ÖZGÜN ARAŞTIRMA ORIGINAL RESEARCH

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THE ASSOCIATION OF TYPE D PERSONALITY AND PREMENSTRUEL SYNDROME

PREMENSTRUEL SENDROM İLE TİP D KİŞİLİK İLİŞKİSİ

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Öz

Amaç
Negatif duygulanım ve Sosyal içe dönüklük olmak üzere iki kişilik karakterinin varlığı olarak tanımlanan D tipi kişiliğin, çeşitli hastalıklarla ilişkili olduğu bilinmektedir. Çalışmamızın amacı, Tip D kişilik ile premenstruel sendrom (PMS) arasındaki ilişkiyi araştırmaktır.

Gereç ve Yöntem
Çalışmaya toplam 286 kadın (PMS:86; kontrol:200) dahil edildi. Yaş ortalamaları 21,28 ± 0,12 di. Veriler Premenstrüel Sendrom Ölçeği, Beck Depresyon Envanteri (BDI-21), D Tipi kişilik Ölçeği (DS14) sonuçlarından elde edildi. Verilerin değerlendirilmesi için SPSS 22 (Statistical Package for Social Sciences) programı kullanıldı. İstatistiksel anlamlılık düzeyi p<0,05 olarak kabul edildi. Sürekli değişkenlerin karşılaştırılmasında t testi, kategorik verilerin karşılaştırılmasında ki-kare testi, sürekli değişkenler arasındaki ilişkileri belirlemek için pearson korelasyon testi kullanıldı.

Bulgular
Depresyon ve D Tipi kişilik, PMS grubunda kontrol grubuna göre anlamlı olarak daha yaygın bulundu. (p<0.0001). D tipi kişilik ile, PMS ve BDI-21 arasında pozitif korelasyon tespit edildi (r=0,434 p<0.0001,r=0,621 p<0.0001).

Sonuç
PMS ile depresyon ve D Tipi kişilik arasında pozitif ilişki tespit edildi. Altta yatan mekanizmaları daha iyi anlayabilmek için ileriye dönük, çok hasta sayılı çalışmalar yapılması gerekmektedir.

Anahtar Kelimeler: Depresyon, Kişilik, Premenstruel sendrom

Abstract

Objective
Type D personality, defined as the presence of two personality characters -negative affectivity (NA) and social inhibition (SI), is associated with various disorders. The aim of our study was to investigate the association between Type D personality and premenstruel syndrome (PMS).

Material and Methods
A total of 286 female (86 with PMS and 200 control) were recruited for the study. The mean age of the participants was 21.28 ± 0.12 years. Data were

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obtained from the Premenstrual Syndrome Scale, Beck Depression Inventory (BDI-21) and Type D Personality Scale (DS14). SPSS 22 (Statistical Package for Social Sciences) program was used to evaluate the data. Statistical significance level was accepted as $p<0.05$. T test was used to compare continuous variables, chi-square test was used to compare categorical data, and pearson correlation test was used to determine the relationships between continuous variables.

Results
Depression and Type D personality were found to be significantly more common in the PMS group than in the control group ($p<0.0001$). Type D personality was positively correlation with PMS and BDI-21 ($r=0.434$, $p<0.0001$; OD ($r=0.621$, $p<0.0001$).

Conclusion
A positive relationship was found between PMS and depression and Type D personality. Prospective studies with a large number of patients are needed to better understand the underlying mechanisms.

Keywords: Depression, Personality, Premenstrual syndrome.

Introduction

Premenstrual syndrome (PMS) is a cyclical late luteal phase disorder of the menstrual cycle whereby the daily functioning of woman is affected by emotional and physical symptoms substantially interfering with her quality of life (1). Globally, 50%-80% of women experience PMS and 30%-40% of them present with severe symptoms that affect physical, psychological as well as mental health which require treatment (2).

The etiopathogenesis of PMS is not fully understood. Recent evidence from research studies suggests that reproductive hormone release patterns are normal in women with PMS but women with PMS have a heightened sensitivity to cyclical variations in the levels of reproductive hormones which predisposes them to experience mood and behavioral alterations, and somatic symptoms (3). Gonadal steroid fluctuations may modulate serotonergic transmission and dysregulation of the serotonin system in women with PMS has been demonstrated (4). The probable role of aforementioned mechanisms, PMS causes important behavioral changes in a way that disrupts social relations and daily activities. There is also a relationship between PMS and negative psychological effects such as depression, anxiety, and emotional stress (5).

Type D personality is a personality type characterized by negative affectivity (NA) and social inhibition (SI). It is a general tendency to experience emotional distress characterized by the inhibition of the expression of emotions or behaviors in social relations (SI) and the predisposition to negative mood (NA). People with SI tend to experience inhibition, stressful and insecure social relations due to the fear of rejection and disapproval by other individuals (6). People with NA tend to feel negative emotions in the face of situations and time and these individuals often report feelings of dysphoria, depression, anxiety, tension, irritability, worry, and unhappiness. Type D personality has been reported to be associated with the presence of chronic disorders (7) and the clinical outcomes of various disorders such as cardiac disorders (8), chronic pain (9), fibromyalgia (10). However, there is no study investigating the role of Type D personality on PMS.

Common incidence of PMS, its' relation with physiological well-being, behavioral changes, and disruption of daily activities resulting as well as the paucity of the investigations in this field, we aimed to investigate the relationship between PMS and Type D personality.

Material and Methods

Study Design
This was a cross-sectional study conducted at the Family Medicine outpatient clinic of a tertiary center, six months from July and December 2018. All participants provided written informed consent before enrolling in this study.

Sampling Methods and Sample Size
A total of 286 young female patients (18-23 years), 86 diagnosed as a premenstrual syndrome -the PMS group, and 200 age and body mass index (BMI) matched healthy females without PMS -the control group, were recruited to the study. PMS diagnosis was made by Premenstrual Syndrome Scale (PMSS) (11). The PMSS is a Likert scale consisting of 9 subgroups and 44 items, totally. Scores of PMSS varies between 44 and 220 points, and the cut -off score was 102. As the score increases, the symptoms of PMS are considered to be increased (11).

The exclusion criteria for all participants were a history of any psychiatric disorder, pregnancy, presence of chronic diseases, and chronic medication use.

Data Collection

A self-administered questionnaire including demographic features -age, weight, height, age at menarche, cycle characteristics (duration, volume, regularity, etc.), habits (smoking, alcohol use), presence of sporting activity (≥3 days per week), the requirement of an analgesic drug, herbal medication and traditional method (heat and coffee, etc.) for dysmenorrhea of the participants were used for data collection. Body mass index (BMI) was calculated as the ratio of weight to height squared (kg/m2).

Depression was evaluated using the 21-item Beck Depression Inventory (BDI-21) which is a self-report inventory that measures the severity of depression. These scales were administered to all participants at their enrollment and the scores were noted. Each item in BDI-21 describes a specific behavioral, emotional, and somatic manifestation of depression. The scores range from 0 to 3. Having more than 17 points was considered depression. Mild depression was considered for a total of 17-20 points, moderate depression was considered for 21-30 points and severe depression was accepted as having more than 30 points (12).

Type D personality was evaluated using the DS-14 scale. This 14-item questionnaire comprises two 7-item subscales: NA (e.g. 'I take a gloomy view of things') and SI (e.g. 'I often feel inhibited in social interactions'). Two positively worded items on the SI subscale (e.g. 'I often talk to strangers') were reverse scored. Responses to each item were made on a five-point scale ranging between 0 and 4, yielding a total score of between 0 and 28 for each subscale. Women with a score ≥10 points on NA and SI subscales were considered as Type D personality (6).

Statistical Analyses

Statistical Package for Social Sciences (SPSS) version 22 was used to evaluate the data obtained from the participants. Statistical significance level was accepted as $p < 0.05$. Student t-test and Mann Whitney-U test were used for the comparison of the continuous variables on the basis of their distribution. The Chi-square test was used for the comparison of the categorical data and shown as frequencies. The Pearson correlation tests were performed to determine the relationships between continuous variables for parametric and nonparametric data, respectively.

Permission and Approval of the Ethics Committee

The study was conducted in accordance with the principles of the Helsinki Declaration related to conducting clinical trials on humans, and the research proposal was approved by the Ethics Committee of the Süleyman Demirel University with the number 140 in 04 July 2018.

Results

A total of 286 subjects (86 female in the PMS group and 200 female in the control group) were included in the study. The mean age of the participants was 21.28 ± 0.12 years. There were no significant differences in terms of age, BMI, age at menarche, duration of cycle and menstruation, menstrual regularity, smoking and alcohol use, sporting activity (>3 days per week). The volume of menstrual bleeding was significantly higher in the PMS group (3.55 ± 1.31 pad/day) compared to the controls (3.16 ± 1.25, p=0.01). Dysmenorrhea was also significantly more prevalent in the PMS group (90.7%) than the controls (78.5%, p<0.01), as expected. The requirement of analgesic during menstruation was higher in the PMS group (60.5%) compared to the controls (45.5%, p=0.02). However, the type, duration, and the number of analgesic use were distributed homogenously between two groups (p=0.8, p=0.6, and p=0.2, respectively). The use of herbal medicine for dysmenorrhea was similar between the groups (p=0.07), however, the use of a traditional methods (such as coffee, heat) was significantly higher in the PMS group (52.3%) than the controls (38.5%, p=0.03). Comparison of demographic features of the participants are given in Table 1.

BDI-21 score was higher in the PMS group compared to the controls with a significant difference (p<0.0001). Depression was found in 26.9% (77/286) of the participants. Of those with depression, 10.1% (29/77) had mild depression, 9.1% (26/77) had moderate depression, and 7.7% (22/77) had severe depression. 54.7% (47/86) of the PMS group had depression, and depression was found to be significantly more prevalent in the PMS group compared to the controls (15.5%, p<0.0001). When the severity of depression was compared between the groups, it was found to be severe in22.1% (19/46) of the PMS group and 1.5% (3/31) of the control group.

54.5% (156/286) of the participant had Type D personality. The scores of the NA and SI subscales were higher in the PMS group than in the controls (p<0.0001 and p=0.04, respectively). In the PMS group, 83.7% (72/86) of patients had NA and 87.2%

Table 1 Baseline demographic features of premenstrual syndrome group and control group

	Control group (n=200)	PMS group (n=86)	p value
Age (years)	21.3 ± 2.2	21.17 ± 2.07	0.1
BMI (kg/m²)	21.67 ± 3.01	21.46 ± 2.85	0.3
Age at menarche (years)	12.92 ± 1.09	12.6 ± 1.07	0.05
Duration of cycle (days)	28 ± 1.23	29 ± 2.1	0.6
Duration of menstruation (days)	5.79 ± 1.21	5.98 ± 1.22	0.7
Volume of menstrual bleeding (pad/day)	3.16 ± 1.25	3.55 ± 1.31	**0.01**
Menstrual irregularity (n, %)	16/200 (8%)	8/86 (9.3%)	0.8
Dysmenore (n, %)	157/200 (78.5%)	78/86 (90.7%)	**0.01**
Habits (n,%) **Smoking** **Alcohol use**	 21 (10.5%) 30 (15%)	 8 (9.3%) 9 (10.5%)	 0.7 0.3
Sportic activity (n,%) (≥3 days per week)	75 (%37.5)	32 (%37.2)	0.9
Requirement of analgesic (n, %)	91 (45.5%)	52 (60.5%)	**0.02**
Type of analgesic use (n, %) **Nonsteroid antiinflamatuar drug** **Antispasmotic**	 77/91 (84.6%) 14/91 (15.4%)	 4/52 (82.7%) 9%52 (17.3%)	0.8
Duration of analgesic use (day) **2 day (before mens and day 1)** **1 day (day 1)** **During menstruation**	 3/91 (3.3%) 80/91 (87.9%) 8/91 (8.8%)	 3/52 (5.8%) 46/52 (88.5%) 3/52 (5.8%)	0.6
The number of analgesic use (n)	1.98 ± 1.35	2.36 ± 2.83	0.2
Use of herbal medicine (n, %)	27 (13.5%)	19 (22.1%)	0.07
Use of traditional method (n, %)	77/200 (38.5%)	45/86 (52.3%)	**0.03**
Type of traditional method used (n, %) **Heat** **Coffee**	 76/77 (98.7%) 1/77 (1.3%)	 45 (100%) 0	 1

BMI: Body mass index.
PMS: Premenstrual syndrome

(75/86) had SI. NA and SI were significantly more prevalent in the PMS group than the control group (p<0.0001, and p=0.03, respectively). In the PMS group, 75.6% (65/86) had Type D personality, whereas 45.5% (91/200) of the control group had Type D personality. Type D personality was also significantly more prevalent in the women with PMS compared to the women without PMS (p<0.0001). Comparison of Type D personality and depression scores and rates for the groups are given in Table 2.

Correlation analysis showed a positive correlation between PMS score, depression and Type D personality Table 3.

Table 2 Comparison of Type D personality and depression scores and rates between the groups

	Control group (n=200)	PMS group (n=86)	p value
BDI score (points)	9.19 ± 6.8	18.87 ± 11.38	**<0.0001**
Depression, present (n, %)	29 (14.5%)	46 (53.5%)	**<0.0001**
Severity of depression (n, %) **Mild (17-20 point)** **Moderate (21-30 points)** **Severe (>30 points)**	 17/29 (58.6%) 10/29 (34.5%) 2/29 (6.9%)	 14/46 (30.4%) 14/46 (30.4%) 18/46 (39.1%)	**0.005**
NA score (points)	10.95 ± 6.02	15.66 ± 6.73	**<0.0001**
NA (n, %)	111/200 (55.5%)	72/86 (83.7%)	**<0.0001**
SI score (points)	11.77 ± 4.06	14.17 ± 4.67	**0.04**
SI (n, %)	142/200 (71%)	75/86 (87.2%)	**0.03**
Type D personality. present (n, %)	91/200 (45.5%)	65/86 (75.6%)	**<0.0001**

BDI: Beck depression inventory; NA: Negative affectivity; SI: Social inhibition.

Table 3 Correlation between PMS, Type D personality and depression.

	PMS	Type D personality	NA	SI
BDI	0,434**	0.621**	0.623**	0.430**
PMS		0.362**	0.359**	0.259**
Type D personality			0.922**	0.818**

**Correlation is significant at the 0.05 level (2-tailed)

Discussion

Herein, we investigated the relationship between Type D personality and PMS in 286 women (200 in the control group and 86 in the PMS group). Our results suggest that Type D personality may affect the PMS status of women. We found significantly higher rates of NA, SI, and Type D personality in the PMS population than in the controls. Depression and the severity of depression were also more prevalent in the women with PMS compared to the women without PMS. Positive association between Type D personality, PMS and depression

Premenstrual symptoms include a constellation of mood, behavioral, and physical indications that occur in a cyclic pattern prior to menstruation and then decrease after the menstrual period in women of reproductive age (4). During the premenstrual period, onset of a depressive episode may be observed. Approximately, 65% of women with unipolar depression experienced PMS (13). It is evident that women are twice as likely as men to develop the major depressive disorder during their reproductive years across different countries and different settings (14). Research studies found that a significant relationship between the risk of depression and PMS in studies in which they evaluated the presence of depression using different scales (15). Similar results of increased rates of depression in those suffering from PMS have been found by other authors (16-19). Our results concur with previous findings as we observed the presence of depressive symptoms to be associated with PMS. Depression was also found to be more severe in the PMS group compared to the controls in the recent research. The medical literature

and the results of our research indicate that persons who have PMS should be evaluated in terms of the risk of depression.

Type D personality refers to individuals with a joint propensity toward negative affectivity (NA) as well as social inhibition (SI). Recently, the relationship between Type D personality and health in the general population is beginning to receive more attention. Previous studies showed a prevalence range of 21–33% of Type D personality in the general population (20). This personality trait is linked to biological and behavioral mechanisms which may affect health. Neuroendocrine and immunologic pathways have been investigated to explain the negative clinical outcomes for patients with Type D personality and increased pro-inflammatory immune activation (21), oxidative stress (22), and cortisol levels (23) found to be related to Type D personality. Type D personality is related to depression, anxiety, somatization (20), dysregulated stress reactivity (24), sleep problems, psychosomatic symptoms, musculoskeletal pain (25), lower subjective quality of life (26), adverse health behaviors (27). Most of the studies have evaluated the relationship between depression and PMS; however, the present study is the first that evaluates the role of Type D personality on PMS. In the recent study, a positive association between Type D personality and the presence of PMS even after the adjustment of the parameters that were different between the PMS and the control group and correlated with PMSS score and could affect PMS. The scores for the NA and SI were also strongly correlated with the scores for the PMSS.

Research studies showed that the prevalence of PMS and PMDD (Premenstrual dystrophic disorder) were higher among younger women, women with higher BMI, women whose age at menarche was 12 years or younger, and women who are physically inactive (28-30). In contrast, PMS was not associated with age, BMI, and women who do sportic activity in our study. Small sample size and the definition of ‘physically inactive’ person could be the reason of discrepancy in the results with the previous studies In the literature, PMS also increases in women with menstrual irregularities (31), long menstrual duration, and cycles (32). In our research, no significant relationship was determined between characteristics of the menstrual cycle with PMS, however, the volume of menstrual bleeding was significantly higher in the PMS group compared to the controls. A strong association between the duration of the menstrual period and volume of bleeding could explain the discrepancies in the results with the previous studies (3, 33). Smoking and alcohol use during the adolescent period has been found to be a risk factor for PMS (3, 33) We could not found any differences in terms of smoking and alcohol use between PMS and control groups. Longitudinal studies evaluating the association between age, obesity, exercise, and PMS should be conducted.

The main limitation of our research is its’ cross-sectional design. A longitudinal study would better explain the association between PMS and Type D personality. The other limitation that should be taken into account when interpreting the results is the bi-directional relationship between personality type and PMS. Because Type D personality could be a risk factor for PMS or PMS could create Type D personality. The third limitation is that the data of this study were obtained from participants through a self-reported questionnaire, which may reflect bias in self-reporting (i.e. participants may have underestimated or overestimated their level of PMS and PMDD symptoms). Further large sample-sized investigations should be performed to investigate the underlying cause for the pathogenetic mechanism of the relationship between Type D personality and PMS. Despite the aforementioned limitations, an association between Type D personality and PMS was shown for the first time.

Conclusion

There is a positive relationship between PMS, depression and Type D personality. Large sample-sized studies are required to further understand the mechanisms underpinning the now well-documented relationship. Knowing the personality type in patients with PMS may be beneficial for the treatment of PMS. It can also improve the patient's quality of life and well-being.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Ethical Approval

The study was conducted in accordance with the principles of the Helsinki Declaration related to conducting clinical trials on humans, and the research proposal was approved by the Ethics Committee of the Süleyman Demirel University with the number 140 in 04 July 2018.

Consent to Participate and Publish

Written informed consent to participate and publish was obtained from all individual participants included in the study.

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