Research Article

The Effects of Sertraline on Premenstrual Tension Syndrome

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Received date: *August 24, 2017;* ***Accepted date:*** *December 08, 2017;* ***Published date:*** *December 12, 2017*

ABSTRACT

Background: Premenstrual Dysphoric disorder (PMDD) is a serious kind of premenstrual syndrome (PMS) that causes significant distress and interferes with normal operation. PMS disturbs about 75% of women of reproductive age.

Aim: The purpose of this work is to test the effect of Sertraline, Selective Serotonin Reuptake Inhibitors on electroencephalographic (EEG) patterns, and clinical manifestations in females with premenstrual tension syndrome.

Patients and methods: This prospective observational study was conducted on 200 female participants. Patients will be subdivided into two groups: Group A (control): includes 80 normal females and Group B consists of 120 patients with PMS. Patients with PMS were given sertraline 50 mg/day orally, initiated 14 days before the expected onset of menses and discontinued the day menses began. All patients were admitted in the study was less than 35 years old, have a BMI between 20 and 30, having regular cycles, not using drugs. The following methods were undertaken for each patient: Full history. Complete clinical examination, EEG was done twice for each patient, firstly, on the 7th day of the cycle (follicular phase) and secondly on day 21 of the cycle (luteal phase).

The results: The present study confirmed the presence of a significant difference in frontal alpha asymmetry between PMS and non-PMS women. Moreover, we found that sertraline has no significant effects on EEG findings, but relieved the clinical symptoms.

Conclusions: We strongly support the effectiveness of SSRIs in the treatment of PMS.

Keywords: Electroencephalogram, premenstrual dysphoric disorder, premenstrual tension, premenstrual syndrome, SSRI, sertraline.

BACKGROUND

Premenstrual syndrome (PMS) is defined as a combination of physical and mood disturbances that take place in the last half of a woman's menstrual cycle after ovulation which normally ends with the menstrual flow. Premenstrual Dysphoric disorder (PMDD) is a severe form of premenstrual syndrome. PMDD occurs in 3% to 8% of menstruating women [1] . Epidemiologic surveys have estimated that 75 percent of women of reproductive age, experience some symptoms attributed to the premenstrual phase of the menstrual cycle. Most adult females are able to treat these symptoms through lifestyle changes and conservative therapies [2].The American Psychiatric Association has established formal guidelines for the diagnosis of PMDD in their Diagnostic and Statistical Manual (DSM-IV). The DSM-IV diagnostic criteria of PMDD require prospective documentation of symptoms being present for at least two consecutive menstrual cycles. At least one affective and one somatic symptom must be present and symptoms are relieved within 4 days without recurrence until cycle day 13 [3]. Some EEG study of adult females with PMS demonstrated that Frontal EEG asymmetry was recorded at rest and during affective picture viewing, once during lateral and once during follicular phases, in counterbalanced order [4]. El-Gharib and associated concluded that that resting luteal phase of EEG frontal asymmetry must be added to the research criteria for PMDD (DSM-IV-TR) [5]. Serotonin is a monoamine neurotransmitter. Biochemically derived from tryptophan, serotonin is primarily found in the gastrointestinal tract, blood platelets, and the cardinal nervous system. It is popularly thought to be a contributor to feelings of well-being and happiness

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DOI:

10.4103/2278-960X.194507

[6].Evidence implicates the serotonergic system, in particular in the pathogenesis of premenstrual dysphoric disorder, which is considered to be associated with symptoms such as irritability, depressed mood, and carbohydrate craving [7]. Selective serotonin reuptake inhibitors (SSRIs) are considered to increase the extracellular levels of the neurotransmitter serotonin by inhibiting its reuptake into the presynaptic cells and thus increasing the measure of serotonin available to attach to the postsynaptic receptor. SSRIs are most usually used as antidepressants and anxiety disorders [8]. Numerous studies with a double-blind, randomized, confirm that SSRIs improves the quality of life of women with PMDD [9]. The main aim of this work is to study the effect of Selective Serotonin Reuptake Inhibitors on electroencephalographic patterns, and clinical manifestations in females with premenstrual tension syndrome.

PATIENTS AND METHODS

This prospective observational cohort study was conducted on 160 women from those serving the Department of Obstetrics and Gynecology, Tanta University Hospital. Recruitment of the chess sets out in November 2015 and was completed in July 2016.The two hundred patients included in this open area, subdivided into two groups: Group A (control):includes 80 normal females and Group B (patient): includes 120 patients with premenstrual tension syndrome. All patients were included in the study was less than 35 years old, have a BMI between 20 and 30, having regular cycles, not using drugs (particularly ovulatory induction drugs, hormonal contraception, serotonin reuptake inhibitors and other drugs affecting CNS) during the last six months, do not cause neurological or psychiatric problems, if they owned a previous operation of the brain or spinal cord. All patients submitted to the study were counseled thoroughly about the procedure including nature, value, and fates of the investigation and the aim of the study. After this, a written consent will be obtained and signed by the patient. We did not receive any funds, from any individual or institution. If the patient refused to complete the study, she was contracted away and replaced by another one from who are satisfying the inclusion criteria of the study. We did not classify the patients according to their religious belief or culture or race or any other inside information. Once women were admitted in the study, they were asked about their current phase of the cycle, by calculating backward from the starting day of the next expected period. PMDD was diagnosed by the daily symptom report [10]. Patients with PMS were given sertraline 50 mg/day orally, initiated 14 days before the expected onset of menses and discontinued the day menses began.

METHODS:

The Following Methods Were Undertaken For Each Patient:

- ● Full story.
- ● Performing thorough clinical general.
- ● obtaining routine investigations.
- ● Electroencephalography (EEG). EEG was recorded using (NIHON KHODEN Machine, EEG 9000 version 0.5-71 Japan).

Firstly, we prepared and clean the scalp of the patient from oil and any debris or draft, Then 21 sliver-chloride electrodes were applied to the head surface and they were adherent to the scalp by using an adhesive conductive paste (10-20 paste). These electrodes were put on to the scalp according to 10-20 system. Hyperventilation and photic stimulation were applied as a provocation methods during EEG recording. These signals from the surface electrodes will pass through an amplifier that converts them from parallel to digital ones which can be displayed and stored in a computer [11]. EEG was performed twice for each patient, firstly, on the 7th day of the cycle (follicular phase) and secondly on day 21 of the cycle (luteal phase.)

THE RESULT

The results of this study are depicted in 6 tables and 5 figures.

DISCUSSION

The contemporaneous study showed a significant difference in frontal alpha asymmetry between PMS and non-PMS women and a difference between right and left hemisphere alpha activities in the luteal phase. In addition, negative affect and somatic depression were related to frontal alpha asymmetry. In that placement were more severe premenstrual distress and depressive symptoms during the luteal phase than during the follicular phase, as well as more severe premenstrual distress and depressive symptoms in PMS than in non-PMS [Tables 1-3 and Figures 1-3].

		Number	Range	Mean	± SD
Age	Control group	80	20-35	27.525	4.7447
	PMS group	120	21-34	27.325	4.6233
BMI	Control group	80	22-28	25.075	2.0049
	PMS group	120	21-27	25.025	2.0231

Table 1: Age and body mass index of the studied patients.

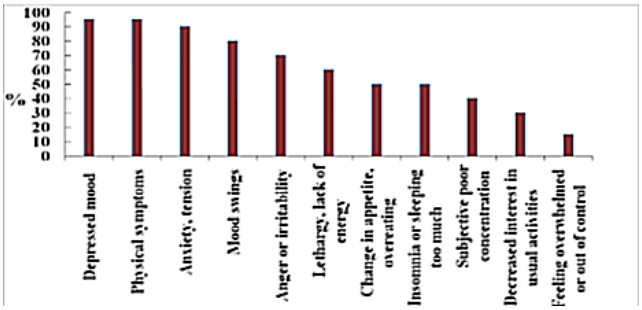

Figure 1: The frequency of symptoms among subjects with premenstrual tension syndrome.

Variables	With PMS/PMDD -120	Without PMS/PMDD (80)	t. test or X2	P. value
Present age (in years)	27.3 ± 4.985	27.75 ± 4.61	0.6349	0.2241
Age at menarche (in years)	13.05 ± 1.395	13.3 ± 1.455	0.4751	0.8519
Number of bleeding days	5.9 ± 1.165	5.7 ± 1.129	1.3248	0.1141
Length of cycle (in days)	26.65 ± 2.455	25.85 ± 2.641	1.9651	0.2239
Number of years with premenstrual Symptoms	3.3 ± 0.801	3.25 ± 0.786	0.8589	0.9511
Dysmenorrhea:				
Yes	102	56	2.0411	0.1519
No	18	24		
The Intensity of dysmenorrhea:				
Mild	78	40	0.621	0.7321
Moderate	30	28		
Severe	12	12		
Family history:				
Yes	108	48	5.149	0.024
No	12	32		

Table2: Reproductive characteristics of study subjects.

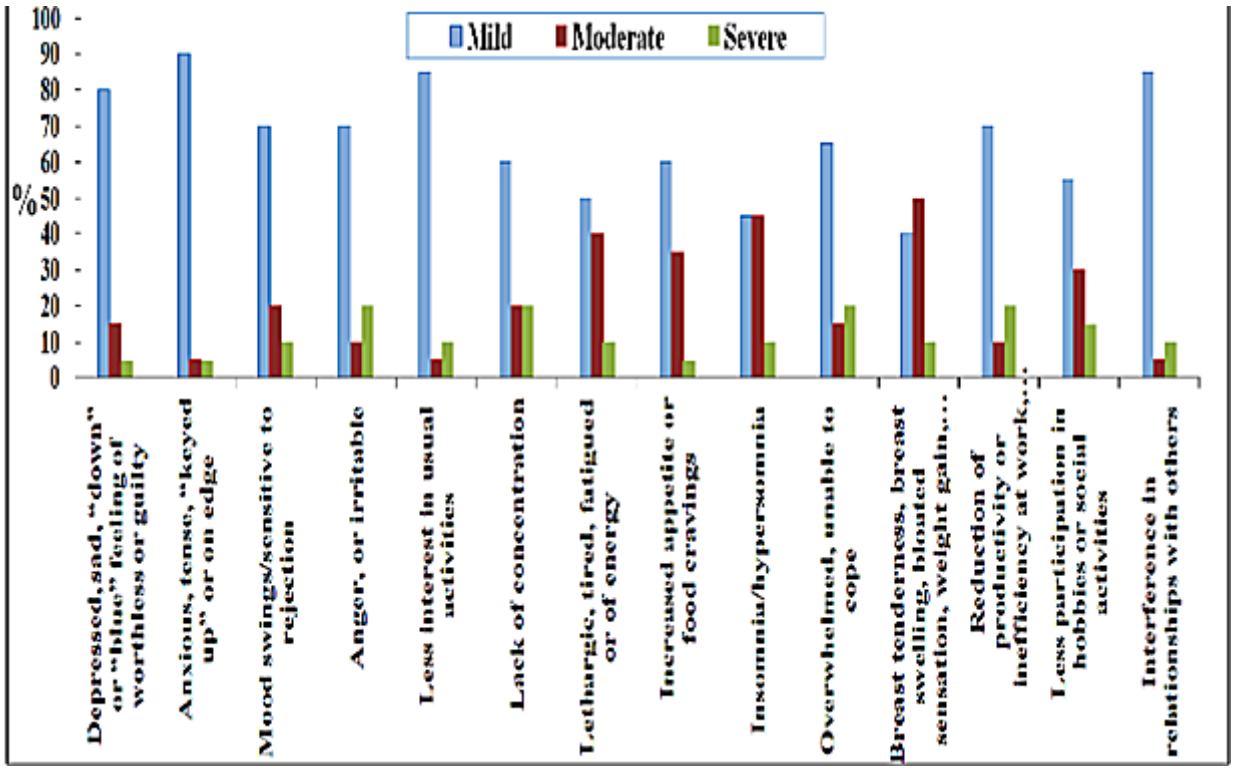

Figure 2: Premenstrual symptoms in PMS / PMDD patients, according to severity.

	Mild		Moderate		Severe		X2	P.
	N	%	N	%	N	%	value	
Depressed, sad, "down" or "blue" feeling of worthless or guilty	96	80	18	15	6	5	4.2529	0.0151
Anxious, tense, "keyed up" or on edge	108	90	6	5	6	5	2.6319	0.0511
Mood swings/sensitive to rejection	84	70	24	20	12	10	7.5261	0.0489
Anger, or irritable	84	70	12	10	24	20	2.6321	0.0949
Less interest in usual activities	102	85	36	5	12	10	5.4119	0.0091
Lack of concentration	72	60	24	20	24	20	3.1471	0.0279
Lethargic, tired, fatigued or of energy	60	50	48	40	12	10	152	0.147
Increased appetite or food cravings	72	60	42	35	6	5	1.2011	0.3319
Insomnia/hypersomnia	54	45	54	45	12	10	0.3019	0.1141
Overwhelmed, unable to cope	78	65	18	15	24	20	2.8851	0.0159
Breast tenderness, breast	8	40	60	50	12	10	4.5229	0.0271

swelling, bloated								
sensation, weight gain,								
headache, joint or								
muscle pain, or other								
physical symptoms								
Reduction of								
productivity or								
inefficiency at work,	14	70	12	10	24	20	5.6389	0.021
school, home or in daily								
routine								
Less participation in								
hobbies or social	11	55	36	30	18	15	2.031	0.0119
activities								
Interference in	17	85	6	5	12	10	2.3359	0.0741
relationships with others								

Table 3: The Prem.

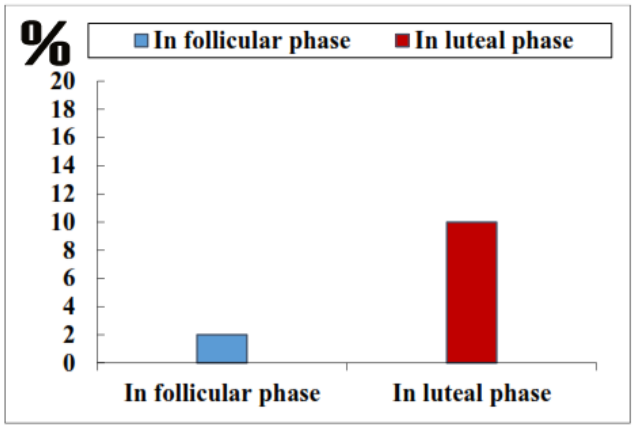

Figure 3: EEG patterns, ratio in premenstrual tension syndrome in patient during follicular and luteal phases.

In judgement with previous studies, [4] the present study examined the participants' EEG not only under the resting baseline, but also during the depressive induction and relaxation conditions. According to the Davidson's theory, frontal alpha asymmetry reveals relatively higher left than right frontal alpha activity during depressive moods in major depressive disorders. Furthermore, Baehr et al. & Accortt et al., [12] also confirmed higher left than right frontal alpha activity under the resting baseline in a diagnostic PMDD group. The finding of this study and those of the previous studies concur that frontal alpha asymmetry significantly differed between PMDD and non-PMDD. All the participants of the present survey are of childbearing age and experienced regular menstrual cycles. We propose that the difference found in frontal alpha asymmetry may be made by one of the pathophysiological mechanisms underlying PMS. This agrees with the findings of Davidson [13] who indicated that frontal alpha asymmetry was related to metabolic activity in the amygdala (part of the limbic system), which was linked to emotion regulation. In the existing study, we found no significant correlation between EEG findings and the clinical manifestation of PMS [Tables 4-6 and Figures 4 and 5]. Numerous treatment modalities have been shown to be effective in the treatments of PMS, and counseling, including psychotherapy, medications as SSRIs (selective serotonin reuptake inhibitors). SSRIs are the most effective medication available at the present for treating PMDD, hormonal therapies, including oral contraceptive pills, danazol, GnRh analogue, progesterone, progestogens and surgical removal of the ovaries [14]. Selective serotonin reuptake inhibitors (SSRIs) are currently considered the most effective pharmacologic class for the treatment of symptoms related to severe premenstrual syndrome (PMS) and its most intense form, premenstrual Dysphoric disorder [15]. Despite the conduct of systematic reviews supporting SSRI efficacy, sources of heterogeneity between studies have not been elucidated in prior meta-analyses [16]. The SSRIs, including sertraline, represent an important advance in the pharmacotherapy of mood and other disorders. They are chemically unrelated to tricyclic, heterocyclic, and other first-generation antidepressants. SSRIs are the treatment of choice for many indications, including premenstrual dysphoric disorder, because of their efficacy, good side-effect profile, tolerability, and safety in overdose, as well as patient compliance [17]. In

the current study, we gave sertraline drugs for treating cases with PMDD in a dose of 50 mg once daily starting from the 14th days till menstruation occurred, for 3 cycles. We found amelioration of symptoms in 60% of cases. These results come to an agreement with the results of several authors [18-20]. Opportunely, we did confront with any side effects to sertraline administration. This differs from the results of other authors [21-23] . To finish, we conclude that sertraline is an effective medicament for PMDD.

	Number of patients	No of Abnormal EEG	%
PMS	102	60	58.82
PMMD	18	6	33.33

Table 4 : Comparison between EEG finding in PMS and PMDD cases.

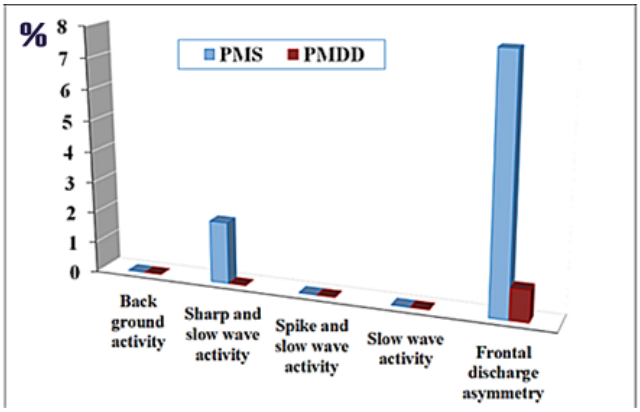

Figure 4: The abnormal EEG finding in study group.

	PMS	PMDD
Background activity	0	0
Sharp and slow wave activity	12	0
Spike and slow wave activity	0	0
Slow wave activity	0	0
Frontal discharge asymmetry	48	6

Table 5: Abnormal EEG finding in study group.

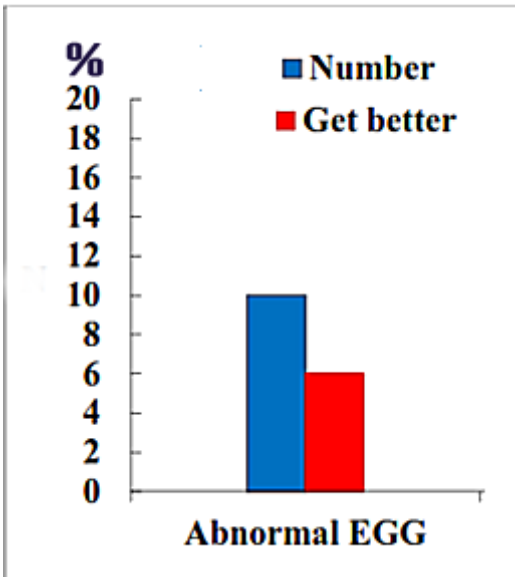

Figure 5: The Effects of Selective Serotonin Reuptake Inhibitors on EEG Findings in Females with Premenstrual Tension Syndrome.

Changes in EEG were found in about 50% of the cases

	Number	Get better
Abnormal EEG	60	36

Table 6: The Effects of Selective Serotonin Reuptake Inhibitors on EEG Findings in Females with Premenstrual Tension Syndrome.

DECLARATION OF INTREST:

The author reports no conflicts of interest. The author alone is responsible for the content and writing of the paper.

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