



Role of Brahmi Siddha Ksheer Shirodhara in Premenstrual Syndrome-Induced Mood Swings - A Pilot Study

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Background: Premenstrual Syndrome (PMS) is a common condition characterized by emotional and physical symptoms that interfere with daily functioning. Ayurveda describes Shirodhara—the rhythmic pouring of medicated liquids on the forehead—as a therapy to pacify Prana Vata and restore psychosomatic balance. Brahmi (*Bacopa monnieri*), a renowned Medhya Rasayana, possesses neuro-cognitive and stress-modulating properties.

Objective: To evaluate the efficacy of Brahmi Siddha Ksheer Shirodhara in alleviating mood swings associated with PMS.

Methods: A pilot interventional study was conducted on 30 female participants aged 16–40 years. Shirodhara with Brahmi Siddha Ksheer was administered for seven consecutive days, commencing ten days before menstruation, for three consecutive cycles. Outcomes were assessed using the Premenstrual Symptoms Screening Tool (PSST) before and after treatment.

Results: A significant reduction was observed in both Total Symptom Score (28.43 → 21.23; 25.3% improvement) and Functional Impairment Score (14.33 → 10.90; 23.9% improvement) with $p < 0.05$. Participants reported better emotional stability, reduced anxiety, and improved daily performance.

Conclusion: Brahmi Siddha Ksheer Shirodhara demonstrated promising results in mitigating PMS-induced mood swings through its calming, neuro-endocrine-balancing, and Vata-Shamaka effects. Its non-invasive nature and absence of internal medication suggest potential as a safe, effective adjunct in holistic PMS management.

Keywords: Premenstrual syndrome (PMS), Mood swings, Shirodhara, Brahmi (*Bacopa monnieri*), Medhya Rasayana, Ksheer Shirodhara

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Introduction

Shirodhara is the Ayurvedic process of pouring medicated *Drava* like *Taila* (oil), *Ksheer* (milk), *Takra* (buttermilk), or *Kvatha* (decoction) on the forehead with continuous stream in specific manner. Indicated in various disorders, including psychiatric disorders, neurological disorders, generalized anxiety disorders, tension, and headache.[1] In *Ayurveda*, *Brahmi* is described in various texts such as *Charak Samhita*, *Atharva-Veda*, and *Sushruta Samhita* as a *Medhya Rasayana*-herb taken to boost memory and reduce mental deficit.[2] It helps to prevent mental diseases, including mood swings. Ingredients in this herb positively affect the balance of stress hormones in the body. In *Ayurveda*, the head is termed "*Uttamanga*" signifying its supreme importance due to the presence of all five primary sensory organs—eyes, ears, nose, tongue, and skin. These organs serve as the gateways of perception (*Indriyas*), facilitating interaction with the external environment. The *Ayurvedic* therapy known as *Shirodhara* involves the continuous pouring of warm, medicated liquids over the forehead. This process is understood to pacify *Prana Vata*, the subtype of *Vata dosha* responsible for governing sensory functions, mental alertness, and the connection between body and mind. Since *Prana Vata* directly influences the sense organs, regular practice of *Shirodhara* is believed to enhance sensory sharpness and stabilize mental activity. The mind (*Manas*), being intimately linked with sensory inputs, benefits indirectly when these faculties are balanced. As a result, *Shirodhara* promotes both neurosensory coordination and psychological harmony, supporting overall mental and sensory health.[3] Premenstrual Syndrome (PMS) refers to a set of recurring symptoms both emotional and physical that appear in the days leading up to menstruation. Common features include mood swings, difficulty focusing, changes in energy, and physical discomfort. It is viewed as a physiological response to hormonal changes that temporarily influence mood and behaviour.[4] There is an apparent functional impairment in work or personal relationship.[5] According to researchers, nervousness/anxiety (76.4%), mood swings/crying (55.7%), pain, swelling, tenderness of breasts (37.3%), and cramps in lower abdominal (pelvic) region (45.4%) in these patients.[6] Most women in their reproductive age suffer from physical and mental discomfort before menstruation.

Symptoms are mostly mild but may lead to severe discomfort, which hampers daily activities.

Materials and Methods

This pilot interventional study was conducted on a sample of 30 female participants, aged between 16 and 40 years. The intervention involved the administration of *Shirodhara* therapy for a duration of 7 days, starting 10 days prior to the onset of menstruation. This procedure was repeated for three consecutive menstrual cycles. The total duration of the study was three months. *Brahmi Siddha Ksheer* was freshly prepared for each patient at the time of *Shirodhara*, as per the classical reference mentioned in *Sharangdhar Samhita*. One part of the drug is mixed with eight times milk and four times water to milk. It is prepared by boiling till added water is evaporated.[7] The scale used for assessment of before and after result of *Brahmi Siddha Ksheer Shirodhara* was Premenstrual Symptoms Screening Tool (PSST).[8]

Setting

The study was performed at *Striroga Evam Prasuti Tantra* (gynecologically department).

Ethical approval

For this study, IEC approval was received with Ref.No.MGACHRC/IEC/Oct -2022/664. The study was started after getting acceptance from SPARK (Short-term Studentship in Ayurveda Research Ken) team, CCRAS (Central Council for Research in Ayurvedic Sciences), New Delhi.

Patient selection

For this study, patients were selected from the *Striroga evam Prasuti tantra* (gynecologically department) unit, OPD/IPD during working hours during the study period. Patients who had PMS-induced mood swings were included in the study. Female patients 16 to 40 years old were included in the study. All selected patients were explained the *Brahmi Siddha Ksheer Shirodhara* procedure and consent was obtained.

Procedure standardization:

Shirodhara unit comprises instruments which included *Droni* (therapy table), *Dhara Patra* (*Shirodhara* vessel pot) with *Shirodhara* stand. *Droni* resembles a wooden table made from wood of trees such as *Plaksha* (*Ficus lacor*), *Udumbar* (*Ficus racemosa* L.).

The *Droni* (wooden table) measurement was 72 inches long, 18 inches wide, and 4.5 inches high. It comprises two compartments: the head end (18 inches) and the foot end. *Dhara Patra* had a capacity of 1536 gm and can be made up of gold, silver, and other metals (9). This *Patra* was suspended from the stand with the help of cords tied around its rim. It was perforated at its base corresponding to the middle joint of the little finger from where a stream of medicated liquid was poured. An appropriate wick was suspended from the perforation made at its base to maintain a continuous flow. The *Shirodhara* stand was made up of wood, and at its upper end, a hook was present to suspend the *Dhara Patra*. It was firm and stable. The patients were made to plug cotton in both ears and asked to lie on *Droni* in the supine position. The eyes of the patients were covered with round pads of cotton. Freshly prepared, warm *Brahmi Siddha Ksheer* was poured into the *Dhara Patra*. A continuous pouring stream of *Brahmi Siddha Ksheer* from *Dhara Patra* over the forehead above four angula (Approximately 6 to 8 centimetres, based on average finger width) was made for 30 minutes without interruption.[10,11] During the pouring of *Ksheer* (medicated milk) over the forehead, *Dhara Patra* (*Shirodhara* vessel pot) was moved in a pendulum pattern.[12] The Patients were then advised to change and avoid direct exposure to air for a period of 1 hour.

Data Collection

An enrolled patient who had undergone *Shirodhara* procedure was recorded. The data was recorded at baseline (before *Shirodhara*) and three months after completing three consecutive *Shirodhara* sessions. These 2-time point observations before and after *Shirodhara* sessions were considered independent observations and were used in data analysis accordingly.

Study Design

The present study was a Pilot study following the analysis of the 30 patients who were given *Shirodhara* of *Brahmi Siddha Ksheer*, seven to ten days before menses for seven days for three consecutive months for pre-menstrual syndrome-induced mood swings. The study was conducted from February 1, 2023, to April 30, 2023. Patients were enrolled from O.P.D. of *Stree Rog evam Prasuti tantra* (gynecologically department) Department of Institution.

The inclusion criteria for the study were women suffering from PMS-induced mood swings; exclusion criteria were patients having mood swings unrelated to the menstrual cycle and patients on antipsychotic drugs. The patients' Medical History was taken along with the Premenstrual symptoms screening tool (PSST) as an assessment Scale.[13] Patient consent was taken, and privacy was maintained.

Results

To evaluate the significance of treatment outcomes, the Wilcoxon Signed-Rank Test was applied to compare pre-treatment and post-treatment PSST scores due to the ordinal nature of the data and small sample size. Analysis revealed statistically significant reduction in both symptom severity and functional impairment scores following the intervention. Statistically significant improvements were observed in both the Total Symptom Score (TSS) and the Functional Impairment Score (FIS), as assessed using the Premenstrual Symptoms Screening Tool (PSST), following three consecutive cycles of *Brahmi Siddha Ksheer Shirodhara* therapy.

- The mean TSS decreased from 28.43 pre-treatment to 21.23 post-treatment, representing an approximate 25.33% reduction in the severity of PMS-related emotional and physical symptoms.
- The mean FIS declined from 14.33 to 10.90, reflecting a 23.93% improvement in day-to-day functioning.

These changes were found to be statistically significant ($p < 0.05$) based on the Wilcoxon Signed-Rank Test, confirming that the observed improvements were unlikely to be due to chance. The intervention demonstrated potential in reducing emotional symptoms such as irritability, anxiety, mood instability, and restlessness. In addition, participants reported notable improvements in functional domains, including work performance, social interactions, and home responsibilities, as per PSST-based evaluation.

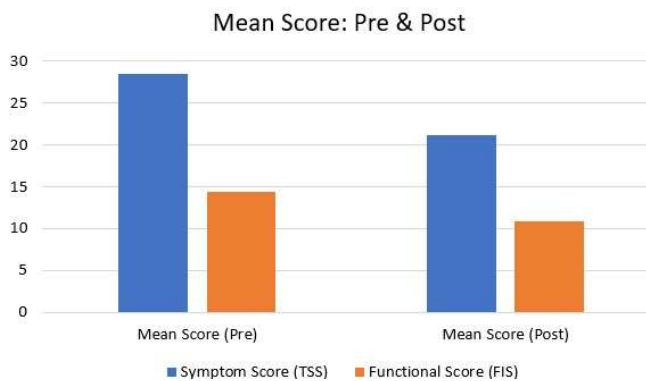
Table 1: Showing changes in the pre-treatment and post-treatment scores

Measure	Mean Score (Pre)	Mean Score (Post)	Standard Deviation (Pre)	Standard Deviation (Post)	% Improvement
Symptom Score (TSS)	28.43	21.23	± 0.00	± 0.00	25.3%
Functional Score (FIS)	14.33	10.90	± 0.00	± 0.00	23.9%

Table 2: Showing significance of treatment

Measure	Pre-Treatment Mean $\pm$ SD	Post-Treatment Mean $\pm$ SD	% Improvement	Wilcoxon Test Statistic (W)	Z-value	p-value	Statistical Significance
Total Symptom Score (TSS)	28.43 $\pm$ 1.14	21.23 $\pm$ 1.16	25.3%	0.00	-4.784	< 0.000001	Highly Significant
Functional Impairment Score (FIS)	14.33 $\pm$ 0.95	10.90 $\pm$ 0.94	23.9%	0.00	-4.799	< 0.000001	Highly Significant

Given its non-invasive nature, absence of internal drug administration, and capacity to deliver psychosomatic balance, *Brahmi Siddha Ksheer Shirodhara* may offer a valuable approach in the management of Premenstrual Syndrome (PMS).

**Figure 1: Mean Score: Pre & Post-treatment.**

Discussion

Shirodhara, a therapeutic procedure invited much attention among the scientific community in the recent past because of its usefulness in various neurocognitive disorders as it does not include any internal drug intake. It is found to be equated with a meditative state; increased serotonin reuptake and reduction in catecholamine are proposed as one of the mechanisms of its action.

The results of this pilot study indicate that *Brahmi Siddha Ksheer Shirodhara* serve as an effective Ayurvedic intervention in reducing emotional and functional disturbances associated with Premenstrual Syndrome (PMS). Statistically significant reductions in Total Symptom Score (TSS) and Functional Impairment Score (FIS) after intervention suggest both symptomatic and functional improvement.

The technique of *Shirodhara*, involving the gentle and continuous pouring of medicated liquid on the forehead, is known to induce a calm, meditative-like state by stimulating the hypothalamic region. This sensory input likely activates the parasympathetic nervous system, helping to reduce physiological stress responses mediated by the hypothalamic-pituitary-adrenal (HPA) axis, resulting in a lowering of cortisol and adrenaline levels.[14]

Neurophysiologically, *Shirodhara* may influence the balance of neurotransmitters, particularly serotonin and norepinephrine, which are often dysregulated in PMS. These neurotransmitters are essential for regulating mood, behaviour, and sleep cycles. The therapy's calming effect may be attributed to the modulation of these neurochemicals, as well as the enhancement of alpha brain wave activity, which is associated with relaxed alertness.[15] The use of *Brahmi* (*Bacopa monnieri*) in the medicated milk (*Ksheer*) adds synergistic value. *Brahmi* is a well-established *Medhya Rasayana*, known for its cognitive-enhancing and stress-reducing effects. Modern studies show that *Brahmi* helps in modulating cortisol levels, enhancing cholinergic transmission, and exerting neuroprotective effects—all of which are beneficial for mood stabilization and cognitive clarity.[16] Milk (*Ksheer*) serves as the base medium and carries properties like *Snigdha* (unctuous), *Shita* (cooling), *Brimhana* (nourishing), and *Vata-Pitta Shamak* (balancing), making it suitable for psychosomatic disorders such as PMS, which often present with *Vata-Pitta* imbalances. In this study, the Total Symptom Score (TSS) reduced by approximately 25.33%, while the Functional Impairment Score (FIS) showed a 23.93% decline, both with p-values < 0.05. These significant changes support the hypothesis that *Brahmi Siddha Ksheer Shirodhara* helps alleviate PMS-induced emotional disturbances and improves day-to-day functioning. The findings align well with earlier research indicating *Shirodhara*'s effect on the autonomic nervous system, neuroendocrine regulation, and emotional wellbeing. The combined action of sensory modulation, herbal neuroprotection, and nourishment may explain the positive outcomes observed. However, as this was a pilot study, limitations such as small sample size should be addressed in future studies. Larger randomized controlled trials, including assessments of cortisol levels, EEG changes, or hormonal assays, would provide more definitive evidence on the mechanisms of this therapy.

Shirodhara may stimulate the forebrain, so the pressure created affects impulse conduction through thermal and tactile receptors.

The prolonged pressure applied to a nerve by *Dhara Dravya* dripping over the forehead interrupts impulse conduction, and the concerned part of the body may go to rest. *Shirodhara* may stimulate the pituitary gland, one of the main glands of the endocrine system, which is situated between the two eyebrows. Continuous pouring of lukewarm *Ksheer* (milk) may cause vasodilation and thus increase the blood flow through the brain. According to the probable mode of action, *Shirodhara* may decrease the brain's adrenaline and cortisone levels, synchronize brain waves, and provide relaxation. The findings of this pilot study suggest that *Brahmi Siddha Ksheer Shirodhara* is an effective therapy for PMS-induced mood swings. Improvements in both Total Symptom and Functional Impairment Scores support its psychoneuroendocrine effects, likely due to the *Medhya* and *Vata*-pacifying properties of *Brahmi* and the calming influence of *Shirodhara* on the hypothalamic-pituitary-adrenal axis. These findings align with *Ayurveda's* understanding of mind-body balance and present a strong case for integrative PMS management.

Conclusion

The findings of this pilot study suggest that *Brahmi Siddha Ksheer Shirodhara* is a promising *Ayurvedic* intervention for managing Premenstrual Syndrome (PMS)-induced mood swings. Statistically significant improvements were observed in both the Total Symptom Score (TSS) and Functional Impairment Score (FIS) as measured by Premenstrual Symptoms Screening Tool (PSST), after three cycles of treatment. The intervention demonstrated potential to alleviate emotional symptoms such as irritability, anxiety, and mood swings, while also improving functional domains including work performance, social participation, and home responsibilities. Given its non-invasive nature, absence of internal drug intake, and psychosomatic benefits, this therapy may serve as an effective complementary approach in PMS management. However, larger-scale randomized controlled trials with extended follow-up periods are warranted to validate these results and explore the broader therapeutic applicability of *Shirodhara* in neuropsychiatric and gynecological conditions.

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