Women’s Behavioral Health in Relation to Premenstrual Syndrome

Rabail Javed, Rukhama Haq, Dania Mubashir, Fatima Nadeem, Nadeem Ahmad and Shugufa Naz

Abstract—Premenstrual syndrome (PMS) is a frequent illness that involves physical and traumatic symptoms. The study is conducted among the females of Pakistan to find out the factors which are associated with Premenstrual syndrome. The targeted population including married and unmarried females filled out a detailed questionnaire based on the symptoms that occur during PMS, their interpersonal relations and their dietary habits. The cortisol levels were calculated and its association was found with PMS. The most common symptoms were found to be fatigue, cramping, mood swings and depression. Fatigue was found to be 40% in married and 52% in unmarried females. The severity of depression was common in both married (20%) and unmarried (22%) females. The calorie intake and BMI was either too less or too high in the females having premenstrual syndrome.

Index Terms—BMI, Cortisol, Depression, Premenstrual Syndrome, Premenstrual Dysphoric Disorder.

I. INTRODUCTION

Premenstrual syndrome (PMS) is described as a cyclic disorder in which symptoms appear before the menstruation initiation and diminish after the onset of menstruation [1]. PMS illustrate the physical, cognitive, affective, and behavioral side effects that cyclically arise during the luteal phase of the menstrual cycle. The symptoms of PMS are mostly experienced by up to 90% of females of child bearing age [2]. Symptoms broadly related with PMS include physical indications such as bloating, breast tenderness, edema, headache, weight gain, nausea and sweating, anxiety, irritability and aggression [3]. All over the globe several biosocial and psychological reasons have been associated with this syndrome, including irregular serotonin levels, disrupted endorphin balance, and lifestyle changes [2]. PMS initiates pessimistic approach effecting social life, education, jobs, bringing low self-esteem with decreased tolerance to stress and provoked sentiments of inefficiency [4].

In developing countries like Pakistan where women rights are still waned the problem of PMS is very high. During a retrospective survey in Pakistan (Peshawar), it was found that about 75% females of reproductive age experience some symptoms allocate to the premenstrual phase of menstrual cycle [5]. These symptoms caused serious barriers in day to day life, marital relations and child mother relations of these women [6]. The present study was designed to determine the prevalence rate of common factors associated with PMS and also to create awareness about PMS and ways that can manage premenstrual syndrome among females.

II. PARTICIPANTS AND METHOD

The ethical approval was taken from Institutional Review Board (IRB) of Sheikh Zayed Medical Complex, Lahore. Informed consent was taken from all participants. A community survey was conducted including 50 married and 50 unmarried females. The sample size was estimated by using 95% confidence level, 10% margin of error with expected frequency of PMS 3-8%.

The unmarried girls were between 14-24 years where as married women were of 25-45 years’ age. Only those females having premenstrual syndrome were included in this study. Those women having PMS due to thyroidal disorders, pregnancy, chronic hormonal dysfunctions and fertility problems were excluded from the study.

The data/sample was collected after distributing Lahore into four clusters in accordance with cardinal points. From each cluster 20 households (10 households each for married and unmarried females’ data and sample collection) were taken after random selection of towns. Twenty house hold from Lahore center were also randomly selected for same.

Each participant was individually interviewed in detail and was asked about their personal life style, history of depression and drug abuse, interpersonal relations with family/friends/colleagues, effects on education and job, dietary habits, social interactions, history of fatigue, anxiety, mood swings and aggression. The clinical history of blood pressure (BP) was taken from each participant. Each participant’s BP was measured by using digital BP apparatus (OMRON, UK). The height and weight of the participants were measured by using weighing and height machine (Jiangsu Suhong, China) and their BMI’s were calculated. The calorie intake was estimated by using food frequency chart.

Each participant was asked to give 3CC blood through venipuncture. The blood cortisol levels are associated with level of depression and serotonin. It is easier to measure due to higher shelf life than serotonin [7]. Blood samples were centrifuged at 3000 rpm for 10 minutes and serum was separated, stored at -20 degree Celsius until analysis. Competitive ELISA technique (Cal-biotech USA) was used

Published on August 31, 2020.
R. Javed, National Health Research Complex, Pakistan.
(e-mail: rabailjaved@hotmail.com)
R. Haq, Lahore College for Women University, Pakistan
(e-mail: rukhama877@gmail.com)
D. Mubashir, Lahore College for Women University, Pakistan
(e-mail: daniaawa@gmail.com)
F. Nadeem, Lahore College for Women University, Pakistan
(e-mail: Fatima.classy@gmail.com)
N. Ahmed, Combined Military Hospital, Pakistan
(e-mail: nadeemahmed2009@gmail.com)
S. Naz, Lahore College for Women University, Pakistan
(e-mail: drsnaz31@yahoo.com)

DOI: http://dx.doi.org/10.24018/ejers.2020.5.8.2092
to measure serum cortisol levels. The quality control pools were placed in the start and end of the assay batch. The sensitivity of the assay was 7.9% with 97% specificity. The data was entered and analyzed into SPSS (Version 21.0). Frequencies, associations and variations were analyzed by applying chi-square and t-test. P < 0.005 was considered statistically significant.

III. RESULTS

In the current study, 100 participants were enrolled, within the duration of 6 months through a community based survey. The participants of this study included 50 unmarried females between the age group of 14-24 years and 50 married women between the age group of 25-45 years. The clinical symptoms were analyzed in this study.

A. Physical Symptoms

The responses of the participants gathered from the questionnaire shows that mostly married females (18 participants) had mild symptoms of headache. Whereas 13 participants had no symptoms and only 10 married female experiences severe headache. In unmarried girls, severe cases of headache were 22%. In this current study 40% of participants responded the severe condition of fatigue during PMS.

Cramping has highest frequency in severe cases (34). Bloating was the next symptom mentioned in the questionnaire the responses of the participants were 15 who experienced severe symptoms of bloating.

B. Physiological Symptoms

In current study, it was observed that various physiological factors were associated with PMS. Mild to moderate symptoms of mood swings were observed in almost 40% of unmarried girls whereas in married females 11 severe cases were reported. Ten severe cases of depression were found in married females and 11 in unmarried girls.

C. Comparison of BMI and Cortisol Level

The BMI of all the participants were calculated on the basis of their weight and height and compared with the results of the cortisol levels. It was recorded in this study that 8% of unmarried girls have normal level of stress hormone but elevated at higher side. Twenty-one overweight married females were reported in which 2 of them had high cortisol levels.

| BMI          | Normal | Normal | High | Total |
|--------------|--------|--------|------|-------|
|              | at lower side | at higher side |     |       |
| Under weight | 0      | 3      | 0    | 1     | 4     |
| Normal       | 1      | 14     | 7    | 0     | 23    |
| Overweight   | 3      | 11     | 2    | 3     | 21    |
| Obese        | 0      | 1      | 0    | 1     | 2     |
|              |        |        |      |       |
| Unmarried    |        |        |      |       |
| Under weight | 0      | 5      | 12   | 2     | 20    |
| Normal       | 3      | 9      | 11   | 2     | 26    |
| Overweight   | 0      | 0      | 0    | 4     | 4     |
| Obese        | 0      | 0      | 0    | 0     | 0     |
|              |        |        |      |       |
| Total        | 7      | 43     | 32   | 8     | 100   |

D. Comparison of Calories and Cortisol Level

The table 2 depicts the comparison of calories consumption and cortisol level of the participants who took part in this study. Total of 3 unmarried participants were observed with high level of stress hormone that were having calories intake between 380-1000 and similar number was observed within the calories intake 1001-2000. The table shows that married females who were consuming 380-1000, only 1 had high cortisol value. The participants (25) with calories consumption of 1001-2000 had 12 normal at lower side cortisol levels and 3 with high cortisol levels.
In current study, caloric intake of PMS patients was also assessed. Low weekly and highly imbalanced daily calorie consumption was seen in PMS study participants. Fifty-six (56%) percent of unmarried females and 50% of married females are having low calorie intake (between 380-1000kcal). Studies conducted in America reported strong relationship between premenstrual syndrome and higher caloric intake that includes rich carbohydrate meal [12]. This difference in calorie consumption might be due to dieting behavior and eating disorders.

Pakistan being a developing country faces many problems. Most females in this country have less knowledge about managing PMS problems and dietary habits.

V. CONCLUSION

Premenstrual syndrome is a multifactorial disorder which affects both married and unmarried females with high frequency. Stress activity rate, imbalance dietary habits and BMI play a major part in the formulation of PMS. Depression is linked with the PMS which affects the quality of life of the females. Females suffering with PMS have fluctuated level of cortisol in them.

ACKNOWLEDGMENT

All the staff of NHRC, Sheikh Zayed Hospital is acknowledged for their support throughout this study.

CONFLICT OF INTEREST

There was no conflict of interest in this study.

REFERENCES

[1] C. Reiber, “An evolutionary model of premenstrual syndrome,” Medical Hypotheses, vol. 70, pp. 1058-1065, Jan. 2008.
[2] M. Balaha, M. Amr, M. Moghannum, and N. Muhaida, “The phenomenology of premenstrual syndrome in female medical students: a cross sectional study,” Pan African Medical Journal, vol. 5, Apr. 2010.
[3] S. Sahn, K. Ordemir, and A. Unsal, “Evaluation of premenstrual syndrome and quality of life in university students,” Journal of Pakistan Medical Association, vol. 64, pp. 915-22, Aug. 2014.
[4] N. K. Chandraratane, and N. S. Gunawardena, “Premenstrual syndrome: the experience from a sample of Sri Lankan adolescents,” Journal of Pediatric and Adolescent Gynecology, vol. 24, pp. 304-310, Oct. 2011.
[5] S. Tabassum, B. Afridi, Z. Aman, W. Tabassum, and R. Durrani, “Premenstrual syndrome: frequency and severity in young college girls,” Anxiety, vol. 55 pp. 546-549, Dec. 2005.
[6] F. Ghodrati, M. Delghani, P. Tavakoli, and M. Akbarzadeh, “Investigation of Self-Esteem in High School Students with Premenstrual Syndrome,” Razavi International Journal of Medicine, Feb. 2018.
[7] A. Heinz, D. Jones, G. Bissette, D. Hommer, P. Ragan, M. Knable, et al., “Relationship between cortisol and serotonin metabolites and transporters in alcoholism,” Pharmacopsychiatry, vol. 35, pp. 127-134, July 2002.
[8] O. Derman, N. Ö. Kanbur, T. E. Tokur, and T. Kutuk, “Premenstrual syndrome and associated symptoms in adolescent girls,” European Journal of Obstetrics and Gynecology and Reproductive Biology, vol. 116, pp. 201-206, Oct. 2004.
[9] C. M. Raval, B. N. Panchal, D. S. Tiwari, A. U. Vala, and R. B. Bhatt, “Prevalence of premenstrual syndrome and premenstrual dysphoric disorder among college students of Bhavnagar, Gujarat,” Indian Journal of Psychiatry, vol. 58, pp. 164, April 2016.

IV. DISCUSSION

Premenstrual syndrome is a disorder affecting the lives of millions of women around the globe, many of the females have poor social and marital life due to disturbances and alarming signs of PMS. This current study explored the effect of premenstrual syndrome and all the possible factors which can be related to PMS.

In present study, the major physical symptoms observed are fatigue and cramping. The calculated percentage in married females for fatigue is 40% and in unmarried females is 52%. Whereas 34% females are found to be affected with cramping in both cases. A study conducted elsewhere also showed similar results that these are the most common physical symptoms associated with premenstrual syndrome [8].

In this study it was found that some physiological factors are also associated with premenstrual syndrome. Mood swings and irritability were observed to be more common physiological factors among females suffering with premenstrual syndrome. Present study shows moderate to severe symptoms of irritability among married and unmarried females and percentages are found to be 40% and 52% respectively. The present study was supported by the study elsewhere that 49% of females’ experience irritability during PMS [9].

In this study, depression level is also analyzed to find out how PMS is a significant cause of stress in the life of females. The results of this study revealed the severe cases of PMS in married females which are reported 20% and in unmarried females 22% whereas studies elsewhere elaborated that the severity of depression was found to be 11.3% [10].

In current study, it was clearly observed that BMI had a relation with cortisol levels. High BMI level and weight gain are also important stress causing factors. This study reports, out of 4 overweight unmarried PMS positive patients, all were having stressful life because their cortisol levels were observed high. The married overweight participants either had higher cortisol levels or lower cortisol levels. Thus, their cortisol levels are found to be disturbed. International studies report that, stress and obesity can be correlate with each other especially in PMS patients [11].

| Calories | Normal at lower side | Normal at higher side | High | Total |
|----------|----------------------|-----------------------|------|-------|
| 380-1000 | 1 | 17 | 5 | 1 | 1 | 25 |
| 500-1000 | 3 | 12 | 4 | 3 | 3 | 25 |
| 380-1000 | 2 | 9 | 11 | 3 | 3 | 28 |
| 500-1000 | 1 | 5 | 12 | 1 | 3 | 22 |

TOTAL 7 43 32 8 10 100

IV. DISCUSSION

Premenstrual syndrome is a disorder affecting the lives of millions of women around the globe, many of the females have poor social and marital life due to disturbances and alarming signs of PMS. This current study explored the effect of premenstrual syndrome and all the possible factors which can be related to PMS.

In present study, the major physical symptoms observed are fatigue and cramping. The calculated percentage in married females for fatigue is 40% and in unmarried females is 52%. Whereas 34% females are found to be affected with cramping in both cases. A study conducted elsewhere also showed similar results that these are the most common physical symptoms associated with premenstrual syndrome [8].

In this study it was found that some physiological factors are also associated with premenstrual syndrome. Mood swings and irritability were observed to be more common physiological factors among females suffering with premenstrual syndrome. Present study shows moderate to severe symptoms of irritability among married and unmarried females and percentages are found to be 40% and 52% respectively. The present study was supported by the study elsewhere that 49% of females’ experience irritability during PMS [9].

In this study, depression level is also analyzed to find out how PMS is a significant cause of stress in the life of females. The results of this study revealed the severe cases of PMS in married females which are reported 20% and in unmarried females 22% whereas studies elsewhere elaborated that the severity of depression was found to be 11.3% [10].

In current study, it was clearly observed that BMI had a relation with cortisol levels. High BMI level and weight gain are also important stress causing factors. This study reports, out of 4 overweight unmarried PMS positive patients, all were having stressful life because their cortisol levels were observed high. The married overweight participants either had higher cortisol levels or lower cortisol levels. Thus, their cortisol levels are found to be disturbed. International studies report that, stress and obesity can be correlate with each other especially in PMS patients [11].

In current study, calorie intake of PMS patients was also assessed. Low weekly and highly imbalanced daily calorie consumption was seen in PMS study participants. Fifty-six (56%) percent of unmarried females and 50% of married females are having low calorie intake (between 380-1000kcal). Studies conducted in America reported strong relationship between premenstrual syndrome and higher caloric intake that includes rich carbohydrate meal [12]. This difference in calorie consumption might be due to dieting behavior and eating disorders.

Pakistan being a developing country faces many problems. Most females in this country have less knowledge about managing PMS problems and dietary habits.

V. CONCLUSION

Premenstrual syndrome is a multifactorial disorder which affects both married and unmarried females with high frequency. Stress activity rate, imbalance dietary habits and BMI play a major part in the formulation of PMS. Depression is linked with the PMS which affects the quality of life of the females. Females suffering with PMS have fluctuated level of cortisol in them.

ACKNOWLEDGMENT

All the staff of NHRC, Sheikh Zayed Hospital is acknowledged for their support throughout this study.

CONFLICT OF INTEREST

There was no conflict of interest in this study.

REFERENCES

[1] C. Reiber, “An evolutionary model of premenstrual syndrome,” Medical Hypotheses, vol. 70, pp. 1058-1065, Jan. 2008.
[2] M. Balaha, M. Amr, M. Moghannum, and N. Muhaida, “The phenomenology of premenstrual syndrome in female medical students: a cross sectional study,” Pan African Medical Journal, vol. 5, Apr. 2010.
[3] S. Sahn, K. Ordemir, and A. Unsal, “Evaluation of premenstrual syndrome and quality of life in university students,” Journal of Pakistan Medical Association, vol. 64, pp. 915-22, Aug. 2014.
[4] N. K. Chandraratane, and N. S. Gunawardena, “Premenstrual syndrome: the experience from a sample of Sri Lankan adolescents,” Journal of Pediatric and Adolescent Gynecology, vol. 24, pp. 304-310, Oct. 2011.
[5] S. Tabassum, B. Afridi, Z. Aman, W. Tabassum, and R. Durrani, “Premenstrual syndrome: frequency and severity in young college girls,” Anxiety, vol. 55 pp. 546-549, Dec. 2005.
[6] F. Ghodrati, M. Delghani, P. Tavakoli, and M. Akbarzadeh, “Investigation of Self-Esteem in High School Students with Premenstrual Syndrome,” Razavi International Journal of Medicine, Feb. 2018.
[7] A. Heinz, D. Jones, G. Bissette, D. Hommer, P. Ragan, M. Knable, et al., “Relationship between cortisol and serotonin metabolites and transporters in alcoholism,” Pharmacopsychiatry, vol. 35, pp. 127-134, July 2002.
[8] O. Derman, N. Ö. Kanbur, T. E. Tokur, and T. Kutuk, “Premenstrual syndrome and associated symptoms in adolescent girls,” European Journal of Obstetrics and Gynecology and Reproductive Biology, vol. 116, pp. 201-206, Oct. 2004.
[9] C. M. Raval, B. N. Panchal, D. S. Tiwari, A. U. Vala, and R. B. Bhatt, “Prevalence of premenstrual syndrome and premenstrual dysphoric disorder among college students of Bhavnagar, Gujarat,” Indian Journal of Psychiatry, vol. 58, pp. 164, April 2016.
[10] F. C. Knauss, E. Z. Stutz, C. Weiss, and S. Tschudin, “The interrelation between premenstrual syndrome and major depression: results from a population-based sample,” Bio Medical Central Public Health, vol. 11, pp. 795, Dec. 2011.

[11] J. Wurtman, and R. Wurtman, “The trajectory from mood to obesity,” Current Obesity Reports, vol. 7, pp. 1-5, March 2018.

[12] J. J. Wurtman, A. Brzezinski, R. J. Wurtman, and B. Laferrere, “Effect of nutrient intake on premenstrual depression,” American Journal of Obstetrics and Gynecology, vol. 161, pp. 1228-1234, Nov. 1989.

Rabail Javed born in Bahawalpur city of Punjab Pakistan in 1980 and qualified B.Sc in Biological Sciences in year 2000 from Islamia University Bahawalpur. Masters in Biochemistry in 2003 was done from University of the Punjab, Lahore Pakistan and Mphil Biotechnology in 2014 from Forman Christian College a Chartered University, Lahore. The PhD in biotechnology was further started from Lahore College for Women University in 2016. Since 2007 she has been working as a research scientist in Pakistan Health Research Complex and has earned a great experience in public health sector as well as clinical studies. Her utmost research interests are in hormones, steroids, nutrition and vitamins studies up to gene level. She has a thirteen-year experience in running international and national funded projects. Mrs. Javed has thirteen publications which are published in indexed and impact factor journals. She was awarded best poster award in 16th annual Amsterdam conference. She has worked in University College London on Policy Drafting and have attained great deal of experience in Qualitative and Quantitative Research. Her trainings includes EMRO training program which she attended in Cairo Egypt in 2007. E-mail: rabailjaved@hotmail.com