Prevalence of Depression and Malnutrition in Geriatric Patients with and without Diabetes Mellitus

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ABSTRACT

The elderly population is increasing both worldwide and in Turkey. Malnutrition and depression are important health problems in our aging world. The purpose of this study was to determine the prevalence of depression, malnutrition, and polypharmacy in geriatric patients with and without diabetes.

A total of 253 patients, 143 with and 110 without diabetes, who admitted to the geriatric clinic, were included in the study. The weight and standing height of each participant was recorded, and their body mass index (BMI) values were calculated. Individuals with BMI values ≥ 25 kg/m² were regarded as overweight, those with BMI ≥ 30 kg/m² as obese, and those with BMI ≥ 40 kg/m² as morbidly obese. Yesavage Geriatric Depression Scale was used to assess the mood, and the Mini Nutritional Assessment-Short Form was used to assess the nutritional status.

There was no significant difference between the groups in terms of depressive symptoms (p=0.610). However, the frequency of obesity and polypharmacy was statistically significantly higher in diabetic patients (p<0.05). The proportion of those with malnutrition or risk of malnutrition was higher in patients without DM (p=0.004).

Approximately one-third of diabetic geriatric patients admitted to our clinic were overweight, while more than half were obese or morbidly obese. Malnutrition or risk of malnutrition was present in nearly half of the patients without diabetes. The presence of depressive symptoms in approximately one in two geriatric patients with and without diabetes is an issue requiring attention in terms of public health.

Keywords: Elderly, diabetes mellitus, obesity, depression, malnutrition

Introduction

During the aging process, chronic diseases increase in numbers and frequency, the metabolism slows, fat-free muscle mass decreases, and fat mass increases (1). An increase in the prevalence of obesity has become a worldwide major health problem in older adults (2). Obesity is also a health problem frequently seen in diabetic patients (3). Patients with diabetes mellitus (DM) aged over 65 constitute approximately 40% of all people with DM (4).

Polypharmacy is most commonly defined in the medical literature as taking 5 or more medications per day. Compared to those without DM, the rate of developing geriatric syndromes, especially polypharmacy, is significantly higher in older adults with DM (5).

Depression is the most frequently observed psychiatric disorder in the elderly (6). Accompanying chronic diseases, dementia-like cognitive disorder, low social support, and difficulty in accessing health services make the diagnosis and treatment of depression problematic in the elderly. Depression in the elderly impairs the individual's quality of life and can result in death by suicide (7). DM is a chronic disease with psychiatric and psychosocial dimensions, and physical, emotional, and social problems can also be observed in diabetic patients (8). The prevalence of clinical depressive symptoms in diabetic patients is approximately 40% (9). Anxiety and depression are also more frequently seen as the duration of DM increases (10).

A common geriatric syndrome observed in the elderly is malnutrition. Diabetic elderly individuals tend to low body weight, especially those living in care homes. Early detection and treatment planning of malnutrition are essential in terms of reducing morbidity and mortality (11). Malnutrition and malnutrition risk in the elderly should be determined by evaluating the nutritional status. Prolonged malnutrition accelerates aging (12). The purpose of this study was to determine the prevalence of depression, malnutrition, and polypharmacy in geriatric patients with and without DM.

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Materials and Methods

The files and hospital electronic record data for 143 geriatric patients diagnosed with DM and 110 geriatric patients without DM in our center within a one-year period (1 January 2019, to 1 January 2020) were examined. Patients were weighed and measured, and their body mass index (BMI) values were calculated. Individuals with BMI values ≥25 kg/m² were regarded as overweight, those with BMI ≥30 kg/m² as obese, and those with BMI ≥40 kg/m² as morbidly obese.

Yesavage Geriatric Depression Scale (YGDS): The YGDS was developed by Yesavage et al. to investigate the presence of depression in the geriatric population. Positive responses to various questions are coded as 0, and negative responses are coded as 1, although some questions are reverse scored. The total score expresses the 'depression score.' Fourteen or more depressive responses on the 30-question long-form are suggestive of depression. The GDS-short form has been validated in Turkey. Scores of 5 or more in this version may be compatible with depression and should be evaluated together with the patient's clinical status (13).

Mini Nutritional Assessment: The nutritional status of the patients was assessed using the MNA-SF. The MNA test was designed for the elderly population and patients under clinical follow-up. The short form, consisting of six screening questions, which is easily applied and gives rapid results, was applied in this study. MNA scores of ≤7 are interpreted as malnutrition, 8-11 as malnutrition risk, and ≥ 12 as normal nutritional status (14).

Statistical Analysis: The data obtained from the questionnaires were entered into SPSS 20.0 (Statistical Package for Social Sciences) software. The variables were analyzed for their distribution normality using the Kolmogorov–Smirnov and Shapiro Wilk test. Descriptive statistics were given for continuous variables. Categorical variables of groups were assessed by the chi-square test. Continuous variables of groups were assessed by using the independent sample t-test. The data were expressed as mean ± standard deviation (S.D.). A p-value of <0.05 was considered statistically significant.

Ethics: Ethics Committee Approval: Approval was obtained from Gaziantep University Local Ethics Committee (2016/296).

Results

Two hundred fifty-three patients admitted to the geriatric medicine clinic were included in the study. The mean age of the patients was 70.82±5.67 and 59.7% were female. Most of the patients were in the 65-74 age group.

Participants were evaluated in two groups, 143 with DM and 110 without DM. There was no significant difference between the groups in terms of age, gender, marital status, education, living arrangements (alone or with family), smoking status, alcohol use, and doing regular exercise (p>0.05). However, the prevalence of obesity and polypharmacy was significantly higher in the diabetic group (p<0.05). There was no significant difference between the groups in terms of depressive symptoms (p=0.610).

The proportion of those with malnutrition or risk of malnutrition was higher in patients without DM (p=0.004). The results of the MNA-SF revealed a risk of malnutrition rate of 40% and a malnutrition rate of 8.2% in patients without DM, and a risk of malnutrition rate of 22.4%, and a malnutrition rate of 7.7 % in patients with DM. Patients' demographic characteristics and detailed geriatric examination results are summarized in Table 1.

According to the nutritional status of the patients, there was no difference in age groups, gender, and proportion of the patients with depressive symptoms, while there was a significant difference between patients with and without DM (Table 2).

While a statistically significant negative weak correlation was found between YGDS and MNA-SF, a statistically significant positive weak correlation was found between MNA-SF and BMI. In addition, there was a statistically significant positive weak correlation between the number of medications used and BMI and YGDS (Table 3).

Discussion

The prevalence of DM and obesity are increasing both in Turkey and worldwide. Obesity in Turkey exhibits a marked increase with age in both women and men. In the present study, 32.9% of diabetic patients were overweight, and 51.7% were obese or morbidly obese, while only 36.4% of the patients without DM were obese. These figures are considerably higher than global general obesity rates based on World Health Organisation (WHO) data (15). Similar to the present research, a recent study of 4648 type 2 DM patients in Turkey reported an obesity rate of 59% (16). The most important reason for this increase in the

Table 1. Demographic Characteristics and Detailed Geriatric Evaluation Results of The Patients

	Patients with diabetes n=143 (%)	Patients without diabetes n=110 (%)	p
Gender (Female)	85 (59.4%)	66 (60%)	0.580
Age (years)	70.3±4.76	71.6±6.52	0.063
Age group			
65-74 years	118 (82.5%)	75 (69.4%)	
75-84 years	22 (15.4%)	26 (24.1%)	0.034*
≥85 years	3 (2.1%)	7 (6.5%)	
BMI (kg/m2)	30.9±5.5	28.9±6.2	0.010*
Frequency of obesity	74 (51.7%)	40 (36.4%)	0.004*
Education level			
Uneducated	74(51.7%)	58(52.7%)	
Elementary school	45(31.5%)	3(29.09%)	
Middle school	7(4.9%)	6(5.45%)	0.401
High school	12(8.4%)	5(4.54%)	
University	5(3.5%)	9(8.18%)	
Marital status			
Married	109(76.2%)	81(73.6%)	0.490
Other	34(23.8%)	29(26.4%)	
Living arrangements			
With family	128(89.5%)	99(90%)	0.551
Alone	15(10.5%)	11(10%)	
Depressive symptoms (YGDS≥5)	65(45.5%)	46(41.8%)	0.610
Malnutrition or risk of malnutrition (%)	43 (30.1%)	53 (48.2%)	0.004*
Number of medications	5.30±2.80	3.77±2.70	0.000*
Smoking(+)	28(19.6%)	20(18.8%)	0.872
Alcohol(+)	6(4.2%)	3(2.7%)	0.532
Regular exercise	24(16.8%)	21(19%)	0.740

*Significant at p<0.05

prevalence of obesity in the elderly may be a marked decrease in basal metabolism rates and physical activity. High frequencies of overweight and obese individuals were found in the present study, particularly among the diabetic elderly. In support of the findings of the present research, studies have reported obesity in up to 80% of type 2 diabetics (17). We think that high carbohydrate intake habits among diabetic patients due to non-adherence to diet and a sedentary lifestyle contributed to the rates in this study.

Depression or depressive symptoms are commonly seen in the geriatric era. Patients with DM and without DM had a 45.5% and 41.8% risk of depression, respectively, higher than the community average. Due to the high rates of depression in both groups in the present study, we were unable to observe the effect of DM on depression risk. In parallel to the present study, Bahat et al. determined a 45.5% rate of depression in 515 geriatric women using the GDS. Depression was also one of the three most common diagnoses in that study (18). Another study reported depression in 41.1% of 274 older men (19). In another study from Turkey, GDS revealed depression in 21.8% of 1255 elderly subjects (20). Almawi et al. determined a higher risk of depression and anxiety in patients with long-term DM (21). Another study found that anxiety and depression rates increased in line with DM-related complications (10).

Table 2. Comparison of The Patients According To The Nutritional Status

	Nutritional Status			
	Normal Nutritional Status	Malnutrition Risk	Malnutrition	p
Gender				
Female	85 (54.1%)	41 (53.9%)	14 (70.0)	0.389
Male	72 (45.9%)	35 (43.1%)	6 (30.0%)	
Age group				
65-74 years	126 (81.3%)	55 (72.4%)	12 (60.0%)	
75-84 years	25 (16.1%)	16 (21.1%)	7 (35.0%)	0.139
≥85 years	4 (2.6%)	5 (6.6%)	1 (5.0%)	
Depressive symptoms (YGDS≥5)	65 (41.4%)	34 (44.7%)	12 (60%)	0.283
Diabetes Mellitus	100 (63.7%)	32 (42.1%)	11 (55%)	0.008*

*Significant at $p<0.05$

Table 3. Correlation analysis results between number of medications, BMI, MNA-SF, and YGDS

		Number of medications	BMI	MNA-SF	YGDS
Number of medications	r	1,000	0,164	0,078	0,218
	p		0,022*	0,247	0,001*
BMI	r	0,164 0,022*	1,000	0,251	0,124
	p			0,000*	0,067
MNA-SF	r	0,078 0,247	0,251	1,000	-0,146
	p		0,000*		0,020*
YGDS	r	0,218 0,001*	0,124	-0,146	1,000
	p		0,067	0,020*	

r: Spearman correlation co-efficent; *:Significant at $p<0.05$. BMI, Body mass index (kg/m²); MNA-SF, Mini nutritional assessment short form; YGDS, Yesevage Geriatric depression scale

The incidence of malnutrition among geriatric patients ranges between 11% and 44%, rising as high as 60% among hospitalized patients (22). In the present study, the risk of malnutrition was significantly higher in patients without DM. The risk of malnutrition in these patients was 40%, with an actual malnutrition rate of 8.2%. We think that the high malnutrition risk in patients without DM may arise from accompanying diseases, multiple drug use, and psychosocial problems. Besides, one in every three diabetic geriatric individuals was at risk of malnutrition. It may be concluded that compared to the patients without DM, the diabetic patients in the present study received more health services due to chronic disease, received more checks, and were thus more conscious of the risks of malnutrition. Also, polyphagia seen in hyperglycemia or fright of hypoglycemia may be protective against malnutrition. Although obesity is a critical problem in elderly diabetic individuals, the risk of malnutrition in particular due to poor nutrition is also increasing and requires advanced evaluation. Dietary restrictions must be avoided in the presence of malnutrition in this group, and adequate and balanced nutrition must be applied (23). In a study of 3061 patients, Almeida et al. found a malnutrition risk rate of 39.3% (24). In a study from Turkey, Ülger et al. reported a malnutrition risk rate of 28% among 2327 geriatric patients presenting to their clinic (25).

In this study, a significant weak negative correlation was found between MNA-SF and YGDS scores. A study stated that malnourished elderly patients are at greater risk for depression, and the coexistence of the two conditions facilitates adverse effects (26). Therefore, a vicious

circle between malnutrition and depression can occur in elderly patients.

There are several limitations to this study. First, there is a lack of data on glycemic control and insulin use in patients with DM. Second, it has a cross-sectional structure and a relatively low number of patients. Further large-scale, randomized, and prospective studies are needed to raise the significance of our findings.

Approximately one in three of the geriatric patients diagnosed with DM in the present study were overweight, and more than half were obese or morbidly obese. The risk of malnutrition or malnutrition was present in almost half of the geriatric patients without DM. The fact that depressive symptoms were observed in approximately one in every two geriatric patients with and without DM is a point requiring careful attention in terms of public health. It is essential for nutritional status to be accurately assessed in geriatric care, in terms of both obesity and malnutrition. Depressive symptoms in geriatric individuals must not be regarded as a natural consequence of aging and require careful investigation. It is important to initiate effective and appropriate medical treatment when geriatric depression is identified.

Conflict of interest statement: None.

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