

Temperament and Character Traits of The Patients with Type 2 Diabetes

Elif Biter¹, Erman Bagcioglu², Bulent Bahceci³, Ali Ozer⁴, Mesut Ozkaya⁵, Mehmet Fatih Karaaslan¹

ÖZET:

Tip 2 diyabet hastalarında mizaç ve karakter

Amaç: Bu çalışmadaki amaç tip 2 diyabet hastalarında mizaç ve karakter boyutundaki farklılıkları değerlendirmektir.

Yöntem: Mizaç ve Karakter Envanteri, Montgomery-Asberg Depresyon Değerlendirme Ölçeği, Hamilton anksiyete Ölçeği tip 2 diyabet hastalarına ve kontrol grubuna uygulandı.

Bulgular: Anksiyete ve depresyon skoru diabetli hastalarda anlamlı olarak yüksekti ($p=0.0001$ ve $p=0.009$, sırasıyla). Mizaç ve Karakter envanterine göre, zarardan kaçınma-çabuk yorulma ve dermansızlık, kendini yönetme-beceriklilik, işbirliği yapma-yardımsızlık skorları hasta grubunda anlamlı olarak yüksekti ($p=0.001$, $p=0.004$, $p=0.040$, sırasıyla).

Sonuç: Bizim arařtırmamızda tip 2 diyabet hastalarının anksiyete ve depresyon skorlarının kontrol grubundan anlamlı olarak yüksek olduğu ve mizaç ve karakter envanterine göre de çabuk yorulma ve dermansızlık, beceriklilik, yardımsızlık alt gruplarında her iki grup arasında farklılıklar bulunmuştur.

Anahtar sözcükler: tip 2 diyabet, mizaç, karakter

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ABSTRACT:

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Objective: The aim of this study was to evaluate the differences among dimensions of temperament and character within type 2 diabetes patients.

Methods: Temperament and character inventory, Montgomery-Asberg Depression Rating Scale, Hamilton Anxiety Rating Scale were administered to type 2 diabetes patients and control groups.

Results: Anxiety and depression scores were significantly higher in patients with type 2 diabetes ($p=0.0001$ and $p=0.009$, respectively). According to inventory, the scores of harm avoidance-fatigability, self directedness-resourcefulness, and cooperativeness-helpfulness of patients were significantly different from controls ($p=0.001$, $p=0.004$ and $p=0.040$, respectively).

Conclusions: Our research findings indicate that the patients with type 2 diabetes differ from the control group members in terms of higher levels of anxiety and depression as well as the temperament and character traits of fatigability, resourcefulness and helpfulness.

Key words: type 2 diabetes, temperament, character

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¹MD, Departments of Psychiatry, Medical Faculty, Kahramanmaraş-Turkey
²MD Departments of Psychiatry, Education and Research Hospital, Erzurum-Turkey
³MD, Departments of Psychiatry, Education and Research Hospital, Rize-Turkey
⁴MD, Department of Public health, Faculty of Medicine, Malatya-Turkey
⁵MD, Department of Endocrinology, Faculty of Medicine, Kahramanmaraş-Turkey

Yazışma Adresi / Address reprint requests to: Erman Bagcioglu, MD, Education And Research Hospital, Erzurum-Turkey

Elektronik posta adresi / E-mail address: ermanbagcioglu@yahoo.com

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INTRODUCTION

Diabetes mellitus (DM), is a somatic illness which has psychobiological and psychosocial dimensions (1,2). DM, which has an approximate prevalence of 7.2 % in Turkey, has both growing in prevalence and importance (3).

The relationship between psychiatric and endocrinological illnesses is important because of the shared biological background. Blood glucose level and its dysregulation directly affect brain and mental functions and conversely blood glucose is affected from both mental and emotional changes (4). Many studies reported that DM is seen in high comorbidity in psychiatric disorders (5,6). It is generally believed that psychiatric illness can adversely

affect blood glucose regulation either through neuroendocrine pathways or by disrupting the behaviors necessary for diabetic self-care (7). However, it was observed that psychiatric diagnosis did not correctly predict diabetes control (8). Thus, researchers focused on the relationship between personality traits and glucose regulation. In Stabler et al.'s study, patients with insulin dependent DM were divided into two groups as type A and type B according to their behavior patterns and it was found that only type A subjects showed hyperglycemic response to stress (9). Graue et al. found, in the study of 103 adolescents with diabetes, that greater use of active coping was related to better HbA1c and higher diabetes life satisfaction (10). Lane et al. reported that there were

positive relationships between higher neuroticism and good glycemic control and between higher altruism and poor glycemic control (11). Grylli et al. investigated the relationship of eating disorder, glycemic control, depression, and temperament and character inventory in adults with type 1 diabetes. This was the first study using Cloninger's personality model in adult type 1 diabetes patients. This study led to further studies because it detected a difference in the personality characteristics of type 1 diabetics that develop eating disorder or not (12). In a study, using Cloninger's earlier version of TCI, it was found that diabetic patients with opportunistic personality features had poor metabolic control and this patient group consisted of people who can't delay satisfaction (13). Finally, we thought that the studies investigating the personality traits in patients with diabetes are important because they help us understand the pathogenesis of diabetes and effective management of glucose levels better.

Thus, we aimed to investigate the personality structure of patients with diabetes mellitus via a new psychobiological inventory, the temperament and character inventory (TCI) developed by Cloninger 1987 (13). Theoretical model of Cloninger based psychobiological model of personality, assume that personality can be dissected into temperament and character and interaction between temperament and character. Temperament dimensions are hypothesized to be determined genetically and inherent features that do not change throughout an individual's life span. Character dimensions are postulated to be determined mostly by environment.

MATERIALS AND METHODS

Our study elected naturalistically 50 type 2 diabetes patients who applied to outpatient clinics of endocrinology at the Medical School of Kahramanmaraş Sutcuimam University between the years of 2007-2010. The participants were selected in a naturalistic manner. Inclusion criteria were based on being within 18-65 age group, having type 2 diabetes and being able to fill in questionnaires by oneself. Exclusion criteria were as follows: using any psychotropic medication, comorbid diabetes by a chronic illnesses (i.e other endocrine diseases, neurological disorder, systemic diseases, chronic obstructive pulmonary disease, arthritis), and

diabetes-related complications including proliferative retinopathy, neuropathy and microalbuminuria. Control group was consisted of 50 healthy volunteers working as staff in the hospital or people who applied to the hospital for check up. The participants gave written informed consent confirming participation. The subjects presented to the Endocrinology Unit after an overnight fast. A fasting venous blood sample was taken between 8:00 and 9:00 a.m. Each participant attended a second laboratory session and provided a second blood sample for postprandial blood glucose, HgA1c, urea and creatinine. Heights and weights were measured by the clinic staff. BMI was calculated as body weight (kg) divided by the square of the height (m²) (kg/m²). Temperament and character inventory (TCI), Montgomery-Asberg Depression Rating Scale (MADS), Hamilton Anxiety Rating Scale (HAM-A) were administered to both study and control group members and the participants with incomplete results were excluded.

Temperament and Character Inventory (TCI): This inventory, consisting of 240 yes/no questions was introduced by Cloninger as Tridimensional Personality Questionnaire (14). Having its origins in biopsychosocial model, the inventory is further developed by Cloninger. In 1991 three character and one personality feature was added making the inventory seven dimensional and its name was changed as Temperament and Character Inventory (15) According to temperament dimensions: novelty seeking (NS) has four subscales (NS1: exploratory excitability; NS2: impulsivity; NS3: extravagance; NS4: disorderliness); harm avoidance (HA) has four subscales (HA1: anticipatory worry; HA2: fear of uncertainty; HA3: shyness; HA4: fatigability); and reward dependence (RD) has three subscales (RD1: sentimentality; RD3: attachment; RD4: dependence) and persistence (P). According to character dimensions; self directedness has five subscales (SD1: responsibility; SD2: purposefulness; SD3: resourcefulness; SD4: self acceptance; SD5: congruent second nature), cooperativeness has 5 subscales (CO1: social acceptance; CO2: empathy; CO3: helpfulness; CO4: compassion; CO5: principled) and self transcendence has 3 subscales (ST1: self forgetfulness; ST2: transpersonal identification; ST3: spiritual acceptance). The validity and reliability study of Turkish version was made by Kose et al. (16).

Table 1: Metabolic parameters of patients and controls

	Patients	Controls	p
BMI	30.22±6.93	26.50±4.18	0.002*
FPG (mg/dl)	182.98±88.43	84.30±9.03	<0.001
PPG (mg/dl)	260.30±156.79	137.98±15.68	<0.001
HbA1c	7.72±2.27	5.02±0.49	<0.001
Bun	12.22±5.6	12.00±2.1	0.797
Creatinine	0.85±0.5	0.81±0.1	0.61

*p<0.05, FPG: Fasting plasma glucose, PPG: Postprandial plasma glucose

Montgomery Asberg Depression Rating Scale (MADRS): is a scale that can evaluate state of patients with depressive symptoms and severity of somatic complaints. It consists of 10 items and each item is scored 0-6 (17). Validity and reliability study of Turkish version was made by Ozer et al. in 2001 (18).

Hamilton Anxiety Rating Scale (HAM-A): This form is designed to measure patients' anxiety levels and also to measure the symptom and severity distribution of anxiety across body systems. It is a simple scale consisting of 14 questions which evaluates mental and somatic symptoms and encoded by the interviewer marking on the scale. It is used to measure the anxiety level of the patient in last 72 hours (19). Validity and reliability study of Turkish version was made by Yazici et al. (20).

Statistical Analyses

Patient and control groups were compared with chi-square test; parametric data were examined with Student-t test and non-parametric data with Mann-Whitney U test. All the statistical analyses were made with SPSS 16 software.

RESULTS

A total of 50 patients with type 2 diabetes and 50 healthy controls were included in this study. The mean age for patient group was 44.7±8.6 years and 40.8±7.6 for control group and the difference was not significant (p=0.18). Forty four percent (n= 22) of the patient group were male and 56% (n= 28) were female; twenty five (50%) of the control group were male and 25 (50%) were female. There were no significant differences between the two

Table 2: Depression and anxiety scores of the patient and control groups

	Patients Mean±SD	Control Mean±SD	p
HAM	12.8±6.9	4.9±5.1	<0.001
MADRS	9.4±8.6	5.2±6.7	0.009*

*p<0.05

groups (p=0.55). Education and marital status were not significantly different between diabetic patients and healthy controls (p=0.37 and p=1.00, respectively). As shown table 1, there was no significant difference between patients and control groups in BUN and Creatinine levels (p=0.797, p=0.619, respectively). BMI, HA1c, fasting plasma glucose and postprandial plasma glucose levels were significantly higher in patient group than the control group. In diabetic patients, Hamilton anxiety and MADRS scores were significantly higher than healthy group (p<0.001 and p= 0.009, respectively) (Table 2).

In temperament dimensions, there were no significant differences between groups according to total/sub dimensions of novelty seeking, reward dependence, and persistence scores (p>0.05). Although total and most of the harm avoidance subscores did not differ between groups (p>0.05), the only significance was at HA4 (fatigability) subscore that diabetic patients were more fatigued than controls (p<0.001) (Table 3).

In character dimensions; total scores of all characters did not significantly differ between groups (p>0.05). However, score of third subdimension in cooperativeness character (helpfulness) was significantly higher in diabetic patients (p<0.05). On the contrary, third subdimension of self directedness character (resourcefulness) was significantly lower in patients than healthy controls (p<0.05) (Table 4).

Table 3: Comparison of temperament dimension between patients and controls

Temperament subdimensions	Patients group		p
	Mean - SD	Healthy controls Mean - SD	
NS (novelty seeking)	18.54 - 4.45	18.54 - 4.20	1.000
NS1 (exploratory excitability)	5.50 - 1.93	6.06 - 1.87	0.147
NS2 (impulsivity)	3.64 - 1.61	3.44 - 1.68	0.545
NS3 (extravagance)	4.00 - 1.71	3.96 - 2.07	0.917
NS4 (inorderliness)	5.40 - 1.71	5.08 - 1.62	0.341
HA (harm avoidance)	21.3 - 5.40	19.10 - 4.69	0.29
HA1 (anticipatory worry)	5.94 - 2.05	5.40 - 1.94	0.189
HA2 (fear of uncertainty)	7.56 - 1.26	7.46 - 1.47	0.717
HA3 (shyness)	2.70 - 1.80	2.40 - 1.74	0.401
HA4 (fatigability)	5.18 - 1.90	3.73 - 1.99	p<0.001
RD (reward dependence)	14.5 - 2.70	13.68 - 2.80	0.140
RD1 (sentimentality)	7.88 - 1.43	7.32 - 1.57	0.066
RD3 (attachment)	4.28 - 1.49	4.14 - 1.45	0.637
RD4 (dependence)	2.34 - 1.17	2.22 - 1.40	0.644
P (persistence)	5.18 - 1.55	5.64 - 1.58	0.151

Table 4: Comparison of character dimension between patients and controls

Character subdimension	Patient group		p
	Mean - SD	Healthy controls Mean - SD	
SD (self directedness)	24.9 - 6.15	27.12 - 5.75	0.077
SD1 (responsibility)	4.32 - 2.11	4.36 - 1.71	0.917
SD2 (purposefulness)	5.40 - 1.57	6.02 - 1.96	0.086
SD3 (resourcefulness)	2.42 - 1.23	3.16 - 1.28	*0.004
SD4 (self acceptance)	5.10 - 2.30	5.50 - 2.29	0.387
SD5 (congruent second nature)	7.74 - 2.38	8.12 - 1.99	0.389
C (cooperativeness)	29.0 - 5.42	29.47 - 5.84	0.704
C1 (social acceptance)	5.46 - 1.77	6.00 - 1.49	0.103
C2 (empathy)	3.56 - 1.28	3.97 - 1.39	0.122
C3 (helpfulness)	4.96 - 1.39	4.41 - 1.16	*0.040
C4 (compassion)	7.50 - 3.00	7.40 - 2.68	0.873
C5 (principled)	7.56 - 1.75	7.92 - 1.65	0.293
ST (self transcendence)	20.3 - 4.23	19.78 - 4.49	0.553
ST1 (self forgetfulness)	5.18 - 1.88	5.42 - 1.84	0.521
ST2 (transpersonal identification)	6.28 - 1.93	5.54 - 1.99	0.063
ST3 (spiritual acceptance)	8.84 - 1.84	8.82 - 2.13	0.960

*p<0.05

DISCUSSION

Although most studies have showed that there are significant personality differences between diabetes and non-diabetes populations, there is wide divergence with respect to diabetes personality profile. Our primary goal was to test the hypothesis that some personality traits (measured by TCI) are related to type 2 diabetes and this relationships might be effective in glucose control. In our study, temperament and character profiles of patients showed some significant differences compared to normal

controls. Previous studies have suggested that some personality traits are specific to diabetes and the glycemic control can be related to these personality traits. Weibe et al. found that worries about diabetes and negative affect (trait anxiety) may have negative impact on disease management and glycemic control (21). Brickman showed that type 1 diabetic patients with high conscientiousness and low neuroticism had renal deterioration times that were 12 years longer than patients with low conscientiousness (22). In Yoda et al. study, patients with type 2 were divided into two clusters based

on the TCI results. Patients in cluster 1 were obsessive and the patients in cluster 2 were described as histrionic. The authors concluded that diabetes self-management support should be designed according to psychological characteristic subtypes of patients because of differences in glucose control in both groups (23).

Many studies reported that patients with diabetes demonstrate significantly more anxiety and depressive symptoms than the general population (24,25,26). The prevalence of depressive disorder in patients with type 2 diabetes ranges from 10.9-32.9% (27). The mechanisms underlying relationship between depression and diabetes are still unclear (28). In our study, as expected, depression scores were found higher in patients group than in control group.

Our study revealed that diabetic patients had modest different personality features measured with TCI than controls. DM is a chronic metabolic illness affecting many systems. As in many chronic illnesses individuals develop some behavioral patterns in accordance with disease coping skills and so their adaptation, life, capabilities and functionality differ. Whether the detected difference should be taken directly as a personality feature or it should be considered to be the result of the depressive mood, anxiety disorder, and/or chronic illness is not known.

In our study only HA4 (fatigability) subscale from the TCI was higher in patients than in controls. This means that diabetics have more fatigue than controls. People with high fatigability tend to be more inactive, live sedentarily and gain weight in time. As physical activity can play a role in the improvement of glucose tolerance and insulin sensitivity, fatigability appears to be risk for the development of type 2 diabetes independent from obesity (29,30). It is likely that individuals with this personality trait have increased type 2 diabetes risk. Harm avoidance, mostly with all its subscales, is found to be high in depression and so it can be evaluated as a specific feature of depression (31,32). In this study, we could not demonstrate any significant difference between two groups regarding harm avoidance, although patients with

type 2 diabetes had significantly higher depression scores than healthy controls. To determine whether this condition is a specific feature of diabetic patients in the early stage non-complicated diabetes should be evaluated in further research.

In our study we failed to find a difference in TCI character features except a lower SD3 (resourcefulness) score and a higher C3 (helpfulness) score. As indicated by low SD3 scores diabetic patients seem to be more passive than healthy people. Diabetic patients are dealing with chronic treatment and deleterious effects of diabetes in their lives. Thus, in most of time they are engaged in concerns about their bodies which might come out as inability to cope with or to develop new strategies. Individuals with high C3 (helpfulness) scores understand the preferences and needs of others as well as their own and they try to cooperate with others. This personality trait may be useful in adherence to diabetic regime, if they are asked to comply with fixed list of do's and don'ts about diabetes care. Lack of diabetic complications in our patient sample might lead us to suspect the relationship between glycemic control and personality. However this finding is not in line with an earlier study (33) that showed no relationship. Nevertheless, further observations from longitudinal studies are needed to clarify this point.

There are several limitations to the present study, and results should be interpreted with caution. First, our sample is relatively small. These data must be replicated in larger samples of patients. Second, we did not use another chronic disease group, but healthy volunteers as control group. It may be more useful to explore personality profile in patients with type 2 diabetes.

In summary, based on our results, patients with type 2 diabetes mellitus may have significantly different temperament and character properties than normal population and patients with chronic disease may exhibit different personality profile. These results point to the idea that personality assessment should to be considered as an important factor in medical management and long term glycemic control of type 2 diabetes.

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