

THE ASSOCIATION OF TYPE D PERSONALITY AND PREMENSTRUEL SYNDROME

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Abstract

OBJECTIVE Type D personality is characterized by negative effectiveness (NA) and social inhibition (SI). The aim of study was to investigate the association between Type D personality and premenstruel syndrome (PMS). **METHODS:** A total of 286 (86 in PMS, 200 in control group) female were recruited for the study. The 14- item Type D Scale) were used. **RESULTS:** NA ($p<0.0001$), SI ($p=0.03$) and Type D personality ($p<0.0001$) were significantly prevalent in the PMS group. A positive association between Type D personality and PMS ($p=0.02$, $OR[95\%CI]=2.05[1.08-3.86]$). **CONCLUSION:** There is a positive relationship between PMS and Type D personality. **KEY WORDS:** Premenstrual syndrome, personality type D, depression.

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CONCLUSION: There is a positive relationship between PMS and Type D personality.

KEY WORDS: Premenstrual syndrome, personality type D, depression.

What's already known about this topic?

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. Premenstrual sendrom (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.

Type D personality is a personality type characterized by negative affectivity and social inhibition. It is a general tendency to experience emotional distress characterized by the inhibition of the expression of emotions or behaviours in social relations and the predisposition to negative mood. Type D personality

has been reported to be associated to the presence of chronic disorders, cardiac disorders, chronic pain, fibromyalgia.

What does this article add?

There is no study investigating the role of Type D personality on PMS. Results suggest that Type D personality may affect the PMS status of women. We found significantly higher rates of Type D personality in the PMS population. 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.

INTRODUCTION

Premenstrual syndrome (PMS) is a periodic late luteal phase disorder of the menstrual cycle that causes physical, psychological as well as mental health symptoms that highly affect women's quality of life (1). Generally, PMS is seen in 50% -80% of women, while treatment is required in 30-40% of women (2). The etiopathogenesis of PMS is not fully understood. According to the research; It is observed that reproductive hormone release is normal in women with PMS, but these women have an increased sensitivity to cyclic variations in the levels of reproductive hormones that tend to experience mood and behavioral changes and somatic symptoms (3). In addition, the irregularity of the serotonin system has been shown in women with PMS. PMS causes significant behavioral changes that disrupt social relationships and daily activities. There is also a relation between PMS and negative psychological effects such as depression and anxiety (4).

Type D personality is characterized by negative effectiveness (NA) and social inhibition (SI). People with SI tend to be disabled, stressed and unsafe in social relationships due to fear of rejection by other individuals (5). Individuals with NA; tend to feel negative emotions such as dysphoria, depression, anxiety, tension, nervousness, anxiety, and unhappiness.

Studies have reported that type D personality is associated with chronic disorders such as cardiac disorders (6), chronic pain (7) , fibromyalgia(8). However, no studies investigating its role on PMS have been found.

PMS is seen in the community quite frequently. It affects the physiological well-being of the person and causes behavioral changes and disruption of daily activities. In this study, we aimed to investigate the relationship between PMS and D type personality.

METHODS

This study is a cross-sectional study and it was conducted between July and December 2018 at the Family Medicine outpatient clinic of an university hospital.

A total of 286 young female patients (18-23 years), 86 diagnosed as premenstrual syndrome -*the PMS group* , and 200 age and body mass index (BMI) matched healthy female without PMS -*the control group* , were collected to the study. PMS diagnosis was made by Premenstrual Syndrome Scale (PMSS); It is a 44-items lykert-type scale consisting of 9 subgroups. The scores received range from 44 to 220. As the score increases, PMS symptoms are considered to be increased. In our study, 102 was used as the cut-off score (9).

Participants with any chronic disease, chronic medication drug use and psychiatric disease and pregnancy were not included in the study.

A self-administered questionnaire including demographic characteristics, cycle characteristics (age at menarche, duration, volume, regularity, need for analgesic drug, traditional method use, etc.), habits (smoking, alcohol use), presence of sportive activity ([?]3 day per week) were applied to the participants for data collection.

Depression was evaluated using the 21-item Beck Depression Inventory (BDI-21) that measures the severity of depression. The scores given to the questions vary between 0 and 3. According to the answers given to the questionnaire, a total of 17-20 points are mild depression, 21-30 points are moderate depression, and 30 points or more are considered severe depression. People who score more than 17 are accepted depression (10).

Type D personality was evaluated using the DS-14 scale. The questionnaire consists of 14 questions evaluating 2 subscales (NA and SI) with 7 items. The answers given to each item are between 0 and 4 and the highest score is 28. Persons who scored ≥ 10 on NA and SI subscales were considered as Type D personalities.

Data analysis

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. Chi-square test was used for the comparison of the categorical data and shown as frequencies. The Pearson's rank correlation tests were performed to determine the relationships between continuous variables for parametric and nonparametric data, respectively. Regression analysis was used to clarify the impact of Type D personality on PMS.

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 XXX University with the number of 72867572.050.01.04-85338 at July 2018.

RESULTS

A total of 286 subjects (86 female in PMS group and 200 female in 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, sport activity (>3 days per week). 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 , $p=0.01$). Dysmenore was also significantly more prevalent in the PMS group (90.7%) than the controls (78.5%, $p<0.01$), as expected. 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 homogeneously between two groups ($p=0.8$, $p=0.6$, and $p=0.2$, respectively). Use of herbal medicine for dysmenore was similar between the groups ($p=0.07$), however, use of traditional method (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.

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

BDI-21 score was higher in the PMS group compared to the controls with a significant difference ($p<0.0001$). Depression was found in 26.4% (78/286) of the participants. Of those with depression, 10.1% (29/78) had mild depression, 9.1% (26/78) had moderate depression, and 7.2% (23/78) had severe depression. 53.5% (46/86) of PMS group had depression, and depression was found to be significantly more prevalent in the PMS group compared to the controls (14.5%, $p<0.0001$). When the severity of depression was compared between the groups, it was found to be severe in 39.1% (18/46) of the PMS group and 6.9% (2/29) of the control group. The severity of depression was also significantly more prevalent in the PMS group than the controls ($p=0.005$).

54% (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% (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% 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.

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

Correlation analysis showed a negative correlation between PMSS score and age at menarche ($r=-0.1$, $p=0.02$) and a positive correlation between PMSS score and the volume of menstruation ($r=0.1$, $p=0.04$), BDI-21 ($r=0.4$, $p<0.0001$), NA ($r=0.3$, $p<0.0001$) and SI score ($r=0.2$, $p<0.0001$). NA and SI scores were also strongly correlated with BDI-21 score ($p<0.0001$) (Data not shown). Regression analysis was performed to investigate the association between Type D personality and PMS. A positive association between Type D personality and PMS persisted after the adjustment of age, BMI, age at menarche, duration of menstruation and cycle, volume of menstruation, regularity of menstruation, smoking, alcohol, sportic activity ($p=0.02$, OR[95%CI]=2.05[1.08-3.86]). Depression ($p<0.0001$, OR[95% CI]= 6.23[3.28-11.85]) and volume of menses ($p=0.02$, OR [95% CI]=1.28 [1.03-1.6]) were also positively associated with the presence of PMS Table 3.

Table 3. Association between premenstrual syndrome and Type D personality

DISCUSSION

In this study, we aimed to determine the relationship between D type personality and PMS on 286 women (200 in the control group, 86 in the PMS group). As a result of the research, we found that there is a relationship between Type D personality and pms. NA, SI and Type D personality were significantly higher in women in the PMS group than in the control group. In addition, the frequency of depression and the severity of depression were also higher in women with PMS.

Premenstrual symptoms include mood, behavioral and physical symptoms that occur in a cyclic pattern before menstruation in women of reproductive age, and decrease after menstruation (11). Depressive symptoms can also be seen in the premenstrual period. Approximately 65% of women with unipolar depression experienced PMS (12). It is known that women have 2 times more major depressive disorders than men (13). According to studies, it was found that there is a significant relationship between depression risk and PMS (14). It is known that the rate of major depressive disorder in women is 2 times higher than in men worldwide (13). Similar results of increased rates of depression in those suffering from PMS have been found by other authors (15-18). Our results concur with previous findings as we observed presence of depressive symptoms to be associated with PMS. Depression was also found to be more severe in PMS group compared to the controls in the recent research. Studies and our results show that the relationship between pms and depression should be investigated.

Type D personality refers to individuals with a common tendency towards negative affectivity (NA) and social inhibition (SI). In studies conducted, it is stated that Type D personality traits are seen in 21-33% of the population (19). Relationships between Type D personality traits and diseases have been investigated in recent years.

This personality trait is linked to biological and behavioral mechanisms which may affect health. Neuro-endocrine and immunologic pathways have been investigated to explain the negative clinical outcomes for patients with Type D personality and increased pro-inflammatory immune activation (20), oxidative stress (6), and cortisol levels (21) found to be related to Type D personality. Type D personality is related to depression, anxiety, somatisation (22), dysregulated stress reactivity (23), sleep problems, psychosomatic symptoms, musculoskeletal pain (24), lower subjective quality of life (25), adverse health behaviours (26).

Although there are many studies evaluating the relationship between depression and PMS, this is the first study to examine the effect of Type D personality on PMS. In our study, a positive relationship was found between Type D personality and the presence of PMS. NA and SI scores were also strongly correlated with PMSS scores.

In studies performed, the prevalence of PMS and (Premenstrual dystrophic disorder) PMDD was found to be higher in young, physically inactive women, menarche age 12 or older and physically inactive (27-29).

Similar to previous studies, we found a negative correlation between PMSS score and menarche age in our study, but this negative effect disappeared in regression analysis. To exclude the effect of the factors that known to affect PMS via regression analysis could be the neutraulization of the association between age at menarche and the presence of PMS. 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 (30), a long menstrual duration and cycles (31). In our study, there was no significant relationship between the features of the menstrual cycle and PMS, but it was found that the menstrual bleeding volume was significantly higher in the pms group. 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, 32). Smoking and alcohol use during adolescent period has been found to be a risk factor for PMS (3, 32). 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 limitation is that the data of this study were obtained from participants through 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 aferomentioned limitations, an association between Type D personality and PMS was shown for the first time.

CONCLUSION

There is a positive relationship between PMS and depression, Type D personality. Large sample-sized studies are needed to better understand the mechanisms underlying the relationship. Knowing the personality type in patients with PMS can be useful for PMS management. It can also improve the patient’s quality of life and well-being.

Compliance with Ethical Standards

Disclosure of potential conflicts of interest

The authors declared no conflict of interest concerning the research, authorship, or publication of this article.

Research involving Human Participants and/or Animals

This research involved human participants’ data and authors include a statement that confirms that the study was approved by Suleyman Demirel University research ethics committee and certify that the study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki.

Informed consent

Informed consent was obtained from all individual participants included in the study.

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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/m ²) | 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 | 21 (10.5%) | 8 (9.3%) | 0.7 0.3 |
| Alcohol use | 30 (15%) | 9 (10.5%) | |

| | Control group (n=200) | PMS group (n=86) | p value |
|--|--|--|---------|
| 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* |
| <i>Type of analgesic use (n, %)</i> Nonsteroid | 77/91 (84.6%) 14/91 (15.4%) | 4/52 (82.7%) 9%52 (17.3%) | 0.8 |
| antiinflamatuar drug | | | |
| Antispasmodic | | | |
| <i>Duration of analgesic use</i> (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* |
| <i>Type of traditional method used (n, %)</i> Heat Coffee | 76/77 (98.7%) 1/77 (1.3%) | 45 (100%) 0 | 1 |

BMI: Body mass index.

*Statistically significant

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* |
| <i>Severity of depression</i> (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* |

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

*Statistically significant

Table 3. Association between premenstrual syndrome and Type D personality

| | β | p | OR | 95% CI for OR Lower | 95% CI for OR Upper |
|----------------------------------|---------|----------|------|------------------------|------------------------|
| Age at menarche | -0.25 | 0.07 | 0.77 | 0.59 | 1.02 |
| Volume of menstruation (pad/day) | 0.25 | 0.02* | 1.28 | 1.03 | 1.6 |
| Depression | 1.83 | <0.0001* | 6.23 | 3.28 | 11.85 |
| Type D personality | 0.71 | 0.02* | 2.05 | 1.08 | 3.86 |
| Constant | 0.45 | 0.8 | 1.57 | | |

Covariates: Age, body mass index, age at menarche, duration of menstruation and cycle, volume of menstruation, regularity of menstruation, smoking, alcohol, sportic activity, depression.

*Statistically significant