

Assessment of Affective Temperament in Knee Osteoarthritis Patients and Its Effects on Physical Therapy Response

Diz Osteoartritli Hastalarda Afektif Mizaç Değerlendirilmesi ve Fizik Tedaviye Yanıtı Üzerine Etkileri

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ABSTRACT Objective: To determine the most common dominant affective temperament and its effects on the physical therapy outcomes in patients with knee osteoarthritis (OA). **Material and Methods:** One hundred and five primary knee OA patients referred with knee pain were assessed for eligibility. Eighty-six patients who met inclusion and exclusion criteria were included in this study. Physical therapy was applied once daily, five days a week, a total of 15 sessions to the both knees of the patients. Treatment response was evaluated by visual analog scale before and after the therapy. Patients were divided into two groups by treatment response: Group 1 (pain alleviation $\geq 50\%$) and, Group 2 (pain alleviation $< 50\%$). Turkish version of the Temperament Evaluation of Memphis, Pisa, Paris and San Diego Auto questionnaire (TEMPS-A) scale was used to determine the dominant affective temperament. **Results:** The frequency of depressive, anxious, irritable, cyclothymic and hyperthymic temperaments were 18.6%, 17.4%, 5.8%, 3.5% and 0%, respectively. The physical therapy outcome was good in 59 patients (Group 1) whereas it was poor in 27 patients (Group 2). The most common dominant affective temperament was depressive temperament in both groups. Prevalence of dominant affective temperaments was not significantly different between Group 1 and Group 2. This study also showed that physical therapy outcome was not associated with dominant affective temperament. **Conclusion:** This study suggest that depressive and anxious temperaments are the most common dominant affective temperaments, and there appears to be no association between the pain alleviation by physical therapy and dominant affective temperament in knee OA patients.

Key Words: Temperament; osteoarthritis; treatment outcome

ÖZET Amaç: Diz osteoartritli hastalarda, en yaygın baskın afektif mizaç ve bunun fizik tedavi sonuçlarını etkileyip etkilemediğini belirlemek. **Gereç ve Yöntemler:** Diz ağrısı ile başvuran 105 primer diz osteoartritli hasta değerlendirildi. Dahil edilme ve dışlanma kriterlerine uyan 86 hasta bu çalışmaya dahil edildi. Hastalara haftada beş gün günde bir kez her iki dize toplam 15 seans uygulandı. Tedaviden önce ve sonra alınan tedavi yanıtı vizüel analog skalası ile değerlendirildi. Tedaviye alınan yanıt yönünden hastalar iki gruba ayrıldılar: Grup 1 ($\geq 50\%$ ağrı azalma) ve grup 2 ($< 50\%$ ağrı azalma). Memphis, Pisa, Paris ve San Diego Duygudurum Otoanket (TEMPS-A) değerlendirme skalası baskın afektif mizaç değerlendirmek için kullanıldı. **Bulgular:** Depresif, aksiyöz, iritabl, siklotimik ve hipertimik duygudurum sıklıkları sırasıyla, %18.6, %17.4, %5.8 ve %3.5 idi. Fizik tedavi sonucu 59 hastada (Grup 1) iyi, 27 hastada (Grup 2) ise kötüydü. Her iki grupta da en sık görülen baskın afektif mizaç depresifti. Baskın afektif mizaç sıklıkları grup 1 ile grup 2 arasında anlamlı farklılık göstermiyordu. Bu çalışma aynı zamanda fizik tedavi sonuçlarının baskın afektif mizaç ilişkiz olduğunu da gösterdi. **Sonuç:** Bu çalışma depresif ve aksiyöz duygudurumların en sık gözlenen baskın afektif mizaç olduğunu ve diz osteoartrit (OA) hastalarında fizik tedavi sonucu ağrıdaki azalma ile baskın afektif mizaç arasında bir ilişki olmadığını ortaya koymuştur.

Anahtar Kelimeler: Huy; osteoartrit; tedavi sonucu

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Affective temperament describes attitudes and behaviors which stand on structural, genetic and biological basis.¹ It is possible to see it as a feature of personality without affective disorders or a basis of affective disorders, like depression or bipolar disease throughout life.² Five dominant affective temperaments are described: depressive, hyperthymic, cyclothymic, irritable and anxious.³

Osteoarthritis (OA) is a degenerative joint disease that leads to chronic pain. Primary goal of the management of knee OA is to alleviate the pain. Chronic pain is usually associated with depression.^{4,6} Axford et al suggest that pain and depression are the major obstacles in the management of knee OA, and depression affects treatment outcome as well as clinical course of chronic pain in these patients.⁷

Various factors including knee pain may trigger or enforce depression in patients with knee OA. There is an episodic nature of depression. Due to these features of depression, a relationship between clinical course or treatment outcome of the knee OA and depression may not be clear enough. Affective temperament, unlike depression, is believed to be relatively stable throughout life.⁵ Affective temperament also forms the basis of affective disorders like depression.¹

The aim of this study was to determine the most common dominant affective temperament and whether the dominant affective temperament affects the physical therapy outcome in patients with knee OA.

MATERIAL AND METHODS

This was a prospective, single-blind, observational study.

ETHICS

The study was performed in accordance with the principles of Declaration of Helsinki. Ethical approval was obtained from the Institutional Review Board. All participants were volunteers and provided their written informed consent.

SUBJECTS

One hundred and five primary knee OA patients referred with knee pain were assessed for eligi-

lity. Primary knee OA was diagnosed by Classification Criteria for Idiopathic Osteoarthritis of the Knee.⁸ Exclusion criteria were non-cooperative cases, having unilateral knee OA, secondary OA, low back/hip pain, systemic inflammatory disease, presence of neoplasms and patients treated with physical therapy methods or having had intra-articular injections in the last six months. Eighty-six subjects (23 males, 63 females) met inclusion and exclusion criteria, and were included in this study. The mean age was 56.2 (range: 37-77) years.

PROCEDURE

This study was conducted on outpatients receiving physical therapy. Physical therapy (hot pack for 20 minutes, shortwave diathermia for 20 minutes and transcutaneous electrical nerve stimulation for 15 minutes) was applied once daily, five days a week, a total of 15 sessions to the both knees of the patients. All cases completed 15-sessions of physical therapy. All patients also received non-steroidal anti-inflammatory drug (diclofenac Na 50 mg, 2 x 1). Turkish version of the Temperament Evaluation of Memphis, Pisa, Paris and San Diego Auto questionnaire (TEMPS-A) scale was used to determine the dominant affective temperament. After obtaining patient consent, research volunteers were asked to complete the TEMPS-A. Study on validity and reliability of Turkish version of the TEMPS-A scale was performed by Vahip et al.⁹ Turkish version the TEMPS-A scale is a self-report instrument consisting of five subscales. Its 100 constituent items inquire about the subject's whole life about traits along depressive, cyclothymic, hyperthymic, irritable, and anxious lines. Individuals answered as "yes" or "no" considering whole of their lives. Cut-off points to determine dominant temperament are 13 for depressive (19 items), 18 for cyclothymic (19 items), 20 for hyperthymic (20 items), 13 for irritable (18 items) and 18 for anxious (24 items) mood. It is possible that somebody may have more than one dominant affective temperament.

Pain intensity was assessed on a 100-mm VAS scale before and after the therapy. Patients were asked to mark their severity of pain as perceived by

them on a continuous (non-hatched) vertical VAS of 100 mm anchored at bottom with description “no pain” and at top by “unbearable pain”. We determined the VAS score (1 mm= 1) by measuring the distance from the bottom to the mark made by the patient.

The physician evaluated outcome of physical therapy blinded to dominant affective temperament of the patients. Kellgren and Lawrence system¹⁰ was used for radiographic grading of knee OA. Physical therapy outcome was accepted to be good, if pain alleviation according to VAS was equal or greater than fifty percent. Physical therapy outcome was accepted to be poor, if pain alleviation according to VAS was less than fifty percent. Based on the physical therapy outcome, patients were divided into two groups: Group 1 (the outcome was good) and Group 2 (the outcome was poor).

STATISTICAL ANALYSIS

Data were summarized as median, minimum and maximum. The Kolmogorov-Smirnov test was used to analyze the data were normally distributed. The Mann-Whitney U test was used to analyze the statistical difference in the age, body mass index (BMI), disease duration, symptom duration and VAS between Group 1 and Group 2. Fisher's Exact test or Yate's corrected Chi-square was performed to analyze the distribution of the dominant affective temperaments and gender in two groups. Chi-square was performed to analyze the distribution of the knee OA grades in two groups. The Spearman test was used to analyze the correlation between pain alleviation by physical therapy and dominant affective temperament. A correlation coefficient (R) value of more than 0.30 and a P value of less than 0.05 were considered statistically significant. The data management software package used was the Statistical Package for the Social Sciences (SPSS) version 10.0 for Windows.

RESULTS

The frequency of depressive, anxious, irritable, cyclothymic and hyperthymic temperaments were 18.6%, 17.4%, 5.8%, 3.5% and 0%, respectively.

Four patients had both depressive and anxious temperaments, two had depressive, anxious and cyclothymic temperaments, two had depressive, anxious and irritable temperaments, and one had depressive, cyclothymic and irritable temperaments.

The physical therapy outcome was good in 59 patients (Group 1), whereas it was poor in 27 patients (Group 2). Female/male ratio was higher in Group 2 ($p=0.008$) (Table 1). There was no statistically significant difference between radiographic grades of the Group 1 and Group 2 (Table 2).

The most common dominant affective temperament was depressive temperament in both groups. The prevalence of dominant affective temperaments were not significantly different between Group 1 and Group 2 ($p>0.05$) (Table 3). There was no correlation between pain alleviation by physical therapy and dominant affective temperament ($R<0.30$ and $p>0.05$) (Table 4).

TABLE 1: Demographic and clinical features of both groups [median (min-max)].

	Group 1	Group 2	p value
Female / Male	38/21	25/2	0.008
Age (yrs)	55 (39-77)	53 (37-76)	0.963
Body mass index (kg/m ²)	29.4 (22.1-36.5)	28.4 (18.6-35.4)	0.208
Disease duration (yrs)	5 (0.5-40)	4 (1-20)	0.398
Symptom duration (wks)	2 (1-72)	2 (1-72)	0.914
VAS (before therapy)	70 (30-100)	60 (10-100)	0.753
VAS (after therapy)	20 (0-50)	50 (20-90)	0.000

$p<0.05$ significant. VAS: visual analog scale.

TABLE 2: Radiographic grading of knee osteoarthritis in both groups (number of patients).

OA grade	Right Knee		Left Knee	
	Group 1	Group 2	Group 1	Group 2
Normal	6	4	5	5
Minimal	1	1	4	2
Moderate	21	5	24	5
Severe	31	17	26	15
p value	0.422		0.185	

$p<0.05$ significant.

TABLE 3: Prevalence of dominant affective temperaments in both groups (number of patients).

Dominant affective temperament	Group 1	Group 2	p value
Depressive	10/59	6/27	0.776
Cyclothymic	3/59	0/27	0.549
Hyperthymic	0/59	0/27	-
Irritable	4/59	1/27	1.000
Anxious	9/59	6/27	0.542

p < 0.05 significant.

TABLE 4: Correlation between pain alleviation (good or poor) by physical therapy and dominant affective temperament.

Dominant affective temperament	Pain Alleviation	
	R	p value
Depressive	-0.063	0.565
Cyclothymic	0.129	0.238
Hyperthymic	-	-
Irritable	0.061	0.577
Anxious	-0.085	0.435

(R: correlation coefficient) p < 0.05 significant.

DISCUSSION

This is the first study evaluating the affective temperaments of the patients with knee OA. The main findings of the present study are that depressive temperament was the most common dominant affective temperament and there was no association between the pain alleviation by physical therapy and dominant affective temperament in knee OA patients. Vahip et al found that dominant irritable (3.7%), anxious (3.7%) and depressive (3.1%) temperaments were most common in 658 healthy Turkish subjects, whereas dominant cyclothymic (1.7%) and hyperthymic (1.2%) temperaments were relatively uncommon.⁹ The depressive and anxious temperaments seemed to be more common in our study patients compared to normal Turkish population. The depressive and anxious temperaments have been reported to be more common in patients with chronic locomotor system diseases, such as hemiplegia compared to normal population.¹¹

Among the five temperament subscales, the depressive temperament and the anxious temperament have been reported to be the most correlated,

reflecting the known co-morbidity between anxiety and depression.¹² Individuals with depressive temperament exhibit low energy, low spirits and negative cognitions. The anxious temperament is a lifelong tendency to worry about one's welfare and that of one's immediate kin, and originally hypothesized to predispose to depression phobic disorders. The hyperthymic temperament is the precursor of more classical elated manias. Irritable temperament is characterized by a highly unstable mixture of dysthymic and hyperthymic traits and manifests itself in traits such as habitual complaining, overcritical attitudes, and angry outbursts. Cyclothymic temperament is characterized by rapid and unpredictable mood swings between the depressive and the hyperthymic poles.^{13,14} It may be a research topic why the depressive and anxious temperaments are more common in patients with chronic locomotor system diseases including knee osteoarthritis. Regarding this issue, further research is needed.

In clinical practice, more than 50% improvement in pain obtained with physical therapy, is considered satisfactory. Therefore, physical therapy outcome was accepted to be good, if pain alleviation according to VAS was equal or greater than 50% in this study. Prevalences of the depressive and anxious temperaments in Group 1 was similar to those found in Group 2, whereas they were more common in our knee OA patients compared to normal Turkish population. No significant association was found between dominant affective temperament and pain alleviation by physical therapy. These findings suggest that depressive or anxious affective temperaments may be important in developing chronic pain instead of physical therapy response in knee OA patients. Disease duration was longer than six months in both groups.

Depression can negatively effect treatment outcomes in management of obstructive pulmonary disease, chest pain and periodontal disease.^{15,16} Depression is also reported to be a major obstacle in management of knee OA⁷. No association was found between affective temperament and treatment response was found in this study, whereas temperaments are likely to represent liability fac-

tors in the subsequent development of affective disorders, like depression.¹⁷ This contradictory finding may be explained with strength of relationship between affective temperament and depression: knee OA patients can have depression but not any dominant affective temperament, or depression may not manifest in knee OA patients having depressive or anxious temperament, or various factors, in addition to pain, like disability can trigger depression in the patients who have depressive/anxious temperament. A further study investigating a relationship between depression and affective temperament in patients with knee OA can give definite and reliable information about these questions.

This study has a limitation. The number of cases included in this study was relatively small. This research was not performed in patients with knee OA. Instead, the knee OA patients receiving physical therapy were performed. Therefore, in the present study, the number of cases are limited.

CONCLUSION

The current study suggests that depressive and anxious temperaments are the most common affective temperaments and that there appears to be no association between the pain alleviation by physical therapy and dominant affective temperament in knee OA patients.

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