5
BMI(kg/m ²)	26.4 ±3.9	26.2±3.4	0.7
Systolic blood pressure (mmHg)	130.7±21.6	125.8±28.9	0.3
Diastolic blood pressure (mmHg)	75.3±9.5	73.7±7.6	0.4
Income (Rials) And \$	5,640,000 ±5,830,000 \$ 564± 583	5,760,000±2,270,000 \$ 576± 227	0.9
Total testosterone (ng/ml)	2.1±2.5	1.8±1.3	0.6
Free testosterone (pg/ml)	10.2±4.5	10.5±4.9	0.7

Table 2: Distribution of Andropause symptoms according to ADAM questionnaire among participants

Variables	N (%)
Reduction of Libido	46 (51.1)
Lack of energy	52(57.8)
Decrease in strength/endurance	52(57.8)
Increasing weight	23(25.6)
Decreased enjoyment of life	45(50)
Increasing sadness/or grumpy	46(51.1)
Less strong erection	49(54.4)
Recent deterioration in ability to play sports	49(54.4)
Falling asleep after meal	38(42.2)
Recent deterioration in the work performance	28(31.1)

Discussion

The results of this study showed that more than 70% of participants had andropause symptoms according to the ADAM questionnaire. In a study in Massachusetts, the results showed that the crude incidence rate of andropause was 12.3 per 1000 person-years, which suggests to a prevalence of 481,000 new cases of andropause per year in men aged 40 to 69 in the United States (11). In another study in India on 157 men aged 40-60 years, andropause symptoms, according to the ADAM's questionnaire were found in 67.5% of the participants (12). Results of our study are in line with the study in India.

While the frequency of andropause symptoms is relatively high in the present study, the blood free testosterone was not consistent with these symptoms. Free testosterone that was less than normal was found in nearly 14% of men. In Goel et al.'s study they found that 21.6% of men had a low level of free testosterone (2). In a longitudinal study by Harman et al., the reported rates for reduced levels of free testosterone were 9% for men aged from 50 to 59 years and 34% for men aged between 60 and 69 years (5). Other authors have also reported that various psychosocial factors such as career, relationship with spouse and children, financial well-being and social status influence the age related changes experienced by men (12-13). It seems that in our study economical issues played the main role in andropause symptoms, for example most of the participants were categorized in the middle or low income categories in this study and 77(85.6%) of the participants' wives were housewives and most of them had 3 children.

In a study by Mulligan et al., they found that the crude rate of hypogonadism in men aged more than 45 was 36.3% and that the odds ratios for having hypogonadism were significantly higher in men with hypertension, hyperlipidaemia, diabetes, obesity, prostate disease and asthma or chronic obstructive pulmonary disease than in men without these conditions (14). The discrepancy between our study and Mulligan et al, might be because in our study we did not recruit men with chronic diseases.

In the present study more than half of men had decreased libido. In a study by Blümel et al, results showed that; decreased sexual desire is a better predictor of hypogonadism than that the complete ADAM questionnaire. In our study there was not any correlation between reduction of libido and total or free testosterone, it may result from our participants were younger than that in the Blümel et al (15).

One of the limitations of this study is; sampling was limited to the Ahvaz Jundishapur Medical University of Sciences. In Iran it is not easy for men to talk about their sexual problems. Because of this limitation, we could not recruit other men in the society and could only recruit men from the university.

Second the signs and symptoms of androgen deficiency are not specific and they can change with age, associated diseases, severity and duration of the androgen deficiency, variation of the androgenic sensitivity and previous testosterone therapy (16). In the present study, we only recruited men who did not

have chronic diseases; however, we did not establish this matter through laboratory tests.

Moreover, the threshold of decreased testosterone level for which the adverse effects and the onset of androgenic deficiency symptoms that are associated is not known (1). Clapauch et al., found that total scores equal to or higher than 27 in the Aging Male's Symptoms Scale (AMS) questionnaire were only related to total testosterone levels below 400 ng/dL and no association was found in binding and free testosterone (17). The androgen deficiency in elderly males is normally partial and only a few of them clearly display hormonal levels under the lower limit for young and healthy males, which makes the

hypogonadism diagnosis harder in such cases (3).

Conclusion

In this study, there was a high frequency of andropause symptoms according to the ADAM questionnaire that was highly discrepant with the blood test for total and free testosterone. It seems that some symptoms may relate to other socio-economic factors, e.g. income.

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