Personality and Primary Dysmenorrhea: A Study Using a Five-Factor Model in Chinese University Women

Kişilik ve Primer Dismenore: Çinli Üniversiteli Kadınlarda 5-Faktör Modeli Kullanılarak Yapılan Bir Çalışma

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Introduction

Dysmenorrhea is the most common gynecologic condition experienced by the menstruating women. Different from the secondary dysmenorrhea which refers to the painful menses that are associated with organic pelvic pathology, primary dysmenorrhea is characterized by a colicky, low abdominal pain associated with normal ovulatory cycles but not related to any specific problems with the uterus or other pelvic organs (1,2,3,4). The pain of primary dysmenorrhea often begins shortly before or at the onset of menses and lasts 1-3 days; this pain can be severe enough to limit normal activities or require medication (2).

As it is well acknowledged, there exists a close relationship between pain and depression. The prevalence of headache or neck-shoulder pain in a depressed sample and the prevalence of depression in a chronic pain sample are higher than the prevalence when these conditions are individually examined. For instance, on average, 85% of patients with depression experienced one or more pain complaints, and depression was present in 5% to 85% (depending on the study setting) of patients.
with pain conditions (5). On one hand, a national, community-based study conducted in Germany suggested a high association between migraine and specific anxiety (6). Other headache forms, e.g., chronic daily headache, displayed higher score on psychasthenia (7), and medication-overuse headache was more frequently comorbid with the obsessive-compulsive personality disorder (8). Moreover, distress or anxiety, as well as cognitive dysfunction, are closely linked with back pain (9). Personality characteristics have not been widely assessed in participants with dysmenorrhea. In addition, whether the participants enrolled in Bloom et al. study (10) incidentally suffered from anxiety or depressive disorder was not clearly stated, since depression and anxiety were highly related to menstrual symptoms (11).

Furthermore, in the personality research world, the five-factor model has proven to be the most reproducible trait measure (12,13), which can offer a common scale to evaluate psychopathology. To date, no study has employed the five-factor model, i.e. the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ) (14), to tackle personality traits in participants with dysmenorrhea. ZKPQ measures Neuroticism-Anxiety, Impulsive Sensation Seeking, Aggression-Hostility, Activity and Sociability traits. On the other hand, available instruments are designed to measure the frequency and magnitude of the dysmenorrheal pain (15). A more explicit measure is needed for the study of dysmenorrhea, since other investigators have also suggested that dysmenorrhea not only affects the physical health, but also limits women’s function and exaggerates their emotional responses (16,17). We have developed an inventory, the Functional and Emotional Measure of Dysmenorrhea (FEMD), which measures the two aspects with internal alphas of 0.90 and 0.86 in a sample of university women (18).

We asked a group of university women with dysmenorrhea (without comorbidity of anxiety or depression) and a group of healthy university women to undergo the FEMD and ZKPQ tests, in order to clarify whether pure dysmenorrhea women have some personality characteristics which can be defined by a five-factor model. The Plutchik-van Praag Depression Inventory (PVP) was also used to assess the depressive tendencies of these women. Based on the above literature, we hypothesized that women with dysmenorrhea would display higher traits of ZKPQ Neuroticism-Anxiety, which might be correlated with both FEMD Functional and Emotional scales.

**Methods**

**Participants**

This study was conducted in university women: 142 healthy volunteers (mean age, 20.0 years with 1.03 S.D., range: 18-23 years), and 49 primary dysmenorrhea sufferers (21.0±1.1, range: 18-23 years). Their mean ages were not significantly different from each other (t(1,127)=-0.71, p=0.48). Sufferers should meet the following inclusion criteria: a 12 to 72 hours colicky or dull pain in the lower abdomen during each menstrual cycle (for three consecutive menses), with or without nausea, diarrhea, fatigue or headache (2,3,19). All women were nonsmokers, had no pregnancy and abortion history, and were not using oral contraceptives. No organic diseases were found by the pelvic manual examination and ultrasound exam. Based on the Diagnostic and Statistical Manual of Mental Disorders, Version IV – Text Revision (20), women with depression or anxiety disorder were excluded from the study by one experienced psychiatrist (WW). No participants had ingested alcohol, drugs or medication for at least 72 hours prior to the test. The healthy women might experience a little pain during their menses, but were far from the diagnosis of primary dysmenorrhea.

The dysmenorrheal pain was firstly measured in each individual by a visual analogue scale, coded from 0-10. Pain was described as "mild" when a woman scored 0-2.5, "moderate" when scored 2.5-5, "severe" when scored 5-7.5, or "extreme severe" with a score of 7.5-10. The average duration of the (possible) menstruation pain (in hours) was noted in each woman, and the history of dysmenorrhea (in months) was also noted in the sufferers. Test participants had a score of less than 20 on PVP, and less than 3 on ZKPQ Infrequency scale (see below). This study protocol was approved by the local ethics committee and all participants gave their written informed consent.

**Measurements**

The participants also completed the following three questionnaires in a quiet room.

*The PVP*: It contains 34 items; each item has three scale points (0, 1, 2) which correspond to increasing depressive tendencies. Women have "possible depression" if they score between 20 and 25, or "depression" if they score more than 25 (21). The internal (Cronbach’s α) reliability of this inventory is 0.94 in Chinese population (22).

*The FEMD*: Fourteen FEMD items represent generally the emotional and functional responses to dysmenorrhea. The FEMD was administered using a paper-and-pencil format with a 5-point Likert scale: 1-very unlike me, 2-moderate unlike me, 3-somewhat like and unlike me, 4-moderate like me, 5-very like me. The functional scale had an internal (Cronbach’s α) reliability of 0.90, and the emotional scale had an internal (Cronbach’s α) reliability of 0.86 (18) (Attachment 1).

*The ZKPQ*: One point is given for each chosen item corresponding to personality traits. The test provides five measurements: (a) Impulsive Sensation Seeking (19 items), composed of two units, i.e. eight items of Impulsivity and 11 items of General sensation seeking; (b) Neuroticism-Anxiety (19 items); (c) Aggression-Hostility (17 items); (d) Activity (17 items); and (e) Sociability (17 items). In this questionnaire, 10 items of another scale of dissimulation (infrequency or lie) were randomly inserted into the test body. Any score above three on the infrequency scale suggests either inattention to the content of the items and acquiescence or a very strong social desirability set; therefore, the infrequency scale was used as a test validity indicator for individuals (14). This questionnaire has been proven to be reliable in Chinese population (23).

**Statistical Analysis**

The mean scores of each FEMD Functional and Emotional scale, and of each ZKPQ personality trait scale in the two groups were analyzed by a repeated ANOVA. Once a main effect was detected, post-hoc independent Student’s t-test was used to analyze the individual mean scale scores in the two groups. The mean PVP scores and durations of the possible menstruation pain in the two groups were analyzed by the Mann-Whitney U
test. The Spearman rank order correlation test was used to search for the relationship between the FEMD, ZKPQ, visual analogue scales, PVP, duration of the possible menstruation pain, and the history of dysmenorrhea among our women.

Results

No woman scored more than 20 on PVP; however, on average, the dysmenorrhea sufferers scored significantly higher on PVP than the healthy volunteers did (t (1, 189) = -5.96, p<0.00). In addition, the sufferers scored higher than the healthy women did on the visual analogue scale (t (1, 189) = -28.68, p=0.00) (Table 1). Their menstrual pain duration (median: 4 hours) was significantly higher (U=132.00, P=0.00) than that in the healthy women (median:0 hour). In our sufferers, 34.7% of them had history of dysmenorrhea longer than 60 months (median: 54 months).

The dysmenorrhea sufferers scored significantly higher on the FEMD scales (repeated ANOVA: group effect, F (1,189) 50357.65, p=0.00, MSE=50357.65; scale effect, F (1,189)=25.10, p=0.00, MSE=124.80; group X scale interaction effect, F (1,189)=44.99, p=0.00, MSE=223.75). Post-hoc Student’s t-test detected that the sufferers scored higher than the healthy women did on both the Functional and Emotional scales (Table 1).

Repeated ANOVA also detected significant differences between the ZKPQ scale scores in the two participant groups (group effect, F (1,189) = 9.55, p=0.02, MSE = 120.63; scale effect, F (4,756) = 25.97, p=0.00, MSE = 202.86; group X scale interaction effect, F (4,756) = 8.80, p=0.00, MSE = 68.75). The post-hoc Student’s t-test further detected that sufferers scored significantly higher than the healthy volunteers did on ZKPQ Impulsive Sensation Seeking (p=0.00) and Neuroticism-Anxiety (p=0.01) (Table 1). In dysmenorrhea sufferers, FEMD Emotional scale was significantly positively correlated with ZKPQ Activity (n=49, r=0.29, p=0.02). No other correlations were found in either group of participants.

Discussion

Besides experiencing more severe and longer pain during their menses, our sufferers scored higher on PVP and on ZKPQ Neuroticism-Anxiety than the healthy volunteers did. Although no woman scored higher than 20 on PVP, the dysmenorrhea sufferers showed a more depressive trend. These findings tend to agree with the former literature showing that dysmenorrhea sufferers were more depressed (24,25) and anxious (11). Our sufferers, in addition, scored significantly higher on ZKPQ Impulsive Sensation Seeking and on both FEMD Functional and Emotional scales than the healthy women did. In the sufferers, FEMD Emotional was positively correlated with ZKPQ Activity.

It is the first time that the responses to dysmenorrhea in subjective and objective aspects have been described separately. The results clearly demonstrate that dysmenorrhea had negative impacts on both functional and emotional features of the sufferers, which were in line with some epidemiological investigation (16,17,26,27,28).

The more severe pain as denoted by the higher score of the visual analogue scale and extended duration of menstruation pain in our sufferers might result from an excess or imbalance of prostaglandins, vasopressin, or other chemical substances derived from phospholipids, which are the commonly proposed causes of dysmenorrhea and are known to cause symptoms such as intense pain (25). For instance, the release of prostaglandins in the menstrual fluid causes uterine contractions and pain (19), and an elevated vasopressin level might also increase the uterine contractility and cause ischemic pain as a result of vasoconstriction (29). Supporting this premise is the observation that blocking the synthesis of prostaglandins with cyclooxygenase inhibitors is associated with a significant pain reduction in clinics (30).

These chemicals might underline the higher Neuroticism-Anxiety and PVP scores found in our sufferers. For instance, in the saliva of patients with major depressive disorder, the

Table 1. The mean scale scores (with SD) of the Plutchik-van Praag Depression Inventory, the visual analogue scale, the Functional and Emotional Measure of Dysmenorrhea, and the Zuckerman-Kuhlman Personality Questionnaire in healthy women (controls, n=142) and women with dysmenorrhea (n=49).

<table>
<thead>
<tr>
<th></th>
<th>Controls</th>
<th>Dysmenorrhea</th>
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<tbody>
<tr>
<td>Visual Analogue Scale</td>
<td>1.12±1.12</td>
<td>6.65±1.29*</td>
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<tr>
<td>Plutchik-van Praag Depression Inventory</td>
<td>7.28±5.54</td>
<td>13.10±6.84*</td>
</tr>
<tr>
<td><strong>Functional and Emotional Measure of Dysmenorrhea</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional scale</td>
<td>6.90±0.01</td>
<td>19.47±5.10*</td>
</tr>
<tr>
<td>Emotional scale</td>
<td>7.28±2.71</td>
<td>25.78±3.09*</td>
</tr>
<tr>
<td><strong>Zuckerman-Kuhlman Personality Questionnaire</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impulsive sensation seeking</td>
<td>8.15±3.26</td>
<td>9.24±3.39*</td>
</tr>
<tr>
<td>Neuroticism-Anxiety</td>
<td>6.32±3.06</td>
<td>9.37±2.25*</td>
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<tr>
<td>Aggression-Hostility</td>
<td>5.43±2.40</td>
<td>5.76±2.96</td>
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<tr>
<td>Activity</td>
<td>6.92±3.00</td>
<td>7.04±3.27</td>
</tr>
<tr>
<td>Socialibity</td>
<td>8.15±2.87</td>
<td>7.63±3.24</td>
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* p<0.05 vs. healthy women

Attachment. The Functional and Emotional Measure of Dysmenorrhea (FEMD)

<table>
<thead>
<tr>
<th><strong>FEMD Item</strong></th>
<th><strong>Description</strong></th>
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<tbody>
<tr>
<td><strong>Functional Scale</strong></td>
<td>I avoid traveling because of my dysmenorrhea</td>
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<td></td>
<td>I get tense (e.g. muscle tension) because of my dysmenorrhea</td>
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<td></td>
<td>I am unable to think clearly because of my dysmenorrhea</td>
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<td></td>
<td>I find it difficult to read because of my dysmenorrhea</td>
</tr>
<tr>
<td></td>
<td>I do not enjoy social gathering because of my dysmenorrhea</td>
</tr>
<tr>
<td></td>
<td>I find it difficult to focus my attention away from my dysmenorrhea and on other things</td>
</tr>
<tr>
<td></td>
<td>Because of my dysmenorrhea, I feel restricted in performing my routine daily activities</td>
</tr>
<tr>
<td><strong>Emotional Scale</strong></td>
<td>I feel desperate because of my dysmenorrhea</td>
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<td></td>
<td>Because of my dysmenorrhea, I feel handicapped</td>
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<tr>
<td></td>
<td>Sometimes I feel that I am going to lose control because of my dysmenorrhea</td>
</tr>
<tr>
<td></td>
<td>My dysmenorrhea places stress on my relationships with family or friends</td>
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<tr>
<td></td>
<td>My dysmenorrhea makes me feel confused</td>
</tr>
<tr>
<td></td>
<td>My outlook on the world is affected by my dysmenorrhea</td>
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<tr>
<td></td>
<td>No one understands the effect that my dysmenorrhea has on my daily life</td>
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</tbody>
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concentrations of prostaglandins (PGD2, PGE2, and PGF2α) were significantly higher than those of the healthy controls, suggesting the prostaglandins are related to the major depressive disorder (31). Other lines of evidence suggest that vasopressin plays a role in processing anxiety (32).

Another interesting finding is that our sufferers scored higher on ZKPQ Impulsive Sensation Seeking. Indeed, in clinics, some dysmenorrhea sufferers use or overuse medication (e.g. analgesics) to reduce the intensity of their menstrual pain (33,34). Some results have confirmed a strong association between impulsivity and drug abuse (35,36). Other research suggests that the sensation-seeking behavior increases the risks of drug use (37,38).

In dysmenorrhea sufferers, the FEMD Emotional score had a positive link with ZKPQ Activity score. One possible reason for the correlation might be that people with low moods would engage in self-management, and believe that being more active would improve their moods. Similar findings have been reported in people after joint replacement surgery (39).

There are some limitations of our study design, which should be kept in mind. Firstly, we only studied women with primary dysmenorrhea; the design would be more powerful if we included a patient group with another kind of pain such as primary headache. Secondly, we did not measure the disordered personality traits in our women, since some women with the borderline personality disorder frequently encounter the drug abuse problems. However, our study offers evidence that girls with pure dysmenorrhea do have pronounced Neuroticism-Anxiety and Impulsive Sensation Seeking personality traits.

References
