CHAPTER I

INTRODUCTION

Terminology for structures in the reproductive system can sometimes be confusing. Many researchers have recently moved toward labeling structures by their location or function rather than by their traditional names, which often refer to the physicians or anatomists who first recorded them. Thus, fallopian tubes, named for 16th century anatomist Gabriele Fallopian, may now be called oviducts or uterine tubes, which is more descriptive. Traditional names are still in common use, however. In this chapter, structures are referred to by both traditional and functional/locational names, so that practitioners trained in either terminology will feel at home.

FUNCTION AND STRUCTURE

The Female Reproductive System

Low in the female pelvis is two small structures called the ovaries. They are attached via the ovarian ligament to the uterus. The ovaries produce hormones, which are released into the bloodstream, and they produce eggs, usually one each month during ovulation, which are released into the peritoneal space. The fimbriae of the fallopian (uterine) tubes gently caress the ovaries, coaxing the egg toward them. Once inside tubes, the eggs make the 5-day journey to the uterus itself. If an egg is going to be fertilized, it will generally happen inside the uterine tube. When the egg reaches the uterus, it finds itself inside a hollow organ that is built of criss crossed layers of muscle.

The inside surface of the uterus, the endometrium, is made of delicate epithelial tissue that holds vast billowy supplies of blood to provide a nest for that fertilized egg. If the egg is not fertilized, the uterus sheds the blood and egg with it in the menses. Then it will
begin the process of building a new nest for next month’s candidate. The timing of the ripening and release of eggs from the ovaries and the building and shedding of the endometrial nest is under the control of the endocrine system. Hormones secreted from the ovaries themselves as well as the pituitary gland determine when and how these various events will happen. Birth control pills work by introducing artificial hormones into the blood. These trick the pituitary into believing that the woman is always pregnant, and so she never ovulates. The relationship between the reproductive system and the endocrine system is extremely tight; the female reproductive cycle is under the control of hormone secretions. Several of the conditions discussed in this chapter could be considered endocrine system disorders, but the tissue changes occur in reproductive system organs, so they are discussed here. Female reproductive conditions that have significance for massage therapists generally have to do with growths or local tenderness deep in the abdomen. Although working deeply in the vicinity of the uterus or ovaries is not generally practiced, sometimes these conditions can displace internal organs, making them vulnerable in places they would not ordinarily be found.

What are all these men doing in women’s health issues? The root word is me−n, which is Greek for “month.” Menarche is “me−n” plus “arche,” or “beginning.” Menstruation is “me−n” plus “atus,” meaning “to be menstruant.” Menses is the plural for “me−n”, meaning many months. Menopause is “me−n” plus “pausis,” or “cessation.

Menstruation is a woman’s monthly bleeding. It is also called menses, menstrual period, or period. When a woman has her period, she is menstruating. The menstrual blood is partly blood and partly tissue from the inside of the uterus (womb). It flows from the uterus through the small opening in the cervix, and passes out of the body through the vagina. Most menstrual periods last from three to five days (De dominico & Wood., 1997; Damjanou, 1996).
What is the menstrual cycle?

Menstruation is part of the menstrual cycle, which helps a woman's body prepare for the possibility of pregnancy each month. A cycle starts on the first day of a period. The average menstrual cycle is 28 days long. However, a cycle can range anywhere from 23 days to 35 days. The parts of the body involved in the menstrual cycle include the brain, pituitary gland, uterus and cervix, ovaries, fallopian tubes, and vagina. Body chemicals called hormones rise and fall during the month and make the menstrual cycle happen. The ovaries make two important female hormones, estrogen and progesterone. Other hormones involved in the menstrual cycle include follicle-stimulating hormone (FSH) and luteinizing hormone (LH), made by the pituitary gland (National Women's Health Information Center, 2002).

What happens during the menstrual cycle? In the first half of the menstrual cycle, levels of estrogen rise and make the lining of the uterus grow and thicken. In response to follicle-stimulating hormone, an egg (ovum) in one of the ovaries starts to mature. At about day 14 of a typical 28-day cycle, in response to a surge of luteinizing hormone, the egg leaves the ovary. This is called ovulation. In the second half of the menstrual cycle, the egg begins to travel through the fallopian tube to the uterus. Progesterone levels rise and help prepare the uterine lining for pregnancy. If the egg becomes fertilized by a sperm cell and attaches itself to the uterine wall, the woman becomes pregnant. If the egg is not fertilized, it either dissolves or is absorbed into the body. If pregnancy does not occur, estrogen and progesterone levels drop, and the thickened lining of the uterus is shed during the menstrual period (National Women's Health Information Center, 2002). In the illustration below, an egg has left an ovary after ovulation and is on its way through a fallopian tube to the uterus.
Menstrually related symptoms and disorders are multidimensional and affect diverse physiologic systems. Menstrually related symptoms have been reported in up to 80% of women (Hylan et al., 1999; Johnson et al., 1988; Campbell et al., 1997). Severe and debilitating symptoms that reach a severity of a disorder were reported in at least 3–10% of these women (Merikangas et al., 1993; Ramcharan et al., 1992; Tovar & Frank, 1990; Andersch et al., 1986). Recently (Wittchen et al., 2002) reported that the rate of clinically relevant symptoms was demonstrated to be even higher up to 18% of young women. Symptoms may be psychological or physical and involve multiple physiologic systems. Although over 300 different symptoms have been described, the majority of women experience about 20 core symptoms (Freeman, 1997; Hamilton et al., 1984; Halbreich et al., 1982).
Hormonal changes along the menstrual cycle

Since it is hypothesized that abnormalities of the menstrual process may underlie menstrually related symptoms, an understanding of the hormonal changes and actions associated with the menstrual cycle is fundamentally helpful. Hypothalamic gonadotropin releasing hormone (GnRH) stimulates the anterior pituitary to release follicle stimulating hormone (FSH) and luteinizing hormone (LH). FSH stimulates the initial secretion of estrogen by the follicles and LH further stimulates follicular development and full secretion of estrogen, triggers ovulation, promotes formation of the corpus luteum and stimulates the corpus luteum to produce estrogen and progesterone. Moderate levels of estrogen inhibit release of GnRH and secretion of LH and FSH. High levels of progesterone also inhibit GnRH and LH secretion. High levels of estrogen during the last part of the preovulatory phase can actually exert positive feedback on both the hypothalamus and anterior pituitary gland resulting in the LH surge that triggers ovulation; this positive effect of estrogen does not occur if progesterone is present at the same time (Halbreich, 2003).
PREMENSTRUAL DYSPHORIC DISORDER

Definition and Diagnosis

PMDD is listed in the DSM-IV as a "depressive disorder not otherwise specified." The symptoms of PMDD are remarkably similar to those of Major Depressive Disorder (MDD). Premenstrual Dysphoric Disorder (PMDD) is characterized by physical and psychological symptoms appearing in the luteal phase of the menstrual cycle. The symptoms often start at ovulation or shortly after and continue, mostly with an increase in severity, until bleeding starts. The severity of the symptoms reaches the highest levels during the last five premenstrual days and on the first days of bleeding and disappears within a few days after the bleeding starts (Bäckström et al., 2003). However, symptoms between cycles can vary within women in both onset and duration (Pearlstein et al., 2005). In the context of this thesis, it is important to distinguish between prospectively defined premenstrual dysphoric disorder and self-reported premenstrual syndrome (PMS). When asked prospectively, more than 90% of women report cyclicity in at least one symptom (mental or physical) during the menstrual cycle (Sveindottir & Bäckström, 2000). Two-thirds of women in reproductive age retrospectively report mental symptoms and feelings of body swelling during the premenstrual phase. Of these, 10.8% wanted to consult a physician because of their premenstrual symptoms (Andersch et al., 1986). However, only 2-6% of the women meet the prospective criteria for PMDD (Sveindottir & Bäckström, 2000) as defined by the Diagnostic and Statistical Manual of Mental Disorders, 4th edition, DSM-IV (American Psychiatric Association, 1994). In 2000, the DSM-IV was revised (DSM-IV-TR) with no changes in the diagnostic criteria for PMDD. Several twin studies suggest that there might be a hereditary component in premenstrual complaints (Kendler et al., 1998; Condon, 1993; Dalton et al., 1987; van den Aker et al., 1987) although environmental risk factors can also contribute to premenstrual symptoms. Most of these studies
retrospectively assess symptoms, an approach that should be considered when analyzing the data. Premenstrual symptoms appear to deteriorate as women age. In the Zurich 10-year prospective cohort study (Merikangas et al., 1993), a positive association between increase in premenstrual symptoms and increase in age (from 21 to 30 years of age) was noted. In a population-based study of women aged 18 to 44 years (Deuster et al., 1999), symptoms were most evident in women 25 to 34 years old (10.4%) compared to women 18 to 24 years old (8.7%) and women 35 to 44 years old (4.5%). Similar findings are reported in a study of women in their late twenties through mid-thirties, (Freeman et al., 1995a). As women approach menopause, the symptom severity seems to decline (Ramcharan et al., 1992). The most common symptoms reported by women with PMDD are irritability, depressed mood, anxiety, mood lability, and tension (Eriksson, 1999; Steiner et al., 1997; Hurt et al., 1992). These symptoms should be verified using prospective ratings because retrospective ratings are less valid. Many studies have demonstrated the discrepancy between retrospective reports of premenstrual complaints and reports based on daily prospective evaluation. Retrospective assessment favors recall of premenstrual symptoms, whereas symptoms at other times across the menstrual cycle are forgotten. Studies have shown that between 14 and 50% of women who complain about premenstrual symptoms do not show a true relation between the menstrual cycle and cyclicity of symptoms (Hurt et al., 1992). As well as confirming the presence of symptoms in the luteal phase, it is necessary to confirm the absence of symptoms in the follicular phase to distinguish the syndrome from other current mood disorders such as major depression, generalized anxiety disorder, and panic disorder. Patients with an underlying affective disorder can experience a premenstrual aggravation of their symptoms (Endicott, 1993). In addition to the presence of a number of typical symptoms in the luteal phase, the DSM-IV criteria also state that symptoms must interfere with usual activities (school, work performance, or interpersonal relationships).
Diagnosis of premenstrual-PMS&PMDD

The patient keeps a premenstrual Daily symptom diary for two to Three months

Are the patients symptoms Consistent with PMS? No Evaluate the The patient for Other physical And psychiatric disorders

Yes

Are the patient’s symptoms Restricted to the luteal phase Of the menstrual cycle? No

Yes

Do the patients symptoms Interfere with daily functioning? No premenstrual Symptoms

Yes

Evaluate the severity of the patient’s symptoms And refer to the diagnostic criteria for PMS and PMDD

PMS PMD
Confusing Terminology

During the past two decades, the terminology referring to premenstrual syndrome has changed several times. Originally, the term "premenstrual syndrome" was used although the diagnostic criteria varied substantially between researchers. Because there was a consensus for the need for prospective symptom ratings in the early 1980s, the first diagnostic criteria were established for what then was called the "late luteal phase dysphoric disorder" (LLPDD), a description found in the appendix of Diagnostic and Statistical Manual of Mental Disorder-III-R (DSM-III-R) (American Psychiatric Association 1987). Importantly, some researchers adhered to the term PMS while using the LLPDD criteria. Later the term LLPDD was changed to premenstrual dysphoric disorder (PMDD, in the beginning sometimes also abbreviated as PDD) in a following edition (DSM-IV) (American Psychiatric Association, 1994). As some women did not fulfill the criteria for PMDD but still required treatment for their condition, various descriptions for syndromes with less number of symptoms have been suggested such as "premenstrual dysphoria" (PMD) and premenstrual syndrome. Although PMS and PMDD have similar symptoms, they are recognized as two separate disorders. PMS is primarily associated with physical complaints, whereas PMDD is primarily attributed to mood problems that cause severe impairment to the woman's daily activities (Mishell, 2003). The hallmark symptom reported by a majority of women with PMDD is irritability (Bornstein, Dean & Endicott et al., 2003).

Research Criteria for Premenstrual Dysphoric Disorder

A. In most menstrual cycles during the past year, five (or more) of the following symptoms were present most of the time during the last week of the luteal phase, began to remit within a few days after the onset of the follicular phase, and were absent in the week post menses, with at least one of the Symptoms being either (1), (2), (3), or (4):
(1) Markedly depressed mood, feelings of hopelessness, or self-deprecating thoughts;

(2) Marked anxiety, tension, feeling of being “keyed up”, or “on edge”;

(3) Marked affective liability (e.g., feeling suddenly sad or tearful or increased sensitivity to rejection);

(4) Marked and persistent anger or irritability or increased interpersonal conflicts;

(5) Decreased interest in usual activities (e.g., work, school, friends, hobbies);

(6) Subjective sense of difficulty in concentrating;

(7) Feeling lethargic, easy fatigability, or marked lack of energy;

(8) Marked change in appetite, overeating, or specific food cravings;

(9) Hypersomnia or insomnia;

(10) A subjective sense of being overwhelmed or out of control;

(11) Other physical symptoms, such as breast tenderness or swelling, headaches, joint or muscle pain, a sensation of “bloating”, and weight gain;

B. Significant interference with work or school or with usual social activities and relationships with others (e.g. avoidance of social activities, decreased productivity and efficiency at work or school);

C. Feelings that are not merely an exacerbation of the symptoms of another disorder, such as major depressive disorder, panic disorder, dysthymic disorder, or a personality disorder; and

D. Criteria (A), (B), and (C) confirmed by prospective daily ratings during at least two consecutive symptomatic cycles.
Diagnostic Criteria for PMS and PMDD

Many women do not fulfill the DSM-IV criteria for PMDD although their symptoms are severe enough to influence their daily life and to seek medical treatment. For this reason, a definition of premenstrual syndrome was recently proposed by the American College of Obstetricians and Gynecologists (ACOG 2000). Although not employed in this thesis, the criteria are given for comparison. Premenstrual syndrome can be diagnosed if the patient reports at least one of the following affective and somatic symptoms during the 5 days before menses in each of the three prior menstrual cycles.

Table 1: Physical, Behavioral, and Mood Symptoms of Both PMS and PMDD

<table>
<thead>
<tr>
<th>Physical</th>
<th>Behavioral</th>
<th>Mood</th>
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<tbody>
<tr>
<td>Swelling</td>
<td>Hypersomnia/insomnia</td>
<td>Irritability</td>
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<tr>
<td>Body aches</td>
<td>Appetite changes</td>
<td>Mood swings</td>
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<tr>
<td>Breast tenderness</td>
<td>Poor concentration</td>
<td>Anxiety/tension</td>
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<tr>
<td>Headache</td>
<td>Social withdrawal</td>
<td>Depression</td>
</tr>
<tr>
<td>Bloating/weight gain</td>
<td>Decreased interest</td>
<td>Feeling out of control</td>
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Freeman (2003).

These symptoms are relieved within 4 days of the onset of menses without recurrence until at least cycle day 13. The symptoms are present in the absence of any pharmacologic therapy, hormone ingestion, or drug or alcohol use. The symptoms occur reproducibly during two cycles of prospective recording. The patient suffers from identifiable dysfunction in social or economic performance.
TABLE 2 : Differences between PMS and PMDD

<table>
<thead>
<tr>
<th></th>
<th>PMS</th>
<th>PMDD</th>
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<tr>
<td>Prevalence</td>
<td>75%</td>
<td>3-8%</td>
</tr>
<tr>
<td>Number of symptoms required</td>
<td>1</td>
<td>5 of 11</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>ICD-10*</td>
<td>DSM-IV</td>
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<tr>
<td>Social impairment</td>
<td>Not required</td>
<td>Required</td>
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<tr>
<td>Prospective charting</td>
<td>Not required</td>
<td>Required</td>
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Differential Diagnosis of PMDD

When evaluating a patient, the health care provider should ensure that a complete past medical history is obtained to identify any previous or underlying psychiatric disorders that could be recurring or undiagnosed (Johnson, 2004). The menstrual history should include the onset of menarche, the regularity of MCs, their duration, and the severity of bleeding. For example, if the MC is more than 36 days or is highly irregular, underlying disorders should be ruled out. The diagnosis cannot rely merely on a physical examination and laboratory tests such as a blood chemistry panel, a complete blood count, and serum TSH levels; however, these are conducted to rule out other disorders. Levels of reproductive hormones are not helpful in diagnosing PMDD due to the lack of evidence that hormone levels vary between women with PMDD versus women without PMDD. Table 3 lists diseases that must be ruled out in the differential diagnosis of PMDD.

Due to the similarity in symptoms between PMDD and depression, it is important that the clinician establish the proper
diagnosis for the patient (Landen & Eriksson, 2003). Key symptoms are similarly described for each disorder. Thus, it is crucial for patients to complete symptom diaries over several cycles to track the timing of the symptoms. Symptoms that are commonly noted in depression but not in PMDD include weight gain/loss and excessive feelings of guilt. These symptoms occur daily in depression, whereas PMDD symptoms are only present during the luteal phase and cease after the onset of menses. DSM-IV criteria for depression

<table>
<thead>
<tr>
<th>Table 3. Diseases/Factors That Must be Ruled Out for the Differential Diagnosis of PMDD (Halbreich, Backstrom, Eriksson et al., 2007: Kaur, Gonsalves, Thacker, 2004; American College of Obstetricians and Gynecologists, 2000)</th>
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<tr>
<td>Allergies</td>
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<td>Anemia</td>
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<td>Anxiety disorders</td>
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<td>Asthma</td>
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<td>Attention Deficit Disorder</td>
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<td>Hyperactivity Disorder</td>
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<td>Bipolar disorder</td>
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<td>Chronic depression</td>
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**Influence on Daily Life**

The main symptoms for PMDD are mental and affect daily living and wellbeing in a significant way. The impairment of the quality of life as well as the disability adjusted life years lost in PMDD is in the same magnitude as in depressive disorders (Halbreich et al., 2003; Pearlstein et al., 2000). The burden of PMDD has been estimated to 3.8 years of disability over the reproductive years for
each woman with PMDD (Halbreich et al., 2003). The premenstrual impairment may be more severe at home, affecting the relationship with family members more than social and work functioning (Chawla et al., 2002; Pearlstein et al., 2000; Robinson & Swindle, 2000; Brown et al., 1998; Campbell et al., 1997; Frank et al., 1993; Kuczmierczyk et al., 1992) found that women with PMDD and PMS had greater impaired work productivity without affecting the time at work, in the luteal phase. In a community-based study on 1045 women using telephone interviews regarding premenstrual symptoms and impact on functioning and treatment-seeking behavior, Hylan et al., (1999) reported that functional impairment was more significant at home than in social, school, or occupational situations. These findings point out that these women might increase their efforts to cope with their symptoms at work and in school and do not allow themselves to let it interfere until they are at home with their family. Women with PMDD often report that they experience a subjective feeling of altered cognitive functioning during the luteal phase with deteriorated concentration, attention, and memory (Man et al., 1999). Most studies on cognitive functioning in women with PMDD have not supported these findings. No differences were found in verbal learning and memory between women with prospectively diagnosed PMDD and controls; however, women with PMDD demonstrated slower psychomotor control in the late luteal phase (Resnick et al., 1998). Working memory was impaired in the luteal phase of the menstrual cycle with no significant differences between PMDD and control subjects (Man et al., 1999). PMDD women had significant difficulty in learning new material, but this problem was not phase-dependent and mood did not account for any of the differences in cognitive functioning (Keenan et al., 1992). Other studies have found no difference in cognition when comparing women with PMDD and controls (Morgan, Rapkin, 2002; Morgan et al., 1996; Rapkin et al., 1989). These studies suggest that although women with PMDD report subjective feelings of diminished cognition premenstrually, there is no
objective evidence that this is the case. Morgan and Rapkin also suggest that these complaints could be due to altered perceptions and sociocultural expectations. Data suggests that premenstrual mood symptoms increase the prevalence of suicidal thoughts and suicidal attempts during the premenstrual phase (Baca-García et al., 2004; Wittchen et al., 2002; Chaturvedi et al., 1995). One limitation to these studies is the retrospective diagnosis of the premenstrual symptoms, which influences the interpretability of these findings.

Pathphysiology of PMDD – Hormonal Aspects

The pathophysiology of PMDD is unclear, but the presence of ovarian hormones is considered crucial in the syndrome because during anovulatory cycles, when no corpus luteum is formed in the ovary, the symptoms do not appear (Hammarbäck et al., 1991). Progesterone has been suggested as the major symptom-provoking factor because of its temporal relationship with the luteal phase and its adverse mood effects during sequential hormone therapy in postmenopausal women (Andréen et al., 2005; 2003; Wihlbäck et al., 2005; 2001; Björn et al., 2003; 2002; 2000). When postmenopausal women are treated with estrogen-only, no negative mood effects are seen; however, when estradiol therapy is combined with progesterone or progestogens, negative mood symptoms appear (Andréen et al., 2006; 2005; 2003; Björn et al., 2000; Hammarbäck et al., 1985). In addition, estradiol appears to provoke premenstrual symptoms. Schmidt and co-workers evaluated women with PMDD and controls to measure mood response with respect to hormone levels. A GnRH analog, administered to obtain ovarian suppression, improved symptom ratings for the PMDD patients. When either estradiol or progesterone was added to the GnRH treatment, the negative symptoms returned in the PMDD patients, but not in the controls. This was interpreted as a general abnormal response to normal hormonal fluctuations in PMDD patients (Schmidt et al., 1998). In PMDD patients
high levels of luteal phase estradiol seems to be related to more severe symptoms (Seippel et al., 1998; Wang et al., 1996; Hammarbäck et al., 1989a). Furthermore, a higher dose of estrogen in combination with progestogen results in more negative effects on mood than a lower dose in postmenopausal women (Bjöörn et al., 2003). Most studies have found no difference in peripheral levels of progesterone and estradiol in the luteal phase between PMDD patients and controls (Girdler et al., 1993; Rubinow et al., 1988; Bäckström et al., 1983). Similarly, no differences in follicle-stimulating hormone (FSH), luteinizing hormone (LH), prolactin, testosterone, or cortisol have been reported (Girdler et al., 1993; Rubinow et al., 1988; Bäckström et al., 1983) however, in some studies on women with PMDD, higher levels of testosterone are evident compared to controls (Eriksson et al., 1994; 1992). Although women with PMDD appear not to have higher stress levels (Beck et al., 1990), they are less tolerant to stress than other women (Deuster et al., 1999; Girdler et al., 1998). Hypothalamus, the pituitary gland, and the adrenal glands (HPA-axis) regulate the body’s response to stress. The adrenal hormone cortisol, which is a glucocorticoid hormone, plays a key role in stress reduction by its effect on several body systems. Both over-activity and under activity of the HPA-axis function are associated with depressive mood states and aggressive behavior (Stansbury & Gunnar, 1994; Yehuda et al., 1993). Reduced HPA-axis activation has been documented among women with PMDD in several studies (Redei, Freeman, 1993; Roy-Byrne et al., 1986) and women who felt more depressed premenstrually had lower salivary cortisol levels compared to postmenstrual days (Odber et al., 1998).

Pathophysiology of PMDD – Psychiatric Aspects

There are similarities between PMDD and affective disorders like major depression, generalized anxiety disorder, and panic disorder (PD) (Yonkers et al., 1997a, b). Compared to controls, the lifetime prevalence of depressive disorder and postpartum
depression is increased in women with PMDD (Hurt et al., 1992; Pearlstein et al., 1990; Endicott & Halbreich, 1988). The prevalence of life-time history of major depressive disorder in women with PMDD is reported to be between 30-80% (Harrison et al., 1989; Halbreich & Endicott, 1985). PMDD in itself has also been suggested to be a risk factor for future major depressive disorder (Hartlage et al., 2001; Graze et al., 1990). Apart from the similarities between PMDD and major depression, PMDD patients also share several common biological vulnerabilities with PD patients. Exposure to different anxiety-producing agents like lactate, CO2, and cholecystokinin (CCK) induce panic attacks in both women with PD and women with PMDD (Gorman et al., 2001; Le Mellédo et al., 1999; Facchinetti et al., 1992). A possible influence of gonadal hormones has been suggested since panic symptoms seem to increase in the post-partum period (Northcott & Stein, 1994) and in the late premenstrual period (Yonkers et al., 1997c) with decreasing levels of progesterone. During pregnancy, a time of high levels of both estrogen and progesterone, improvement in PD has been reported (Cohen et al., 1994), although this result was not confirmed in a following study (Cohen et al., 1996). A greater respiratory variability among subjects with PD has been seen at baseline (Abelson et al., 2001; Gorman et al., 1988) and during carbon dioxide (CO2) challenge (Bystritsky et al., 2000). Similar changes in respiratory variability has been seen both at baseline (Martinez et al., 2001) and after CO2 inhalation among women with PMDD compared to control subjects (Martinez et al., 2001; Bystritsky et al., 2000). In addition, both PMDD and PD patients display a reduced sensitivity to a benzodiazepine challenge (Le Mellédo et al., 2001; Sundström et al., 1997a,b; Roy-Byrne et al., 1990), and both disorders respond to SSRIs (Freeman et al., 1995b; Steiner et al., 1995; Modigh et al., 1993; Harrison et al., 1990; Ballenger et al., 1988). Another area of research that has gained increasing interest is the prevalence of sexual abuse and domestic violence in women with PMDD. Golding & Taylor (1996), using two
survey data sets with 948 and 619 women, found an association between retrospective reports of premenstrual distress and repeated assaults by the same offender Golding et al., (2000), in a prospective interview of 42 women with confirmed PMDD, found that 40 out of 42 women reported at least one attempted or completed sexual assault. Paddison et al., (1990) interviewed 174 women seeking treatment for prospectively defined premenstrual symptoms about their history of sexual abuse; 40% of these women had been sexually abused. These findings suggest that there is a strong association between earlier traumatic events and premenstrual symptoms. Finally, Girdler and colleagues reported that women with PMDD with a history of sexual abuse are distinct from other women with PMDD and from women without PMDD in terms of variability and mean hormone concentrations of hypothalamus-pituitary-thyroid axis variables.

CONCLUSION

Treatment

There are two main pharmacological treatments for PMDD: 1) the induction of anovulation or 2) modulation of serotonergic transmission. Both options have benefits and adverse effects. There are several ways to induce anovulation, such as GnRH agonist treatment (Hammarbäck et al., 1988) high doses of estrogen (Watson et al., 1989), danazol (Halbreich et al., 1991), medroxyprogesterone in high doses (Kaunitz, 1998), and surgical oophorectomy (Casper & Hearn, 1990). In this work, I have only focused on GnRH agonists and SSRIs.

SSRIs

Serotonin (5-hydroxytryptamine, 5-HT) is a neurotransmitter used by many neurons throughout the brain. Serotonin may influence aggression, impulse control, anxiety, sexual behavior, pain, sleep, and appetite (Spigset, 1997). Serotonin alters the function in different neurons by altering the rate of signaling and also modulates the
release of other neurotransmitters. Several studies have indicated that serotonin reuptake inhibitors (SSRIs) are effective in treatment of PMDD (Cohen et al., 2002; Dimmock et al., 2000; Freeman et al., 1999; Wikander et al., 1998; Yonkers et al., 1997c; Steiner et al., Pearlstein et al., 1997; 1995; Eriksson et al., 1995; Sundblad et al., 1992) and these compounds are now considered as a drug of choice. SSRIs reduce symptoms like irritation and depressed mood (Wyatt et al., 2002; Steiner et al., 1999; Pearlstein et al., 1997; Eriksson et al., 1995; Sundblad et al., 1992) but also seem to have an effect on physical symptoms like breast tenderness and bloating (Freeman et al., 1999; Eriksson et al., 1995). Typically, treatment with SSRIs results in improvement in psychosocial functioning, quality of life, and work capacity (Steiner et al., 2003; Pearlstein et al., 2000). Intriguingly, the mechanism of action seems to be different from the mechanism by which the SSRIs alleviate symptoms in major depression. When used for treatment of depression, the lag phase (time from onset of treatment to treatment effect) for SSRIs are usually 4-8 weeks (Freeman et al., 1999; Wikander et al., 1998). When used for PMDD, only a few days are needed until symptom improvement is noted (Steiner et al., 1995). The treatment is effective also when given intermittently, during the luteal phase (Freeman et al., 2005, 2004; Cohen et al., 2002; Halbreich et al., 2002; Jermain et al., 1999; Young et al., 1998; Wikander et al., 1998; Halbreich & Smoller, 1997; Sundblad et al., 1993), and data suggests that intermittent treatment might be even more effective than continuous treatment (Wikander et al., 1998; Steiner et al., 1997). Intermittent dosing supposedly minimizes the adverse effects (Steiner et al., 1997; Sundblad et al., 1997) and is also more cost beneficial.

Keeping in view what has been said in the preceding paragraphs current study intends to examine: A COMPARATIVE STUDY OF THE EFFECT OF YOGA THERAPY, COGNITIVE-BEHAVIOR THERAPY AND PHARMACOTHERAPY ON PREMENSTRUAL DYSPHORIC DISORDER AMONG IRANIAN COLLEGE STUDENTS.