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The Effect of Anaemia on PMS Patients

Dipan Baidya[1*], Momtaz Begum[2], Shahin Akter[3]

[1*]Lecturer, [2]Professor & Head, [3]Assistant Professor,
Department of Physiology, Chittagong Medical College, Chittagong, Bangladesh.

ABSTRACT

Objectives: In this study our main aim is to evaluate the effect of anaemia on PMS patients.

Methods: This cross-sectional observational study was done in the department of Physiology, Chittagong Medical College, over one-year period from July, 2015 to June, 2016. Total 90 subjects between 18-22 years were selected by purposive sampling according to inclusion and exclusion criteria from the 1st year female medical students. They were divided in anaemic (Group A) and non anaemic (Group B) on the basis of haemoglobin concentration.

Result: Mean (±SD) haemoglobin of the subjects were 11.70 ± 0.26 gm/dl and 14.26 ± 1.31 gm/dl in anaemic and non anaemic group respectively. Mean (±SD) PMS score of the subjects was 7.59 ± 3.6 and 7.08 ± 2.9 in anaemic and non anaemic group respectively. Anaemic subjects showed more PMS score than non anaemic subjects though it was insignificant. On Pearson's correlation, PMS score showed very weak positive correlation with haemoglobin and no correlation with BMI.

Conclusion: From our study we can conclude that, the anaemic subjects had higher PMS scores than non anaemic subjects. There was a weak positive correlation between anaemia and PMS. Further study is needed for better outcome.

Keywords: Anaemia, PMS, Haemoglobin.

INTRODUCTION

Premenstrual syndrome (PMS) is a very common problem in females of different age group. Approximately 5% of women experience severe PMS throughout their lives.[1] Symptoms in PMS occur in a cyclic and recurrent manner in absence of any organic or psychiatric diseases.[1,2] These usually occur in the luteal phase of each menstrual cycle and regress with the onset of menstruation.[1] Medical students are a high-risk group due to their lifestyle.[3]

These symptoms start usually from the teen years and worsen with aging.[4,5] PMS can complicate the process of puberty. Social and educational performance is also affected. It results in poor self-esteem and dissatisfaction which affect daily life of the patients.

Some factors like hormonal change, diet and lifestyle may also cause PMS. It is more prevalent in obese, sedentary and women of low academic background. Using hormonal contraceptives showed a lower incidence of PMS.[1]

The etiology of PMS is still not clear. The pathophysiology of PMS may be related to changes in neurosteroid levels impacting neuronal excitability. Most evidence suggested that PMS results from alteration or interactions between the level of sex hormones and neurotransmitters. A previous study showed ovarian steroid hormones (progesterone) has a regulatory effect on α subunit containing $GABA_A$ receptors. This regulation is broken down in PMS.[5, 6]

Anaemia is pale coloration of skin sclera and mucus membrane due to quantitative or qualitative deficiency of hemoglobin in respect of age and sex. Symptoms of anaemia may include fatigue, weakness, shortness of breath, palpitation etc.

In this study our main goal is to evaluate effect of anaemia on PMS patients.

OBJECTIVE
General Objective
- To evaluate effect of anaemia on PMS patients.

Specific Objectives
- To detect Frequency of physical symptoms in anaemic group.
- To identify correlation between PMS score and Haemoglobin among patients.

METHODOLOGY

Study Type
It was a cross sectional observational study.

Place and Period of the Study
This study was carried out in the Department of Physiology, Chittagong Medical College from
one year (July, 2015 to June, 2016)

Sample Size
To determine the sample size for this study following formula has been used[6,7]:

$$n = \frac{z^2 pq}{e^2} = \frac{(1.96)^2 (0.33)(0.77)}{(0.05)^2} = 339.75$$

Where, n = desired sample size,

z = Standard normal deviate set at 1.96 with 95% confidence interval

p= 33% = 0.33 Estimated prevalence value for the target population according to DSM IV[13].

q = 1-p and = 1-0.33 = 0.77

e = degree of accuracy, 5% of p or acceptable error 0.05%

The optimum sample size was 339.75 at e = 0.05

Due to resource and time constrain 90 subjects were taken in this study.

Inclusion Criteria
- Subjects with symptoms of PMS (Physical and Emotional)
- Age range in between 18-22yrs

Exclusion Criteria
- Subject above 22 years and below 18 years.
- Subjects with systemic diseases like, Diabetes, Thyroid disorders, Migraine, Obesity
- Polycystic ovarian syndrome
- Patient with any known congenital anomalies and psychiatric problem.
- Patient with any known endocrinopathies.
- Subjects on any haematinics like Iron, Vitamin B-complex, Vitamin C, Herbal drugs etc.
- History of intake of drugs like Narcotics, oral contraceptive pills, steroids, anti psychotics
- History of any substance abuse or eating disorders.

Study Population
Total sample size 90. Subjects were divided into two groups: Group A and Group B.

Group A (Anaemic group): Included 41 subjects having PMS symptoms with anaemia

Group B (Non anaemic group): Included 49 subjects having PMS symptoms without anaemia

Sample Method
All subjects were selected purposively on the basis of emotional and physical symptoms mimicking PMS for at least 3 consecutive months during time period 8.00am - 2.30pm daily during class hours.

Method
1st year female medical students of Chittagong Medical College, Chittagong were included in this study. The study was done in the class periods with the kind permission of the Head of the Department. All data were collected in presence of a female class teacher. After completion of daily topic, female students were separated in the same class and study procedures were carried out. Standard international guidelines were followed for the inclusion and exclusion of the subjects. The exclusion criteria were carried out by verbal history taking, physical examination and required investigations. After a clear demonstration about PMS, a verbal discussion was carried out with each student. The students having any common emotional symptoms of PMS like: anxiety, irritability, depression, confusion and mood swings; and any common physical symptom of PMS like: fluid retention, headache, mastalgia, abdominal bloating and joint pain, participated in this study willingly.[1,4-7] 8-10 subjects were examined daily. Though 100 students were selected as subjects but 10 were excluded and 90 remained at the end of the study.

Data Analysis
Data were processed and analyzed using computer based software SPSS (Statistical Package for Social Sciences) for windows version 22.Unpaired t-test was used to compare quantitative variables. Pearson's correlation was done to see the relationship between anaemia and PMS, BMI and PMS. Variables were expressed as range and mean ± SD. p value < 0.05 were taken significant.
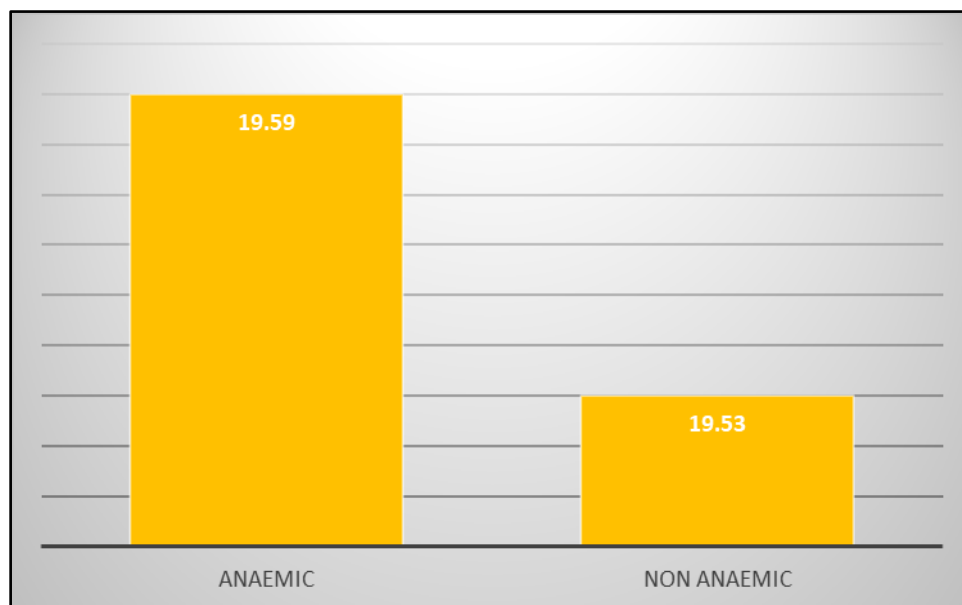

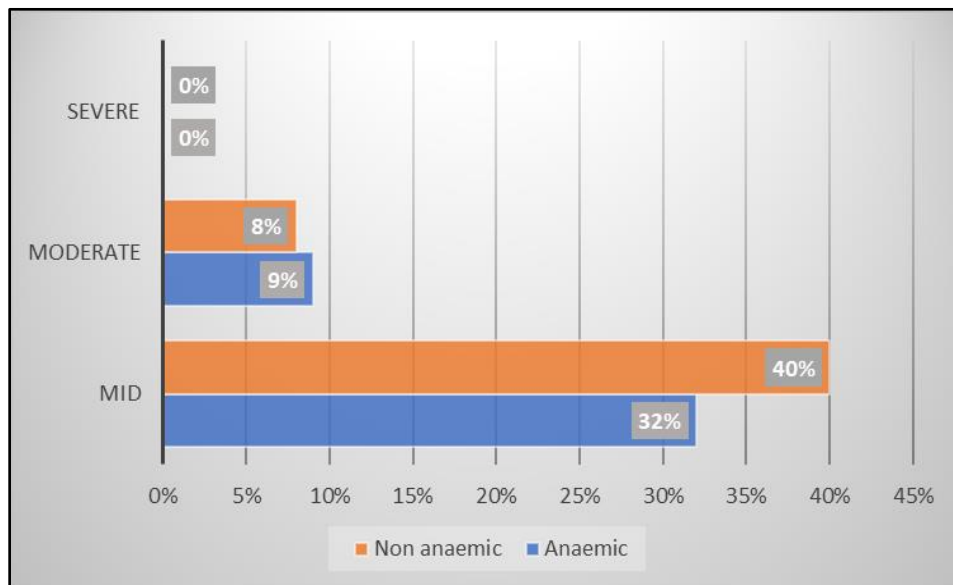**Figure 1: Age distribution of the patients.**
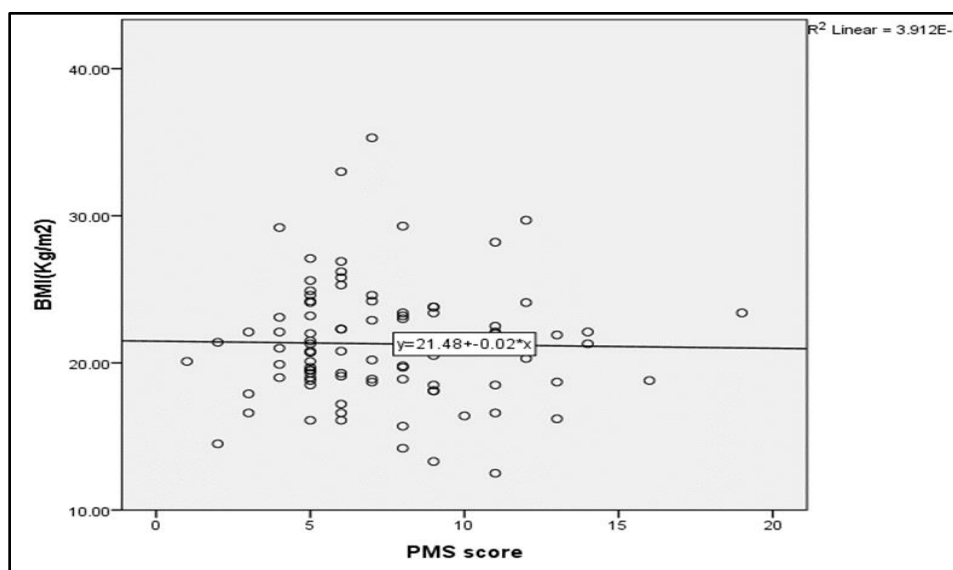
Figure 2: PMS grading of the study subjects.

Figure 3: Correlation between PMS score and BMI among the study subjects

Table 1: Haemoglobin (Hb), RBS, TSH of study groups (n=90)

Variable	Group A	Group B	p value
Hb (gm/dl)	11.70 ± 0.26 (10.8 – 16.7)	14.26 ± 1.31 (10.8 – 16.7)	0.00*** (<0.05)
RBS (mmol/L)	101.04 ± 12.10 (71 - 125)	101.36 ± 10.09 (71 - 125)	0.89 (>0.05)
TSH (mIU/L)	0.98 ± 0.52 (0.42-2.74)	0.90 ± 0.38 (0.42-2.74)	0.40 (>0.05)

Table 2: Frequency of physical symptoms in study group A (anaemic) (n=41)

Physical symptoms of PMS	Group A (n=41)			
	No Symptoms No. (%)	Mild Symptoms No. (%)	Moderate Symptoms No. (%)	Severe Symptoms No. (%)
Fluid retention	41 (41.0%)	0 (0%)	0 (0%)	0 (0%)
Headache	21 (51.2%)	14 (34.1%)	4 (9.7%)	2 (4.8%)
Mastalgia	32 (78.0%)	8 (19.5%)	1 (2.4%)	0 (0%)
Abdominal bloating	22 (53.6%)	13 (31.7%)	6 1(4.6%)	0 (0%)
Joint pain	19 (46.3%)	10 (24.3%)	11 (26.8%)	1 (2.4%)

Group A: Anaemic subjects; n = number of subjects.

Table 3: Correlation between PMS score and Haemoglobin (Hb) among the study subjects.

Variables	Haemoglobin (Hb)	
	r value	P value
PMS score	0.45	0.67

RESULTS

In figure-1 shows age distribution of the patients where mean (±SD) age of the subjects were 19.59 ± 0.7 years and 19.53 ± 0.7 years in group A and group B respectively. No statistically significant differences were observed between two groups and both the groups were matched for age.

In table-1 shows random blood glucose, TSH levels and Haemoglobin levels of the study subjects where mean (±SD) Haemoglobin of the subjects were 11.70 ± 0.26 gm/dl and 14.26 ± 1.31 gm/dl in group A and group B respectively. Mean Hb was significantly lower (< 0.005) in group A than group B. Mean (±SD) RBS of the subjects were 101.04 ± 12.10 mg/dl and 101.36 ± 10.09 mg/dl in group A and group B respectively. No statistically significant differences were observed.

In table-2 shows frequency of physical symptoms in study group A (anaemic) (n=41) where grading was done on the basis of number by adding all the PMS marks in the supplied questionnaire filled up by the subjects (0 = no symptoms, 1 = mild symptoms, 2 = moderate symptoms, 3 = severe symptoms).

In figure-2 shows PMS grading of the study subjects where Number of subjects according to PMS grading in group A and group B. In group A, 32 subjects (78%) had mild and 9 subjects (21%) had moderate symptoms while in group B, 41 subjects (83%) had mild and 8 subjects (16%) had moderate symptoms. None was found having severe PMS score in both groups. Anaemic subjects (Group A) suffered more from moderate PMS symptoms whereas non anaemic subjects (Group B) suffered more from mild PMS symptoms.

In table-3 shows Correlation between PMS score and Haemoglobin among the study subjects where on correlation analysis PMS score showed very weak positive correlation with haemoglobin.

In figure-3 shows correlation between PMS score and BMI among the study subjects where on correlation analysis PMS score showed negative correlation with BMI.

DISCUSSION

Premenstrual syndrome is a cyclic recurrence of distressing emotional and physical symptoms in the luteal phase of menstrual cycle and these must be resolved by ovulation.[1,4,6] Symptoms must present in at least 3 of last 6 cycles. Nearly all women with regular menstrual cycles experience some symptoms in the luteal phase of the cycle. If these symptoms are exaggerated then called PMS.[4,6] There is still controversy regarding haemoglobin concentration in different phases of menstrual cycle.[6,7] Recent studies showed that anaemia is significantly related to depression, fatigue and postpartum depression (PPD)[7].Variation of haemoglobin concentration, alteration of peripheral circulation during luteal phase were supposed to be responsible for various PMS symptoms.[10,11] In our study, 41 subjects were anaemic having haemoglobin <12 gm/dl and 49 subjects were non anaemic having haemoglobin >12 gm/dl[8]. They were grouped as anaemic group (Group A) and non anaemic group (Group B).

Age group selected in our study was 18 years to 22 years as in previous studies.[3,4] PMS symptoms were commonly observed in this age group.[10-12] Girls in this age feel shameful and reluctant to report about menstrual abnormalities.[18]

Severity of PMS were calculated by scoring them in our study. Mean PMS score was higher in anaemic group than non anaemic group in our study. It was similar to previous studies[4]. Higher PMS score was found in anaemic subjects in those studies and it was due to anaemia as suggested by them[4,2].

In our study 78% of anaemic subjects showed mild and 21% showed moderate PMS symptoms. On the other hand, 83% of non anaemic subjects had mild and 16% had moderate PMS symptoms. We did not get any severe PMS subject in either groups. Severity of symptoms was more in anaemic subjects though it was insignificant (p>0.05). Our findings dissimilar with other studies.[4] Aetiology of PMS is multifactorial and complicated.[4,13] Anaemia reduces oxygen supply to the body that might cause PMS symptoms[3]. Measurement of venous oxygen index (VOI) in peripheral circulation showed altered peripheral circulation in luteal phase which was supposed to be related to PMS symptoms.[2]

Recent studies showed that transporters for serotonin and norepinephrine are decreased in iron deficiency anaemia causing PMS.[4,5] Altered noradrenergic and/or thyroid function might cause the capillaries smaller in PMS subjects as suggested in a study.[2]

CONCLUSION

From our study we can conclude that, the anaemic subjects had higher PMS scores than non anaemic subjects. There was a weak positive correlation between anaemia and PMS. Further study is needed for better outcome.

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