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Original Research / Özgün Araştırma

Effect Of Metabolic Syndrome-Related Parameters On Overactive Bladder

Metabolik Sendrom İlişkili Parametrelerin Aşiri Aktif Mesane Üzerine Etkisi

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Özet

Amaç: Aşırı aktif mesane (AAM) ani sıkışma ile karakterize ve yaşam kalitesini olumsuz etkileyen bir durumdur. Yaş, obezite, parite, diabetes mellitus (DM), hiperlipidemi gibi durumların AAM ile ilişkisi olduğu gösterilmiştir. Bu çalışmada aile hekimliği polikliniğine ürolojik semptomlar dışında başvuran hastaların boy, kilo, bel ve kalça çevresi, beden kütle endeksi gibi demografik verileri ile birlikte glukoz, kolesterol, hemoglobin gibi laboratuar verilerinin AAM ile ilişkisi araştırılmıştır.

Gereç ve Yöntemler: Aile hekimliği polikliniğine başvuran 100 kadın hastanın yaş, boy, kg, beden kütle endeksi(BMI), bel/kalça oranı, bel/boy oranı gibi demografik verileri ile birlikte, kan glukoz, kolesterol, trigliserit (TG), Hemoglobin, TSH, Vit D3, Vit B12 gibi laboratuar değerlerinin bu hastalara doldurulan AAM semptom skoru (OAB-V8) anketinin sonuçları ile karşılaştırıldı ve etkisi değerlendirildi.

Bulgular: Hastaların OAB-V8 semptom skorunu; yaş, kg, BMI, Bel çevresi, Bel/kalça oranı, bel/boy oranı ve total kolesterol değerleri ile arasında korelasyon olduğu tespit edildi. Total kolesterol yüksekliği, birden çok kronik hastalık varlığı, hemoglobinin 12'den yüksek olması ve santral tip obezitenin aşırı aktif mesane semptom skoru anket puanını artırdığı saptandı**.**

Sonuç: Aşırı aktif mesane multifaktöriyel bir hastalık olup yaş, santral tip obezite ve birden fazla kronik hastalık varlığı AAM semptomları üzerinde etkili olabilir**.**

Anahtar Kelimeler: Aşırı aktif mesane, obezite, yaş, OAB-V8 soruları, diabetes mellitus, hiperlipidemi.

Abstract

Objective: Over active bladder (OAB) is a situation characterized by urgency which negatively affects quality of life. Associations have been shown between situations like age, obesity, parity, DM and hyperlipidemia with OAB. In this study, patients attending a family practice clinic without urologic symptoms had demographic and laboratory data researched for correlation with OAB.

Material and Methods: A total of 100 female patients attending a family practice clinic had demographic features like age, height, weight, BMI, waist/hip ratio, and waist/height ratio and laboratory values like blood glucose, cholesterol, TG, hemoglobin, TSH, vitamin D3 and vitamin B12 compared for their effect on the OAB-V8 survey.

Results: The OAB-V8 symptom score of patients was identified to have correlations with age, weight, BMI, waist circumference, waist-hip ratio, waist-height ratio and total cholesterol levels. Elevated total cholesterol, presence of more than one chronic disease, hemoglobin above 12 and central-type obesity were identified to increase OAB-V8 symptom score.

Conclusion: OAB is a multifactorial disease and age, central-type obesity and more than one chronic disease may affect OAB symptoms.

Keywords: Overactive bladder, Obesity, Age, OAB-V8 questionare, Diabetes Mellitus, Hyperlipidemi.

INTRODUCTION

The International Continence Society (ICS) defines overactive bladder (OAB) generally as sudden feelings of urgency accompanied by urine leak or not, increased frequency of urination and frequent urination at night. (1,2) These symptoms negatively affect quality of life. (3) According to this definition of ICS, OAB prevalence was detected as 12.2-24.7% in the society. (4) OAB prevalence was reported between 11.8 and 16.9 in Turkey. In a current study, urgency symptom was reported as 29.3% in Western Turkey (5).

Studies have shown that demographic features like age, obesity and parity (6) and laboratory parameters like diabetes mellitus (DM) and hyperlipidemia(7-8) are associated with OAB. A strong relation was detected especially between obesity and OAB(9,10) but there is no study on obesity type in literature.

Since OAB diagnosis is generally based on subjective symptoms, results reported by the patient are regarded to be very important for the evaluation and treatment of OAB patients and many surveys were formed to objectively measure these subjective symptoms.(11) The overactive bladder symptoms score (OAB-V8) is a short and powerful survey used to assess OAB symptoms and effect on quality of life.

In this study, we planned to assess the correlation of obesity type and laboratory parameters with OAB for female patients attending a family practice for reasons other than urologic symptoms.

MATERIAL AND METHODS

A total of 100 female patients over the age of 30 years attending the family practice for complaints other than urologic symptoms completed the overactive bladder symptom score-version 8 (OAB-V8) form. Patients had demographic data like body weight, number of pregnancies and births, presence of chronic disease, height, waist and hip circumference measurements, body mass index (BMI), waist/hip (W/H) and waist/height (W/HT) ratio recorded.

Total cholesterol (T. chol), triglyceride (TG), LDL cholesterol, HDL cholesterol, hemoglobin, vitamin D, blood glucose levels, TSH, and vitamin B12 values were investigated. As OAB symptoms are more common in postmenopausal and climacterium periods in women, the ages below and above 45 which is the average menopause age were compared in this study.

Additionally, the patient population was divided into subgroups according to age (<45-≥45), total cholesterol levels (<200 - ≥200), fasting blood glucose level (<100- ≥100), serum hemoglobin level (<12- ≥12), BMI (<30-≥30), W/H ratio (<0.85, ≥0.85), W/HT ratio (<0.5, ≥0.5), known presence of DM and presence of chronic diseases.

Demographic and laboratory parameters were compared with OAB-V8 survey results. Additionally, subgroups were analyzed and assessed.

Statistical Analysis

Statistical analysis was performed using SPSS v. 23.0 statistical software (SPSS Inc., Armonk, NY, United States). $\chi 2$ was used to determine whether the distributions of categorical variables differed between groups. Categorical variables are described as frequencies and percentages. Continuous variables are presented as mean and standard deviations. Independent T test and Kruskal Wallis test were used to compare continuous variables between groups. Chi-Square ($\chi 2$) tests were used to compare quantitative variables between subgroups. Pearson's correlation coefficients were calculated for continuous variables and a P value < 0.05 was considered statistically significant.

Power Analysis

"First, power analysis was conducted with the acquired definitive measurements to determine the size of the ideal sampling for the study. The effect size in the power analysis conducted according to OAB-V8 score, definitive measurements was calculated as d=0.80. The sample size was calculated as 39 for both groups when the error level was determined to be 5% and the power value 95%. The number of patient populations has reached a minimum of thirty-nine for each subgroup. The study was completed with this sampling because 100 patients were reached during the study period."

RESULTS

Mean age of patients was 45.75±12.04 years, body weight 79.94±18.7 kg, height 161.27±5.31 cm, BMI 30.71±6.86, waist circumference 87.31±18.09 cm,

hip circumference 105.12±17.46 cm, waist/hip ratio 0.83±0.15 and waist/height ratio 0.54±0.11.

Laboratory analyses identified mean total cholesterol as 201.57±37.49 mg/dL, triglyceride 152±81.86 mg/dL, LDL cholesterol 121.20±31.11 mg/dL, and glucose levels 98.57±21.43 mg/dL. Hemogram analysis measured mean hemoglobin as 13.20±1.09 g/dL. Results are shown in Table 1.

This study identified correlations between the OAB-V8 form scores with age, weight, BMI, total cholesterol level, waist circumference, waist-hip ratio and waist-height ratio (p:0.001/p:0.004/p:0.004/p:0.021/p:0.004/p:0.013/p:0.003 respectively) (Table 2).

When analyzing patients, they were divided into groups according to age (<45-≥45), total cholesterol levels (<200 - ≥200), fasting blood glucose level (<100-≥100), serum hemoglobin level (<12- ≥12), BMI (<30-≥30), W/H ratio (<0.85, ≥0.85), W/HT ratio (<0.5, ≥0.5), known presence of DM and presence of chronic diseases and the effects on the OAB-V8 form were researched.

Subgroup analyses found those with age over 45 years had significantly high OAB-V8 score (p:0.005). Similarly, those with total cholesterol level above 200 were observed to have significantly high OAB- V8 score (p:0.011). Patients without anemia with hemoglobin levels Hb≥12 were identified to have significantly high OAB-V8 score (p<0.005). The OAB-V8 score was identified to be significantly high in the presence of chronic disease (p<0.001). However, in the presence of known DM, OAB-V8 score was not affected, though it was affected by the presence of multiple chronic diseases (p<0.05) (Table 3).

Table 1. Demographic and laboratuary datas

Group	Mean value ±SD
OAB-V8 Symptom Score	7,74 ±5,60
Age	45,75 ±12,04
Gravidity	3,75 ±1,67
Parity	2,91 ±1,05
Kg	79,94 ±18,70
Height(cm)	161,27 ± 5,31
BMI(kg/cm^2)	30,71 ±6,86
Waist circumference(cm)	87,31 ±18,09
Hip circumference(cm)	105,12 ±17,46
Waist/Hip rate	0,83 ±0,15
Waist/Height rate	0,54 ±0,11
Total Cholesterol (mg/dL)	201,57 ±37,49
Triglyceride (mg/dL)	152,91 ±81,86
LDL-Cholesterol (mg/dL)	121,20 ±31,11
HDL- Cholesterol (mg/dL)	49,06 ±9,94
Hemoglobin (g/dL)	13,20±1,09
Glucose (mg/dL)	98,57±21,43
TSH (mU/L)	2,21±1,70
Vitamin-D3 (ug/L)	11,36±11,79
Vitamin-B12 (ng/L)	340 ±237,28

Table 2. OAB-V8 score and subgroup analyses

Groups		Mean OAB-V8	P value
Age	<45 (n:55)	6,33±4,84	0,004
	≥45 (n:45)	9,51±6,03	
Total Cholesterol	200 (n:55)	6,25±4,95	0,010
	200 (n:45)	9,06±5,85	
Blood Glucose	100 (n:55)	6,99±4,89	0,061
	100 (n:45)	9,17±6,59	
Hemoglobin	<12 (n:55)	5,0±3,52	0,000
	≥12 (n:45)	8,62±5,87	
M presence	No (n:59)	7,80±5,86	0,790
	Yes (n:41)	7,47±4,40	
ronic disease presence	No (n:59)	6,37±4,83	0,003
	Yes (n:41)	9,69±6,08	
BMI	<30 (n:55)	6,22±4,02	0,008
	≥30 (n:45)	9,07±6,44	
Waist ircumference	<90 (n:55)	6,61±4,49	0,015
	≥90 (n:45)	9,33±6,61	
Waist/Hip Rate	0,85 (n:55)	6,51±3,95	0,002
	0,85 (n:45)	9,97±7,32	
Waist/Height Rate	0,5 (n:55)	5,72±3,38	0,001
	0,5 (n:45)	9,03±6,34	

Table 3. OAB-V8 score and correlations

Correlation	Age	Kg	Ml	Cholestrol	Waist ircumference	Waist/Hip Rate	Waist/Height Rate
OAB-V8 Score	0,001	0,004	0,004	0,021	0,004	0,013	0,003

DISCUSSION

OAB is very common in the population. It is estimated to be present in 12-17% of the population in developed western countries. (13-14) Current epidemiologic studies have identified similar rates in east Asia to developed western countries for OAB, while differently, patients were identified to have low rates of attendance with doctors for this complaint. (15-18)

Overactive bladder (OAB) is characterized by urinary urgency especially in situations without infection or other clear pathologic status. (1) OAB is a situation affecting the physical, social and psychological health and quality of life (QoL) of millions of people around the world. (19,20) The OAB-V8 survey is a powerful and reliable tool to assess the symptoms and quality of life of patients. (12,21) In this study, the symptom and QoL of patients were assessed with the OAB-V8 survey.

The etiology of OAB has been shown to be associated with age, obesity, DM, cardiac disorders, pelvic organ prolapse, parity and drug use. (6,13,22-24) In this study, the OAB-V8 score was compared with age, weight, height, BMI, hip circumference, waist circum-

ference, waist/hip ratio, waist/height ratio, presence of chronic disease, blood glucose, cholesterol and triglyceride values, hemoglobin value, vitamin D and B12 levels and TSH values.

In the literature, there are many studies showing OAB symptoms increase with age. (6,13,14,22) Palma et al. showed the OAB prevalence increased especially at 40-50 years. (22) Liu et al. reported women over 50 years of age had OAB rates 2.4 times higher. (23) Stewart et al. identified urge incontinence with OAB in women aged 65-74 years was nine times greater than women aged 18-24 years. (13) In this study, the OAB-V8 score was observed to increase with age. The mean OAB-V8 score below 45 years was 6.33, while above 45 years it was 9.51 and there was a significant difference ($p<0.005$).

One of the most significant known risk factors for OAB is obesity. (25) In the literature, BMI is used as a measure of obesity and correlations were shown between BMI and OAB symptoms. Stewart et al. identified the prevalence of OAB was 2.2 times greater for patients with BMI >30 compared to patients with BMI <24. (13) Palma et al. compared the correlation with OAB symptom score and BMI and showed that those with BMI >30 had significantly higher OAB-V8 survey scores compared to those with BMI 18.5-24.9. They emphasized there was a strong correlation between OAB and obesity.

(26) Wen et al. in a more current study reported that DM patients with BMI ≥25 had more OAB complaints compared to patients with BMI <25 and additionally, independent of DM, obese people with BMI >29 had more frequent OAB complaints. (25) Consistent with the literature, in this study those with BMI ≥30 had significantly high OAB-V8 score. Generally, obesity was observed to have a significant effect on OAB.

BMI is related to the total fat tissue in the body but does not provide information about the fat distribution in the body and obesity type. (27) As a result, the combined use of waist circumference, waist/hip ratio and waist/height ratio show obesity type better. (27) Lai et al. reported that central- type obesity increased bladder pressure linked to the increase in abdominal pressure and as a result strained the pelvic floor and caused urine entry into the proximal urethra leading to prolapse, urethral hypermobility and OAB symptoms in women. (28) In this study, the effects of waist circumference, hip circumference, waist/hip ratio and waist/height ratio on OAB-V8 were assessed in patients.

Lee et al. (29) showed that central obesity increased lower urinary tract symptom (LUTS) complaints. Lai et al. (28) similarly reported central obesity in women increased urinary incontinence (UI) and OAB symptoms. However, in both studies, central obesity was assessed with waist circumference. (28,29) In this study, the more objective marker for central obesity of waist/hip ratio ≥0.85 and waist/height ratio ≥0.5 were used and with these ratios, OAB-V8 score was significantly high in accordance with the literature.

The effect of hyperlipidemia on OAB is controversial in the literature. Experimental studies in hypercholesterolemic rats showed that hyperlipidemia increased OAB symptoms. (30) Additionally, a clinical study by Garnica et al. stated that hyperlipidemia alone had no effect. (7) However, Yeniel et al. reported atherosclerosis increased OAB symptoms. (8) In this study, we identified high total cholesterol levels increased OAB-V8 symptoms scores. However, there was no correlation identified for triglyceride, LDL and HDL levels.

In short, OAB is a multifactorial situation, with many effective causes. Age, central-type obesity, hyperlipidemia, and presence of more than one chronic disease may be listed among these factors. Determination of risk factors for OAB diagnosis and treatment, especially noting central-type obesity, leads to consideration that lifestyle changes with behavioral treatments like weight loss and exercise may be effective. It should not be forgotten that lifestyle changes and weight loss will improve control of accompanying chronic diseases and we think the combined effect will reduce OAB symptoms. Limited number of patients in a small area was among the limitations of this study.

CONCLUSION

OAB is a multifactorial situation. However, age, central-type obesity and hypercholesterolemia have an important place among OAB risk factors. The obesity type and presence of more than one chronic disease are significant for OAB.

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