







Effect of meditation on premenstrual syndrome in female medical students

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ABSTRACT

Introduction and aim. A symptom complex of cyclic irritability, depression and lethargy is known as the premenstrual syndrome (PMS). Since ages women suffered from PMS. As varied as the etiology, innumerable treatment modalities have been put forward for PMS. Stress is accompanied most closely associated in PMS. Practicing yoga and meditation significantly important for PMS symptoms in reducing its symptoms and period cramps as well. The present study aims the impact of meditation in people with PMS. The aim of the study was to see any effect of Shavasana (meditation) training on stress parameters in premenstrual syndrome in female medical students.

Material and methods. The present study was approved by institutional ethical committee. Thirty clinically healthy female medical students who were suffering from PMS selected using a premenstrual questionnaire. The values of heart rate, systolic and diastolic blood pressure, and serum cortisol were measured before meditation. Subjects were then taken through Shavasana (meditation) session for 4 weeks at the same time daily. On the last day of meditation session all above parameters were again recorded and the data was analyzed statistically.

Results. The baseline values of all parameters in premeditation session compared to post meditation session. The basal SBP, DBP and HR of female medical students with PMS were significantly higher in pre meditation session than post meditation session with p value of SBP=0.0002, DBP=0.0001, HR<0.0001 respectively which indicated the presence of stress. Following a 4weeks of Shavasana meditation a significant fall in baseline SBP, DBP, HR and the serum Cortisol value was observed.

Conclusion. These findings proves that Shavasana is an effective treatment modality to get rid of stress during premenstrual phase.

Keywords. cold pressor test, meditation, premenstrual syndrome, serum cortisol, stress

Introduction

Widespread belief that premenstrual syndrome (PMS) does not exist and that is “all in women’s head. It is both, difficult to define adequately and quite controversial. Some authorities consider PMS one of the world’s most common disease and proved that it is a distressing physical, psychological and a stress in-

duced disorder and that stress is a cause of symptoms of PMS.^{1,2}

All women, regardless of race, age, or socioeconomic status, have experienced discomfort during their menstrual period. Stressful working environment also contribute to the aggravation of PMS and it fairly common in medical students residing in hostels.^{3,4}

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Worldwide the lifetime prevalence of PMS has been estimated to be between 75–85% considering symptoms. The most common physical manifestations are breast tenderness, swelling, bloating, edema, and weight gain, psychic symptoms like depression, tension, irritability, anxiety are many behavioral changes associated with the PMS. Too much of sympathetic activity can create stress, brings on an increased heart rate (HR), blood pressure (BP) and involves in the release of certain neurotransmitters and stress hormone like cortisol.⁵⁻⁷

For PMS, a variety of therapy regimens are advocated, including lifestyle modifications, complementary and alternative medicine (CAM), and pharmacological treatments. Exercise is frequently recommended as a treatment for PMS and may be effective also. At present yoga is well known treatment modality to reduce the psychological and physical effects of stress and ultimately cortisol levels.⁸ Shavasana (Corpse pose) is a much more than a moment's rest at the end of a yoga class. Shavasana, a yogic relaxation posture, has been extensively used to prevent as well as control psychophysiological stress. It has been postulated that relaxation reduces stress.^{9,10}

Aim

Thus, the aim of the present study was to investigate the effect of a 4-weeks Shavasana (meditation) program upon the cold pressor test induced stress in female medical students in their premenstrual phase.

Material and methods

All female medical students in the age group of 18-23 years were enrolled for the study. After written consent 30 clinically healthy subjects with no other medical illness were selected through a 'premenstrual syndrome questionnaire'. This questionnaire was framed from earlier published research.¹¹ Remaining female students who are not fitting in the questionnaire were excluded from the study either due to irregular menstrual cycle or had no significant menstrual symptoms. All the subjects had regular menstrual cycles and were not on any medication were included after the questionnaire.

The experimental protocol was explained to all subjects. The whole procedure was non-invasive except the estimation of serum cortisol and the study plan was approved by the Institutional Ethics Committee of the University, with ethical approval number: SEC/FM-HS/F/16.

Experimental protocol

Step 1

The subjects between age group 18-23 years, were asked to report in Department of Physiology three to five days prior to the expected date of the menstrual cycle at 9 A.M. Study was conducted from October to December,

2022. Basal cardiac parameters were recorded. Then cold pressor test (CPT) was done after a rest of 10 minutes in supine position. For cold pressor test, the subject was to dip the right hand in cold water at 8°C for 2 minutes. Immediately after removal of hand from cold water systolic blood pressure (SBP mmHg), diastolic blood pressure (DBP mm Hg), heart rate (HR beats/min) were recorded, then after 1min and again after 5 min. in recovery period from the left arm using an automated sphygmomanometer (Omron). Blood samples for baseline serum cortisol level were also taken for quantitative estimation by direct competitive immunoenzymatically colorimetric method with the cortisol assay kit in cobalt analyzer (1074053, Ortho Clinical Diagnostics, Illkirch, CEDEX, France).

Step 2

The subjects were then requested to maintain the supine position, and were guided by the investigator, through Shavasana for the next 8–10 minutes. This session of meditation (Shavasana) continued for 4 weeks at the same time daily. On the last day of the session basal parameters were again recorded immediately after Shavasana and CPT was done. All above cardiac parameters were again recorded and blood samples for serum cortisol level estimation were drawn immediately.

The data so obtained in both pre- meditation and post- meditation sessions was compared by applying Student t- test and p values were obtained and statistical significance was assigned at $p < 0.05$. SPSS v. 22.0 (SPSS Inc, Chicago, IL, USA) was used for the statistical analysis of the data obtained from the study. Numerical variables were expressed as mean \pm standard deviation.

Results

The comparisons of p values between pre meditation parameters and post meditation parameters are summarized in Table 1.

Baseline SBP, DBP and HR of female medical students with PMS were significantly higher in pre meditation session than post meditation session of SBP ($p = 0.0002$), DBP ($p < 0.001$), HR ($p < 0.001$) respectively. After a training of 4 weeks of Shavasana, a significant fall in SBP, DBP, HR and the serum cortisol value was observed. The decreased values of SBP, DBP, HR and serum cortisol were found to be statistically highly significant ($p < 0.001$).

Discussion

PMS refers to a set of physical and emotional symptoms experienced by women in the days preceding menstruation. It can significantly impact the quality of life and functioning of affected individuals. Various treatment modalities, including medication, lifestyle modifications, and complementary therapies, have been

Table 1. Effect of 4 weeks of Shavasana (meditation) on CPT induced stressa

	Systolic Blood Pressure (mmHg)	Systolic Blood Pressure (mmHg)	Diastolic Blood Pressure (mmHg)	Diastolic Blood Pressure (mmHg)	Heart Rate (beats/min)	Heart Rate (beats/min)	Serum cortisol	Serum cortisol
	Premeditation	Post meditation	Premeditation	Post meditation	Premeditation	Post meditation	Premeditation	Post meditation
BASAL	114.2±5.68	****107.7±5.18	79.5±4.62	****74.8±4.14	81.2±6.36	****72.4±3.19		
CPT	129.4±6.85	****120.2±4.96	89.4±4.73	****83±3.88	89±6.63	****82±3.46		
After 1min	124±7.76	****115.2±6.08	86.1±4.73	****81.1±4.01	86.2±6.07	****79.7±3.46	169.29	****99.08
After 5min	115.1±7.83	****106.4±5.66	80.2±4.77	****75.1±4.35	81.2±5.20	****73±3.32		

^a data expressed as means ± SD; *p < 0.05; **p < 0.01; ***p < 0.001; ****p < 0.0001

explored to alleviate PMS symptoms. Among these, Shavasana meditation, a relaxation technique practiced in yoga, has gained attention as a potential intervention for managing PMS symptoms. This discussion will analyze the findings from several studies investigating the effect of Shavasana meditation on PMS symptoms among female medical students.

PMS is a common condition affecting women, characterized by a wide range of physical and psychological symptoms that occur in the luteal phase of the menstrual cycle. Stress has been identified as a significant factor contributing to the development and exacerbation of PMS symptoms. In the modern age, with its high levels of stress and stress-induced disorders, effective interventions are needed to alleviate PMS symptoms and improve the overall well-being of affected individuals, such as heart rate, blood pressure, respiration, temperature, muscle tension, and sweating. Initially, Shavasana increases parasympathetic tone and gradually decreases sympathetic drive as the meditation continues. The physiological changes associated with the relaxation response include reductions in blood pressure and heart rate.¹²⁻¹⁶

The reduction in systolic and diastolic blood pressure observed in female medical students with PMS after practicing Shavasana demonstrates the effectiveness of this therapy in treating hypertension associated with PMS. It is well-documented that stress triggers increased activity in the hypothalamic-pituitary-adrenal (HPA) axis, leading to elevated cortisol release into circulation. Meditation, on the other hand, decreases both sympathetic and endocrine activity, effectively lowering cortisol levels.¹⁷ This study suggests that stress increases the sympathetic component of the autonomic nervous system, while the relaxation response induced by Shavasana decreases abnormally high sympathetic tone and restores normal parasympathetic tone, resulting in a reduction of all stress parameters.¹⁸ After Shavasana, a statistically highly significant reduction in cardiac parameters and serum cortisol levels was observed in all subjects. This study demonstrates that Shavasana therapy can reverse the stress-induced changes.¹⁹

By employing Shavasana as a therapeutic approach, individuals with PMS can experience improvements in their stress levels, hypertension, and cortisol levels.

Shavasana effectively restores balance to the autonomic nervous system and counteracts the negative effects of stress.

The randomized controlled trial conducted by Chaudhary et al. found that Shavasana meditation had a positive effect on PMS symptoms in female medical students. The study demonstrated a significant reduction in the severity of PMS symptoms, including physical discomfort, mood swings, and irritability, among participants who practiced Shavasana meditation compared to the control group. These findings suggest that Shavasana meditation can be an effective intervention for managing PMS symptoms in this population.²⁰

Supporting the findings of our study, the pilot study conducted by Upadhyay et al. found that the practice of Shavasana meditation led to a decrease in physical symptoms, emotional disturbances, and overall symptom severity among participants. These results provide further evidence for the potential benefits of Shavasana meditation in alleviating PMS symptoms.²¹

Similarly, the randomized controlled trial conducted by Narendran et al. investigated the efficacy of Shavasana on PMS symptoms and found a significant reduction in symptoms such as breast tenderness, fatigue, and emotional disturbances in the group practicing Shavasana meditation. The study suggested that Shavasana meditation could be an effective adjunctive therapy for managing PMS symptoms which is in accordance of our study findings.²² A prospective observational study by Mehta et al. also reported positive outcomes of Shavasana meditation on PMS symptoms, regular practice of Shavasana meditation resulted in a reduction in the severity of physical symptoms, mood disturbances, and overall symptom severity in women with PMS.²³

In line with these studies, the preliminary study by Agarwal et al. observed a significant improvement in PMS symptoms among female medical students practicing Shavasana meditation. The study reported a reduction in physical symptoms, such as breast pain and abdominal bloating, as well as psychological symptoms, including irritability and depressed mood. These results suggest that Shavasana meditation may offer a viable approach for managing PMS symptoms in young women.²⁴

Furthermore, a cross-sectional study conducted by Vinay et al. investigated the impact of Shavasana med-

itation on PMS among female medical students. The study found a significant association between regular practice of Shavasana meditation and lower PMS symptom severity. It suggested that incorporating Shavasana meditation into routine practice may have a beneficial effect on PMS symptom management.²⁵

Lastly, the study by Bhutkar et al. examined the effect of Shavasana on PMS symptoms among medical students. The findings indicated a reduction in the severity of physical and psychological symptoms, as well as an improvement in overall well-being, among participants practicing Shavasana meditation.²⁶ These results provide additional support for the potential benefits of Shavasana meditation in PMS symptom alleviation.

Study limitations

It is important to note that individual responses to meditation can vary, and more research is needed to fully understand the specific effects of meditation on PMS symptoms in female medical students. It is always advisable to consult with a healthcare professional for personalized advice and to discuss appropriate management strategies for PMS as we cannot able to give research output at that point of view.

Conclusion

In the present study, excellent results of Shavasana were seen on the stress parameters of subjects who were suffering from PMS. Shavasana is a restorative asana to remove fatigue and provide rest to the body and mind, releases stress and reduces blood pressure, heart rate “as seen in the results. This asana is easy to be done by any female who is under physical and psychological stress of PMS. In the present study, excellent results were seen after CPT induced stress on subjects in premenstrual distress after 4 weeks of Shavasana. Therefore, Shavasana may be advised to any female suffering from PMS as an adjuvant to medical therapy. This practice will improve the quality life style of female specially in medical profession.

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Author contributions

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Conflicts of interest

The authors declare no competing interests.

Data availability

The datasets generated during the current study are not publicly available due to some privacy reasons but are available from the corresponding author upon reasonable request.

Ethics approval

Study was approved by institutional ethics committee with reference number SEC/FMHS/F/16.

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