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The Prevalence of Andropause Symptoms and the Role of Social Determinants of Health on its Severity in Healthy Men: A Community-based Study in Northwest Iran

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Abstract

Objectives: As men age, they experience changes due to reduced androgen level that is called andropause. Several factors contribute to reduced androgen levels in men. This study aimed at determining predictive factors for andropause.

Materials and Methods: This study was conducted in 2015 on 264 andropausal men living in Tabriz who were selected using cluster sampling. Data was collected from April 2015 to September 2015 using demographic questionnaires and the male andropause symptoms self-assessment questionnaire.

Results: The mean age of the participants was 58.8±6.3, and the mean male andropause symptoms self-assessment questionnaire score was 53.7±9.9. In addition, linear regression analysis showed that the variables of education, employment, satisfaction with the spouse's behavior, housing status were among the predictors of andropause symptoms.

Conclusions: According to the results, the prevalence of andropause symptoms was moderate. Some social determinants of health such as employment, education, and marital satisfaction played a role in andropause symptoms. It seems that conducting further studies on the main causes of this problem and finding practical solutions to reduce andropause symptoms is necessary for providing health care for andropausal men.

Keywords: Social determinants of health, Andropause, Men's health

Introduction

Men experience changes due to reduced androgen level as they age, which is called andropause (1,2). Andropause is a complex process; its symptoms have been identified generally in middle age and later. However, the signs and symptoms of andropause first begin quietly and stealthily without any clear clinical picture (2,3). In fact, andropause is male age-related relative hypogonadism, which, unlike menopause, is not always accompanied by symptoms (2).

Free testosterone is the most important androgen and after the age of 40, its level decreases by 1%-2% each year (2,4). Based on the reports, aging, obesity, hereditary factors, lifestyle, chronic diseases and taking certain drugs are among the most common causes of decreased testosterone levels (4-6).

In general, andropause symptoms appear in physical, psychological, and sexual dimensions and include decreasing physical strength, weight gain, irritability, depressed mood, concentration impairment, insomnia, decreased libido, and lack of orgasm (7). The prevalence of andropause is different in various parts of the world. Ichioka reported 22.7% in Japanese men (8), Araujo et al estimated that the prevalence of andropause symptoms in Spanish men was 5.6% (9), and a study by Khosravi et al on Iranian men showed that the prevalence of andropause symptoms was 51.5% and 3.5% of participants suffered from severe symptoms (10). The predictive factors of andropause are very diverse and some of the social predictors of health are among the predisposing factors of andropause. For instance, cigarette smoking and alcohol consumption exacerbate the symptoms of andropause (4,5,11) while education, employment, and a high level of socio-economic status reduce andropause symptoms (12-14).

Unlike menopause which is a well-known phenomenon, andropause remains a controversial issue. In addition, a review of research carried out on andropause showed there was a need to increase the level of knowledge about the symptoms and predisposing factors of andropause among health care providers and even among the public (15).

Although andropause is a complex issue which has several risk factors related to its development, it seems that studies about social determinants of andropause are not sufficient (16). Assessment of andropause symptoms in primary health care programs could help in early

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diagnosis and costs reduction (15).

This study was conducted to estimate the prevalence of andropause symptoms and determine the social predictors of andropause in healthy men living in Tabriz, Iran.

Materials and Methods

Study Design and Participants

This study which was a part of a cross-sectional household survey on middle-aged couples was conducted from May to September 2015 in Tabriz. Cluster sampling was used on the basis of the addresses which were randomly drawn from the last population census in 2011. A total of 50 households which included the men aged 50-70 at the time of the current study were randomly selected from the databank of Statistical Center of Iran. Each of these households was indicated as a cluster head (CH). The sampling was started from CH, researcher (first author) and two trained interviewers attended homes after explaining the purpose of the study and checking the inclusion criteria. The sampling continued on the right side of the first house to get 5 eligible individuals. In case there were no eligible households, the interviewers moved on to the next house until 5 people in each cluster were completed. All of the interviews were conducted by the first author and 2 trained interviewers. The monogamous men aged 50-70 years were included in the study. Exclusion criteria were taking any drugs that can affect libido including testosterone and sildenafil, having chronic diseases including heart disease, hypertension, diabetes, any type of cancer, prostate disease, active lung disease and current cigarette smoking.

Data Collection Tools and Assessment of Variables

The questionnaires used in this study included the socio-demographic questionnaire and the andropause symptoms self-assessment questionnaire (MASSQ). The validity and reliability of the questionnaire were determined by Asadollahi et al and the Cronbach α was reported to be 0.89 (17). This instrument consists of 25 questions that evaluate andropause symptoms.

Statistical Analysis

To analyze the data, SPSS version 20.0 was used. Based on a study by Samizadeh et al, the prevalence of andropause was 20% (5% type I error, 0.05 precision, and 10% drop out) and the sample size was estimated to be 264 using the following formula (18).

$$SS = \frac{Z^2 * p * (1-p)}{c^2}$$

The quantitative and qualitative variables are expressed as the mean ± standard deviation and frequency (percentage). In order to control for the confounding variables and assess the effect of each independent variables (demographic characteristics) on dependent variables (MASSQ), those independent variables in which their *P* values in 2 variable tests were less than 0.2 were entered into a multivariate linear regression model using backward strategy. A *P* value less than 0.05 was considered significant.

Results

Totally, 264 men were included in the analysis with the mean age of 58.8 ± 6.3 years. Among them, 50% had primary school education, 70.5% were self-employed, 21.2% had two children, 35.6% spent their leisure time with their family and friends, 97% and 80.7% were satisfied with their children's behavior and marital lives and 70.5% of participants stated that their income was almost enough to meet their daily expenses (Table 1).

Table 2 shows the prevalence of andropause symptoms in the participants. The main andropausal symptoms which were reported by participants included the following: falling asleep after dinner (89.9%), musculoskeletal pain (89%), increased need for sleep, often feeling tired (88.6%), and sleep problems (83.3%).

Mean (SD) of MASSQ score was 53.7±9.9. Additionally, 5.3% of the participants did not need testosterone therapy and only 0.4% received a score above 85 (would almost certainly benefit from testosterone replacement therapy). There was a mild correlation between age and MASSQ score (P = 0.05, r = 0.130). Linear regression analysis showed that andropause symptoms are less prevalent in

Table 1. Demographic Characteristics of Men

Variable	No. (%)
Education	
Primary/junior high school	79 (29.9)
Illiterate	132 (50)
Senior high school/college diploma	33 (12.5)
Academic education	20 (7.5)
Employment	
Self-employment	186 (70.5)
Government job	30 (11.4)
Retired	34 (12.9)
Unemployed	14 (5.3)
Satisfaction with the spouse's behavior	
Satisfied	239 (90.5)
Satisfied with their children's behavior at home	
Satisfied	239 (90.5)
Housing status	
Landlord	243 (92)
Tenant	21 (8)
Leisure time	
Religious meeting	23 (8.7)
Running/sport	97 (36.7)
Spend time with friends and relatives	94 (35.6)
Going to the park	39 (14.8)
Study	11 (4.2)
Income	
Completely sufficient	39 (14.8)
Partially sufficient	186 (70.5)
Insufficient	39 (14.8)

Table 2. The Prevalence of Andropause Symptoms According to MASSQ

Variable	No. (%)
Fall asleep after dinner	237 (89.8)
Joint and muscular pain	235 (89)
Increased need for sleep, often feeling tired	234 (88.6)
Decrease in the ability to perform sexually and the frequency of sexual activity	222 (84.1)
Sleep problems	220 (83.3)
Notice decreased enjoyment of life	214 (81.1)
Decline in feeling of general well-being	209 (79.5)
Have decreased sex drive	205 (77.7)
Decrease in sexual desire/libido	202 (76.5)
Decrease in the number of morning erections	197 (74.6)
Feeling burnt out, have hit rock-bottom	191 (72.3)
Notice a decrease in my ability to play sports	189 (71.6)
Decrease in muscular strength	186 (70.5)
Notice a lack of energy	183 (69.3)
Notice a decrease in strength and endurance	171 (64.8)
Excessive sweating	170 (64.4)
Irritability	163 (61.7)
Physical exhaustion/lacking vitality	153 (58)
Nervousness	152 (57.6)
Anxiety	140 (53)
Feeling that you have passed your peak	130 (49.2)
Decrease in beard growth	122 (46.4)
Depressive mood	99 (37.5)
Sadder/more grumpy than usual	99 (37.5)
Feel like losing height	83 (31.4)

Table 3. The Relationship between Socio-Demographic Characteristics and Andropause Symptoms in Men Based on Multivariate Linear Regression Test[a]

Variable	β (95% CI)	*P* Value
Education		
Primary/junior high school (reference)	0	0
Illiterate	-0.032 (-0.138 to 0.083)	0.621
Senior high school/college diploma	0.486 (0.127 to 0.210)	0.627
Academic education	-1.895 (-0.428 to 0.008)	0.049
Employment		
Self-employment (reference)	0	0
Government job	0.227 (-0.148 to 0.186)	0.821
Retired	3.144 (0.097 to 0.422)	0.002
Unemployed	2.131 (0.018 to 0.467)	0.034
Satisfaction with the spouse's behavior		
Satisfied (reference)	0	0
Dissatisfied	3.95 (-0.261 to 0.817)	0.062
Housing status		
Landlord (reference)	0	0
Tenant	-6.07 (-10.61 to -1.52)	0.009

[a] Adjusted R^2 = 5.8%.

the variable of "academic education" in comparison with "primary/junior high school education". In addition, they are more prevalent in the variables of "unemployed" and "retired" compared to "self-employment". Moreover, andropause symptoms are prevalent in the variable of "dissatisfied with the behavior of the spouse" (Table 3).

Discussion

This study was conducted on healthy men to identify social determinants of andropause.

The findings of the current study showed that 93.2% and 1.5% of participants suffered from moderate and severe andropause symptoms, respectively. Only 5.3% of the participants were free of andropause symptoms. There is a wide variation in the prevalence of andropause in different studies (14,19,20). For example, it is estimated that the prevalence of andropause in European males is 23.3%, in Hefei area and India is 67.7 and 67.5%, respectively (19,21,22).

In general, the discrepancy between the results of the current study and those of other studies could be due to different inclusion criteria, age range, instruments for evaluation of andropause symptoms, cultural and environmental conditions where the studies were conducted. The high prevalence of andropause seen in this study could be due to the form of the questionnaire. Generally, the symptoms of andropause are not specific and some statements in the questionnaire overlap with aging symptoms (14).

The results of the present study showed that sexual, psychosocial and somatic symptoms of andropause are among the most frequent symptoms. Moreover, sense of decrease of height, depressed mood and sadness, sense of losing abilities were less common.

The findings of the present study are almost in line with those of other studies. Maha from Kuwait and Tadayon Najafabady et al from Iran reported that loss of libido and weakness are among the five most frequent symptoms (12,20).

In the present study, a significant correlation was observed between age and scores of andropause symptoms. Researches have shown that aging is among the main predictive variables for andropause (12,14).

Further, the results showed that employment was one of the predictors of andropause symptoms, therefore, unemployed men experienced andropause symptoms more than the employed ones. This result is consistent with those of several studies conducted in Iran and in other countries (10,12-14).

Contrary to some researches, income was not among the predictors of andropause in our study (14). This difference between the results of these studies was probably because the participants in the present study were not asked about their exact income levels but rather were asked about the

sufficiency of their income levels.

In line with other studies, education was one of the predictors of andropause symptoms so the higher the level of education was the fewer andropause symptoms were experienced (12,18). It is possible that education can indirectly reduce andropause symptoms through healthy lifestyle changes including physical activity (12).

Satisfaction with spouse's behavior was another predictor of andropause, therefore, those who were dissatisfied with their spouses' behavior had more severe andropause symptoms. Generally, marital status is one of the effective factors in the emergence of andropause, it means that married men had fewer andropause symptoms (18,23,24). Furthermore, in line with our study, other studies reported that relationship with spouse and children's behavior were correlated with age-related changes experienced by men. Moreover, the correlation between depression and andropause symptoms are well-documented (10).

It is possible that men who do not have a good relationship with their wives are more likely to be drawn into a depressed mood and, consequently, have more andropause symptoms.

This study had some limitations. Using a clinical approach and MASSQ questionnaire for the assessment of andropause symptoms might be one of the limitations of this study. Using a screening instrument, estimation of the prevalence of andropause and investigation of correlation with probable risk factors without measurement of blood testosterone may be less precise. Since andropause is a sensitive issue, the participants might not have answered the questions accurately enough. However, it had strong points as it was a community-based study and used random sampling and therefore, its results could be generalized to the entire society.

Conclusions

In the present study, sexual, somatic, and psychological symptoms of andropause were identified as the most prevalent reported symptoms. The results showed that some of the social determinants of health are among the risk factors of andropause and most of the effective factors that increased the severity of andropause symptoms including education level and employment are modifiable. The high prevalence of andropause in Iranian population and its key risk factors in healthy people point out the necessity to improve the social conditions that have serious effects on the quality of life of middle-aged men.

Conflict of Interests

Authors have no conflict of interests.

Ethical Issues

The study was approved by the Ethics Committee of Tabriz University of Medical Sciences (ethical code 5/4/9866). Before data collection, written informed consents were obtained from all participants.

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