Prevalence of Premenstrual Syndrome in Medical Students: Impact on Cognitive Functions

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Premenstrual syndrome (PMS) has been claimed to be one of the most commonly encountered health problems. It affects an important sector of the population in the age group of education, production and reproduction. The aim of this work is to study the effect of PMS on some cognitive functions in medical students. A comprehensive sample of the students of the Faculty of medicine, Suez Canal University, was divided into PMS (positive) and PMS (negative) using the Menstrual Distress Questionnaire (MDQ). Attention, concentration, and memory functions were evaluated using tests derived from Wechsler Adult Intelligence Scale (WAIS). The tests were undertaken pre - and post-menstrual, and the results were compared. Statistically significant changes in all the tests were found in the PMS + ve group, while this was true only for the word recognition test in the PMS - ve group. Regression analysis of post-menstrual scores as dependent factor, and PMS scores, premenstrual test results, and some personal and socio-economic characteristics as independent factors, has shown that only PMS, and pre-menstrual scores were significant. More concern about the prevention and management of this syndrome is recommended. It should be considered in some Job assignments.

(Egypt.J. Psychiat.,1993,16:106-112).

Introduction

The premenstrual syndrome (PMS) has been described as one of the world's commonest diseases (Dalton, 1977). Epidemiological data estimated that as many as 70 to 90 percent of female population admitted having recurrent premenstrual symptoms, and that 20 to 40 percent had some degree of mental and physical incapacitation (Sharma, 1982). In Egypt, Amin et al. (1989) reported a prevalence rate of 8.1 to 47.2 percent, according to severity. Another study in Suez Canal area claimed a prevalence rate of 69.6 percent (El-Defrawi, et al, 1990). Many psychological and behavioral symptoms were reported to be associated with PMS, mostly in the form of depression, anxiety, and even suicidal attempts (Dalton, 1982). These symptoms could affect women whether they are school girls, workers, or housewives, and might lead to fluctuations in cognitive functions extending throughout menstrual years. This might have negative impacts on scholastic performance, productivity and occupational health, as well as social life and family integrity. In face of the psychiatric, behavioral, and cognitive consequences of these monthly occurring changes, DSM-

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III-R (APA, 1987) has suggested late luteal phase Dysphoric Disorder (LLPDD) as a distinct diagnostic category including cognitive dysfunction as one of the diagnostic criteria. Epidemiological studies dealing with PMS and neuropsychological functions are scanty. This study aimed at the assessment of some cognitive functions among medical students to clarify the influence of PMS on these abilities. The hypothesis to be tested was that students without PMS (PMS negative) would have better performance cognitive functions tested compared to those with PMS (PSM positive).

Subjects and Method

This study was conducted at the Faculty of Medicine, Suez Canal University. The study population consisted of all female students in this faculty. They constitute a stable population suitable for the follow-up design chosen for the study. Also, medical students were expected to have a better response in such a sensitive study, than others. Any student in the reproductive period, with regular cycles, was eligible. Exclusion criteria included pregnancy, lactation, and hormonal therapy. The number of eligible subjects turned to be 159. All of them were included in the study.

Instruments for data collection included a questionnaire for personal, medical, and socioeconomic data, a diagnostic questionnaire for PMS (Moos, 1968), and tests for evaluation of cognitive functions derived from Wechsler Adult Intelligence Scale (WAIS).

The PMS diagnostic questionnaire is a modified version of the Menstrual Distress Questionnaire (MDQ). It includes a checklist of symptoms, each converted to a question scored along a 4 point scale for severity. These symptoms were categorized into somatic, cognitive, psychological, and interpersonal relationship.

The WAIS, from which tests of cognitive functions were derived, is one of the most frequently used, and standardized tests of intelligence. Three functions were measured in this study: attention, concentration, and memory. Attention was measured by two forms of digit forward and digit backward test. Concentration was assessed by different forms of the omission test, (Cancellation test) (Dillers et al, 1974 & Diller and Weinber 1977) and memory by word recognition, and digit symbols subtests. (Wechsler, 1974 Lezak, 1985)

Interviewers were trained to administer the questionnaire and carry out the test, and their reliability was tested by a psychiatrist. A pilot study was done to test the study instruments, the reliability of the interviewers, and to estimate the prevalence of PMS. Then, in the main study, subjects were diagnosed as having or not having PMS, and data were obtained about the menstrual cycle in order to identify the time for pre- and postmenstrual evaluation of cognitive skills. The observer was also blind as regards the PMS status of the tested subject.

Data were analyzed using the Statgraphics software computer program. Paired t-test was used to compare pre-post scores. Unpaired t-test was used to compare the scores of subjects with and those without PMS. A stepwise backward regression analysis was done to study the combined effects of independent factors on the tests scores.

The total number of eligible subjects was 159. Six were excluded because they had definite irregular menstrual cycles. A total of 140 students completed the study, while 13 refused, a response rate of 91.5 percent. The refusal was due to embarrassment. Data collected on those who refused to participate revealed no differences from the socio-economic or personal aspects.

Results

No difference in age was observed between students with PMS (18.7 ± - 0.9), and those without (18.8 ± - 1.1). Table (1) shows the distribution of PMS in relation to some personal characteristics. The disease distribution is significantly different according to father job class. It tends to be more frequent at higher classes. However, it is not significantly related to residence.

The most frequent symptoms reported by the PMS sufferers were abdominal pain, colic, backache, and general fatigue (74%), irritability and aggressiveness (64%), lack of concentration and isolation (50%). The least reported ones were tingling, numbness, bursts of energy and activity, tinnitus, and skin problems (12%). Table (2) shows the frequency distribution of the severity, attitudes, and beliefs of the students suffering from PMS.

The results of the tests evaluating cognitive functions are displayed in table (3). Paired t-test was used to evaluate the significance of pre-post changes in tests scores in the two groups, with and without PMS. The changes were statistically significant for all the six tests in the case of PMS positive group, while it was so only for the test of word recognition in the other group.

Moreover, comparison of the means of the pre-post score differences of the two groups has shown statistically significant differences for all the tests.

A stepwise regression analysis of the post-test scores as dependent factor, and the pre-test scores, PMS score, and other personal characteristics as independent factors, was done. Only pre-test scores and PMS scores persisted in the models. The r-squared values ranged from 0.4 for the Digit Forward test, to 0.86 for the Omission test. (Cancellation Test). The model and ANOVA of this latter is shown in table (4).

Table 1

Frequency Distribution of PMS with Residence and Father Job Class

	PMS (+ve)		PMS (-ve)		Chi -Sqare
	N	%	N	%	(p value)
Father Job					
* professional	31	31.6	6	14.3	
* semi-prof.	30	30.7	3	7.1	
* skilled	15	15.3	15	35.7	27.9954
*semi-skilled	13	13.2	17	40.5	df=4
* unskilled	9	9.2	1	2.4	p < 0.001
Residence					2.4608
* home	52	52.2	29	69.1	df=1
* student hostel	46	47.8	47.8	30.9	p>0.05

Table 2

Frequency Distribution of PMS Severity and Some Beliefs and Attitudes Towards it.

	No.	%
PMS Severity		
* mild	60	61.2
* moderate	31	31.6
* severe	7	7.2
PMS Perceived Severity		
* mild	64	13.3
* moderate	21	21.4
* incapacitating	13	65.3
PMS is a Problem		
* yes	19	19.4
* no	79	80.6
PMS Should Be Treated		
* yes	19	19.4
* no	79	80.6
Usually Taking Treatment		
* yes	14	14.3
* no	84	85.7

Table 3
Comparison of Pre-and Post-Menstrual Scores of the Various Tests of Abilities in the PMS + ve and PMS - ve Subjects.

	Pre - Test	Post - Test	Paired t
	Mean ± - SD	Mean ± - SD	P value
Digit Forward			
* PMS + ve	6.7 ± - 0.9	7.4 ± - 1.0	< 0.05
* PMS - ve	6.5 ± - 1.1	6.7 ± - 1.3	> 0.05
Mental Control			
* PMS + ve	40.7 ± - 18.1	35.1 ± - 16.9	< 0.05
* PMS - ve	38.5 ± - 26.5	37.1 ± - 25.4	> 0.05
Word Recognition			
* PMS + ve	18.3 ± - 6.2	15.1 ± - 5.5	< 0.05
* PMS - ve	17.5 ± - 7.9	16.5 ± - 7.8	< 0.05
Digit Symbols			
* PMS + ve	190.3 ± - 58.6	166.3 ± - 47.9	< 0.01
* PMS - ve	190.1 ± - 51.9	184.6 ± - 53.2	> 0.05
Omission (Cancellation) (1)			
* PMS + ve	146.0 ± - 45.9	127.5 ± - 44.2	< 0.05
* PMS - ve	156.4 ± - 46.1	151.7 ± - 48.3	> 0.05
Omission (3)			
* PMS + ve	132.6 ± - 71.5	124.6 ± - 57.9	< 0.05
* PMS - ve	178.1 ± - 76.4	170.2 ± - 76.8	> 0.05

Table 4
Model Fitting Results for Post-Menstrual Omission Test (O.T.)

Independent variable	coefficient	std. error	t-value	P-value
Constant	11.411876	6.860552	1.6634	0.0991
O.T. (pre-mens.)	0.919009	0.038314	23.9864	0.0000
PMS	- 0.13968	0.030598	-4.5650	0.0000

R-SQ. (ADJ.) =0.8414 SE= 20.246688 MAE= 13.283730 114 observations fitted.

Table 5
Analysis of Variance for the Full Regression

Source	Sum of Squares	DF	Mean Square	F-Ratio	p-value
Model	246634.	2	123317.	300.825	.0000
Error	45502.0	111	409.928		
Total (Corr.)	292136.	113			

R-squared = 0.844243 Stnd. error of test. =20.2467
R-squared (Adj. For d.f.) = 0.841437

Discussion

Efforts to compare epidemiological data on PMS are likely to be misleading because of the variable interpretation of clinical manifestations, and the obvious difficulties encountered in quantitating the severity of symptoms. This explains the wide variability of the reported prevalence rates of this rather common ailment. On the one hand, Fridman (1989) claimed that the syndrome was present in 97% of healthy women. Similarly, Sharma (1985) found that as many as 70-90% of the female population admitted having recurrent premenstrual symptoms, although only 20-40% reported some degree of temporary psychological or physical incapacitation. On the other hand, Magos & Studd (1984) reported a wide range of 20-90 percent. The results of this study are towards the upper limit of this range. It is interesting to notice that PMS severity as measured by the questionnaire showed that 7.2% of the females studied exhibited severe PMS, however when asked to reported how incapacitating their symptoms were, 65.3% have reported that their symptoms are incapacitating, 80.6% reported that their symptoms were not problematic and should not be treated. These results are in concordant with those of Amin et al, (1989) and El-Defrawi et al, (1990).

PMS was claimed to be positively related to social class. Ewan (1982) noted that there was a higher social class attendance for PMS in hospitals. In our study, father job was used as a surrogate for social class, and PMS are certainly related to the culture and social context. In fact, the complaint of PMS might depend more on the basic personality, culture and circumstances in which the female experiences the cyclical changes, than on the underlying mechanisms (Sanders 1983).

Although this study was undertaken

on medical students, yet only a few of the affected subjects (20%) thought that the disorder should be treated, and even fewer ones actually have sought medical advice. These figures are lower than those reported by Halberich (1982), and Norris (1983) in non-medical female populations. This discrepancy again reflects cross-cultural differences.

Most of the reported symptoms in this study were psycho-social or psychosomatic, with a few somatic complaints. These were studied previously in many instances. However, the effect of the PMS disorder on the performance in mental and cognitive domains was scarcely investigated. In 1968, Golub et al, have shown that one of every three girls had a fall in weekly marks during the pre-menstnal phase followed by a rise after menstruation. However, the study did not differentiate between those with and those without PMS. Also, the scholastic achievement is confounded by many other factors. This is why in our study, cognitive abilities were tested separately to avoid the effect of confounders, and also to prevent successful performance of one ability from obscuring failure to achieve another one. Thus, the findings of this study reflect a true effect of PMS on the tested abilities, namely memory, concentration, and attention. The implications of these effects on scholastic performance are clear. Moreover, they can be extended to influences on productivity, accidents and injuries, and social life.

To conclude, PMS is a common problem, with varying degrees of severity. It affects negatively attention, memory, and concentration abilities. Further studies are needed to investigate the effect of treatment on the correction of these effects on cognitive functions. Meanwhile, tasks that depend greatly on these abilities might be avoided during symptoms.

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Prédominance du Syndrome Prémenstruel Prmi les Étudiantes de Medecine

Le syndrome prémenstruel (SPM) a été supposé d'être un des plus commun problèmes de santé. Il touche un secteur important de population, specialement ceux à l'âge d'éducation, de production et de reproduction.

Le but de ce travail est d'étudier l'effet du syndrome prémenstruel sur quelques fonctions cognitives chez les étudiantes médicales. Un échantillon compréhensif d'étudiantes de la faculté de médecine Université du Can de Suez a été divisé en (SPM + ve) et (SPM - ve) utilisant le questionnaire de détresse menstruel (DMS). L'attention, La concentration et les fonctions de la mémoire ont été évalués en utilisant les tests dérivés de la série de Wechsler pour L'intelligence des Adultes.

Les tests ont été appliqués pré - et post - menstruelment, et les résultats sont trouvés dans le groupe des SPM + ve tandis que ce n'était pas vrai pour le test de la "reconnaissance des mots" chez le groupe des SPM - ve.

L'analyse de la regréssion des scores postmenstruels comme facteur dépendant; des scores du SPM, des resultats des tests prémenstruels et quelques caractéristiques personnels et socio-économiques comme facteur indépendant, ont montré que seulement le SPM et les scores pré-menstruels ont des statistiques significatifs.

Finalement, on conseille de donner plus d'attention á la prévention et au traitement de ce syndrome. Il doit aussi être considéré dans quelques missions et travaux.

معدل إنتشار متلازمة "ما قبل الطمث" لدى طالبات الطب: وأثر ها على الوظائف المعرفية

تعتبر متلازمة ما قبل الطمث من المشاكل الصحية المتكررة التى تؤثر فى الأداء والتأقلم النفسى والعصبى لعدد كبير من الإناث، وتهدف هذه الدراسة إلى معرفة تأثير زملة ما قبل الطمث على بعض المهارات المعرفية فى إناث من كلية الطب. وقد أجريت هذه الدراسة على عينة شاملة من طالبات كلية طب جامعة قناة السويس، بحيث تم تقسيمهم إلى مجموعتين حسب وجود أعراض زملة ما قبل الطمث باستخدام استبيان كرب الطمث، وقد خضعت الإناث الايجابيات لزملة ما قبل الطمث لتقويم مهاراتهم المعرفية فى مجال الذاكرة والتركيز والانتباه عن طريق تطبيق بنود فرعية من إختبار "وكسلر لذكاء البالغين الراشدين" بالإضافة إلى إختبار الشطب وتمييز الكلمات.

وقد طبقت الاختبارات قبل وبعد ظهور الطمث فى العينة الايجابية، لوجود الزملة وقد أظهرت النتائج تأثر واختلال الوظائف المعرفية والمقدمة فى الإناث الإيجابيات لزملة ما قبل الطمث بالمقارنة بالعينة السلبية بهذه الزملة، وقد ناقشت الدراسة النتائج فى ضوء تأثر القدرات المعرفية وأثرها على الإنجاز والاستيعاب.