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Research Article

EFFECT OF *PUNARNAVADI KASHAYAM* AND *ASWAGANDHA CHOORNA* IN PREMENSTRUAL SYNDROME

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ABSTRACT

Premenstrual syndrome (PMS) is a common disorder of young and middle-aged women characterized by cyclic occurrence in the luteal phase of the menstrual cycle of a combination of distressing physical, psychological and behavioral changes of sufficient severity to result in deterioration of inter- personal relationships; which remit upon onset or immediately after menstruation. PMS is due to *doshic* imbalance and impairment of *satwa*. Objective of study is to find out the effect of *Punarnavadi kashayam and Aswagandha choornam* in Premenstrual syndrome. Study design was interventional, pre and posttest with a sample size of 20. Females of age group 20-35 years with PMS fulfilling the American College of Obstetrics and Gynecology criteria of PMS were selected. *Punarnavadi Kashayam* in the dose of 48 ml bid, 30 minutes before food and *Aswagandha choorna* in the dose of 3 gm. bid along with *Kashaya*. Administration of drug started 14 days before menstruation and was continued till fourth day of menstruation for three consecutive cycles. Follow up was done for next two consecutive cycles. Patient was assessed on fifth day of menstruation during study period and follow up period. The research drug had shown effectiveness in the treatment of depressive effect, anxiety, fatigue, irritation, depressive thoughts, pain, appetite changes, sleep changes, bloating assessed by premenstrual scale. Both drugs showed effectiveness in normalizing serum sodium and serum potassium levels. Associated premenstrual complaints also subsided. Study concluded that *Punarnavadi kashaya* and *Aswagandha choorna* is very much effective in treating Premenstrual syndrome.

KEYWORDS: Premenstrual Syndrome; *Punarnavadi kashaya; Aswagandha choorna*; ACOG Criteria.

INTRODUCTION

Premenstrual Syndrome is a common disorder of young and middle aged women characterized by cyclic occurrence in the luteal phase of menstrual cycle of a combination of distressing physical, psychological and behavioural changes of sufficient severity to result in deterioration of interpersonal relationships and/or interfere with normal activities which subsides after menstruation. A thorough study of Ayurvedic classics doesn't reveal any condition similar to PMS. PMS can be considered as an event occurring in *Rithuvyateeta Kala* and it may be due to imbalance of *Tridosha.* It is estimated that PMS has 40 million suffers and more than 5 million suffers required medical treatment[1]. Women are affected irrespective of socioeconomic status, race or cultural background. In the modern world women has to manage the double role both as a house wife and as a professional. Women with PMS reported greater number of days with impairment in routine work in comparison with women without PMS, indicating that PMS leads to substantial loss in normal activities, family problems, and increased work absenteeism. Only limited study has been done on Ayurveda to find out efficacy of Ayurvedic formulations on PMS. The conventional management of PMS is related with hormones, antidepressants, SSRI, having so many side effects such as nausea, headache, decreased orgasm, early menopause, insomnia. Therefore a management that would help to reduce the symptoms of PMS and to avoid side effects will be a boon to women hood. *Punarnavadi Kashayam* mentioned in *Bhaisajya Ratnavali* and *Aswagandha Choornam* is selected. It is effective, easily administrable, and cost effective, without any untoward side effects. By this we can contribute a safer drug to the medical field for the benefit of patients, which may devoid of adverse effects and can

project Ayurveda into main stream in treatment of PMS.

AIMS AND OBJECTIVES OF STUDY

To find out the effect of *Punarnavadi Kashayam and Aswagandha Choornam* in Premenstrual syndrome.

MATERIALS AND METHODS

1. **Study Design**

   Pre and Post Interventional study without control.

2. **Study Setting**

   Outpatient department and Inpatient department, Govt. Ayurveda College Hospital for Women and Children, Poojappura, Thiruvananthapuram.

3. **Study Population**

   Females of age group 20-35 yrs. with PMS attending the outpatient department and Inpatient department fulfilling the American College of Obstetrics and Gynecology criteria of PMS.

4. **Inclusion Criteria**

   Females of age group 20-35yrs diagnosed as PMS.

5. **Exclusion Criteria**

   a) Patients with irregular menstruation

   b) Patients undergoing prolonged medication

   c) Known hypertensive patients

   d) Hypothyroidism

   e) Concomitant psychotherapy

   f) Pelvic inflammatory disease

   g) Underlying pathological conditions of breast.

6. **Sample Size:** 20

7. **Sampling Technique**

   Consecutive cases satisfying inclusion criteria till sample size is attained.

8. **Data Collection**

   Primary data will be collected through American College of Obstetrics and Gynecology Criteria, case proforma.

9. **Study Tool**

   American College of Obstetrics and Gynecology Criteria, Case proforma, Symptom assessment by PMS scale.

10. **Procedure**

    Patients eligible for study was selected from study setting as per inclusion criteria. Primary data was collected using American College of Obstetrics and Gynecology criteria and case proforma. Study was conducted in a single group and clinical symptoms of patients were assessed before starting the treatment.

Drug administration

The ingredients of *Punarnavadi kashayam* was purchased, powdered and made into drug packets having 48gm of coarse powder each. The finely powdered *Aswagandha choorna* was made into drug packets having 3 gm. of fine powder each. Mode of preparation was well explained to the patients, along with written advice in their local language. *Punarnavadi Kashayam* was given in the dose of 48ml bid, half an hour before food. *Aswagandha Choorna* was given in the dose of 3 gm. bid along with *Kashaya*. *Pathya Ahara* and *Vihara* were recommended.

Duration of administration

Administration of drug started 14 days before menstruation and was continued till fourth day of menstruation for three consecutive cycles.

Follow up

Follow up was done for next two consecutive cycles.

Assessment

Patients were advised to report on fifth day of menstrual cycle. Patient was assessed on fifth day of menstruation in all three cycles during study period and next two cycles during follow up period.

11. Outcome Variable

Change in level of symptoms such as depressive effect, anxiety, fatigue, irritation, depressive thoughts, pain, appetite changes, sleep changes, bloating were assessed by Premenstrual syndrome scale. Blood serum level of sodium, potassium was assessed on 21st day of first menstrual cycle and on third menstrual cycle during study period.

Parameters for Assessment

Outcome variables are the efficacy measurements of study.

Assessment

Change in level of symptoms such as depressive effect, anxiety, fatigue, irritation, depressive thoughts, pain, appetite changes, sleep changes, bloating were assessed by Premenstrual syndrome scale. Blood serum level of sodium, potassium were assessed on 21st day of first menstrual cycle and on third menstrual cycle during study period.

Statistical Analysis

Changes in level of symptoms such as depressive effect, anxiety, fatigue, irritation, depressive thoughts, pain, appetite changes, sleep changes, bloating was assessed by Wilcoxon's signed rank test. Total symptom score of PMS Scale was assessed by paired t test. Changes in Serum level of Sodium and Potassium was assessed by Paired t test.

Ethical Consideration

The study was approved by Institutional Ethics Committee and certificate of consent from subjects was obtained prior to study.

RESULTS

➢ **Data Related to Socio Demography:** Majority of patients (50%) were in the age group 31-35 years; (60%) were from rural area; (50%) graduated; (50%) office staff. (85%) married; (50%) middle class.

➢ **Data Related to Personal History:** Majority of patients (65%) were having sedentary life style; (80%) were non vegetarians; (60%) were preferring sweet/sour/salty taste; (60%) were

having irregular food intake; (60%) habit of coffee intake; (50%) obese

➢ **Data Related to *Satwa* and *Prakriti*.** (60%) were having *Madhyama satwa*; (50%) *Kapha Vata Prakriti*; (40%) *Vatapitta*; (10%) *Pitta Kapha*.

➢ **Data related to Family History**: (50%) were having familial tendency.

➢ **Percentage Distribution According to Premenstrual Symptoms:** Headache (90%), Breast tenderness/swelling (95%), Sugar/salt craving (70%), Swelling of extremities (85%), Acne (95%), Anger (75%), Mood swing (65%), Sexual disturbance (50%), joint pain (75%), Social withdrawal (65%).

Data Related to Effectiveness of Treatment

Table 1: Effectiveness of Treatment on Depressive Effect

	Depressive effect										Total	Wilcoxon signed rank test (comparison with BT)	
	Never		Rarely		Sometimes		Often		Always				
	N	%	N	%	N	%	N	%	N	%	N	z	p
BT	0	0	1	5.0	3	15.0	11	55.0	5	25.0	20		
AT1	0	0	4	20.0	8	40.0	8	40.0	0	0	20	3.771	<0.001
AT2	1	5.0	9	45.0	6	30.0	4	20.0	0	0.0	20	4.093	<0.001
AT3	6	30.0	8	40.0	6	30.0	0	0.0	0	0	20	4.128	<0.001
AF1	14	70.0	6	30.0	0	0.0	0	0	0	0	20	4.058	<0.001
AF2	18	90.0	2	10.0	0	0.0	0	0	0	0	20	4.005	<0.001

Table 2: Effectiveness of Treatment on Anxiety

	Anxiety										Total	Wilcoxon signed rank test (comparison with BT)	
	Never		Rarely		Sometimes		Often		Always				
	N	%	N	%	N	%	N	%	N	%	N	z	p
BT	0	0.0	1	5.0	5	25.0	10	50.0	4	20.0	20		
AT1	1	5.0	4	20.0	11	55.0	4	20.0	0	0.0	20	4.146	<0.001
AT2	1	5.0	13	65.0	4	20.0	2	10.0	0	0.0	20	4.028	<0.001
AT3	8	40.0	7	35.0	5	25.0	0	0.0	0	0	20	4.006	<0.001
AF1	14	70.0	5	25.0	1	5.0	0	0.0	0	0	20	4.005	<0.001
AF2	16	80.0	4	20.0	0	0.0	0	0	0	0	20	4.034	<0.001

Table 3: Effectiveness of Treatment on Fatigue

	Fatigue										Total	Wilcoxon signed rank test (comparison with BT)	
	Never		Rarely		Sometimes		Often		Always				
	N	%	N	%	N	%	N	%	N	%	N	z	p
BT	0	0.0	0	0.0	6	30.0	9	45.0	5	25.0	20		
AT1	0	0.0	2	10.0	13	65.0	5	25.0	0	0	20	3.771	<0.001
AT2	0	0.0	11	55.0	6	30.0	3	15.0	0	0	20	3.954	<0.001
AT3	6	30.0	9	45.0	5	25.0	0	0.0	0	0	20	3.897	<0.001
AF1	12	60.0	7	35.0	1	5.0	0	0.0	0	0	20	4.005	<0.001
AF2	17	85.0	3	15.0	0	0.0	0	0	0	0	20	4.006	<0.001

Table 4: Effectiveness of Treatment on Irritability

	Irritability										Total	Wilcoxon signed rank test (comparison with BT)	
	Never		Rarely		Sometimes		Often		Always				
	N	%	N	%	N	%	N	%	N	%	N	z	p
BT	0	0.0	0	0.0	3	15.0	11	55.0	6	30.0	20		
AT1	0	0	2	10.0	9	45.0	8	40.0	1	5.0	20	3.638	<0.001
AT2	0	0.0	5	25.0	11	55.0	3	15.0	1	5.0	20	3.782	<0.001
AT3	4	20.0	11	55.0	4	20.0	1	5.0	0	0.0	20	4.055	<0.001
AF1	11	55.0	7	35.0	1	5.0	1	5.0	0	0.0	20	3.970	<0.001
AF2	15	75.0	4	20.0	1	5.0	0	0.0	0	0	20	4.011	<0.001

Table 5: Effectiveness of Treatment on Depressive Thoughts

	Depressive thoughts										Total	Wilcoxon signed rank test (comparison with BT)	
	Never		Rarely		Sometimes		Often		Always				
	N	%	N	%	N	%	N	%	N	%	N	z	p
BT	0	0.0	0	0.0	7	35.0	9	45.0	4	20.0	20		
AT1	0	0.0	6	30.0	7	35.0	6	30.0	1	5.0	20	3.873	<0.001
AT2	0	0	9	45.0	7	35.0	4	20.0	0	0.0	20	3.947	<0.001
AT3	5	25.0	9	45.0	6	30.0	0	0.0	0	0	20	3.983	<0.001
AF1	13	65.0	6	30.0	1	5.0	0	0.0	0	0	20	4.008	<0.001
AF2	16	80.0	4	20.0	0	0.0	0	0	0	0	20	4.005	<0.001

Table 6: Effectiveness of Treatment on Pain

	Pain										Total	Wilcoxon signed rank test (comparison with BT)	
	Never		Rarely		Sometimes		Often		Always				
	N	%	N	%	N	%	N	%	N	%	N	z	p
BT	0	0.0	0	0.0	3	15.0	6	30.0	11	55.0	20		
AT1	0	0.0	3	15.0	4	20.0	12	60.0	1	5.0	20	4.123	<0.001
AT2	0	0.0	6	30.0	10	50.0	4	20.0	0	0	20	4.038	<0.001
AT3	6	30.0	9	45.0	4	20.0	1	5.0	0	0.0	20	3.970	<0.001
AF1	14	70.0	3	15.0	3	15.0	0	0.0	0	0	20	3.976	<0.001
AF2	15	75.0	5	25.0	0	0.0	0	0	0	0	20	3.985	<0.001

Table 7: Effectiveness of treatment on appetite changes

	Appetite change										Total	Wilcoxon signed rank test (comparison with BT)	
	Never		Rarely		Sometimes		Often		Always				
	N	%	N	%	N	%	N	%	N	%	N	z	p
BT	1	5.0	1	5.0	7	35.0	5	25.0	6	30.0	20		
AT1	1	5.0	7	35.0	7	35.0	4	20.0	1	5.0	20	3.690	<0.001
AT2	2	10.0	10	50.0	5	25.0	3	15.0	0	0.0	20	3.727	<0.001
AT3	6	30.0	11	55.0	3	15.0	0	0.0	0	0	20	3.775	<0.001
AF1	16	80.0	3	15.0	1	5.0	0	0.0	0	0	20	3.869	<0.001
AF2	17	85.0	3	15.0	0	0.0	0	0	0	0	20	3.880	<0.001

Table 8: Effectiveness of Treatment on Sleep Changes

| | Sleep change | | | | | | | | | | Total | Wilcoxon signed rank test (comparison with BT) | |
| | Never | | Rarely | | Sometimes | | Often | | Always | | | | |
	N	%	N	%	N	%	N	%	N	%	N	z	p
BT	1	5.0	0	0.0	10	50.0	6	30.0	3	15.0	20		
AT1	1	5.0	9	45.0	7	35.0	2	10.0	1	5.0	20	3.900	<0.001
AT2	4	20.0	11	55.0	3	15.0	2	10.0	0	0.0	20	3.954	<0.001
AT3	10	50.0	8	40.0	1	5.0	1	5.0	0	0.0	20	4.014	<0.001
AF1	18	90.0	1	5.0	1	5.0	0	0.0	0	0	20	3.934	<0.001
AF2	18	90.0	1	5.0	1	5.0	0	0.0	0	0	20	3.934	<0.001

Table 9: Effectiveness of Treatment on Bloating

| | Bloating | | | | | | | | | | Total | Wilcoxon signed rank test (comparison with BT) | |
| | Never | | Rarely | | Sometimes | | Often | | Always | | | | |
	N	%	N	%	N	%	N	%	N	%	N	z	p
BT	0	0.0	0	0.0	3	15.0	8	40.0	9	45.0	20		
AT1	0	0.0	4	20.0	7	35.0	8	40.0	1	5.0	20	3.879	<0.001
AT2	3	15.0	7	35.0	6	30.0	4	20.0	0	0.0	20	4.008	<0.001
AT3	7	35.0	7	35.0	5	25.0	1	5.0	0	0.0	20	4.026	<0.001
AF1	12	60.0	4	20.0	4	20.0	0	0.0	0	0	20	3.994	<0.001
AF2	14	70.0	6	30.0	0	0.0	0	0.0	0	0.0	20	4.029	<0.001

Table 10: Effectiveness of treatment on Total Symptom Score

| | N | Total symptom score | | Paired comparison | Paired Differences | | paired t test | |
		Mean	sd		Mean	sd	t	p
BT	20	35.70	4.92					
AT1	20	28.10	4.81	BT - AT1	7.60	2.95	11.541	<0.001
AT2	20	23.40	5.66	BT - AT2	12.30	4.09	13.441	<0.001
AT3	20	17.45	5.39	BT - AT3	18.25	5.38	15.173	<0.001
AF1	20	12.55	4.77	BT - AF1	23.15	4.82	21.500	<0.001
AF2	20	10.80	2.89	BT - AF2	24.90	4.20	26.488	<0.001

Table 11: Effectiveness of Treatment on Serum Sodium Level

| | N | Sodium level | | Paired Differences | | Paired t test | |
		Mean	sd	Mean	sd	t	p
BT	20	142.45	1.468	3.800	1.105	15.379	<0.001
AT	20	138.65	1.496				

Table 12: Effectiveness of Treatment on Serum Potassium Level

| | N | Potassium level | | Paired Differences | | Paired t test | |
		Mean	sd	Mean	sd	t	p
BT	20	4.03	.212	.420	.151	-12.457	<0.001
AT	20	4.45	.209				

DISCUSSION

Conceptual Discussion

Premenstrual syndrome is having distressing physical, psychological and behavioral symptoms, not caused by organic disease, which regularly recur during same phase of menstrual cycle and which significantly regress or disappear during the remainder of the cycle. Approximately 80% of all women of reproductive age experience psychological, behavioral and physical changes associated with the premenstrual phase[2]. PMS have a very strong negative impact on women's family, work and social life. It hampers women's relationship with their spouse, children and community. More than 150 different symptoms have been attributed to PMS. Some of the major distressing physical symptoms includes headache, breast tenderness and swelling, bloating, pain, swelling of extremities, infection and fatigue. Behavioral symptoms comprises, reduced cognitive abilities, sexual disturbances, social withdrawal, insomnia, food cravings, appetite changes. Psychological symptoms are the most common symptoms for seeking help including mainly tearfulness, irritability, mood swing, anxiety, depression, confusion, anger. PMS is found to have multiple pathophysiological involvements. Ovarian sex steroid level fluctuation is the major culprit in causing physical, psychological and behavioral symptoms of PMS, i.e., alteration in level of estrogen progesterone ratio and diminished progesterone level. Variation in CNS neurotransmitters such as serotonergic dysregulation, low-level GABA, adrenergic dysregulation is responsible for psychological symptoms. The interaction of sex steroids with RAAS, alters fluid and electrolyte balance resulting in fluid retention symptoms. The role of genetic predisposition, Dietary nutritional insufficiency, improper lifestyle and stress are unavoidable factors leading to PMS. PMS is a reflection of sociocultural misbelief and unhealthy mental status.

Ayurveda classics doesn't reveal any condition similar to PMS. *Tridoshas* play equal role in etiopathology of PMS. Considering role of *Pancha vayu*, the psychological and behavioural symptoms can be attributed to *Prana vayu*. Reduced cognitive abilities, forgetfulness, changes in complexion, fatigue can be attributed to *Udana vayu dushti*. *Samana vata* vitiation hampers *Agni* leading to appetite changes. *Vyana vata* vitiation leads to improper nourishment and alters sound mind. *Apana vata* vitiation impairs normal menstruation. *Dooshita Pitta* impairs *agni* leading to appetite changes. Dizziness, insomnia, anger and irritability can be due to *Prakupita pitta*. *Sadhaka pitta* impairment causes forgetfulness, reduced cognitive abilities .Changes in skin and hair can be attributed to *Brajaka pitta*. The symptoms of fluid retention, increased weight gain, sleep changes, fatigue, and infection can be attributed to *Kledaka* and *Tarpaka kapha*.

Samanya nidanas of *Yoniroga* such as *Mithyaachara, Pradushta artava, Beeja dushti* and *Daiva* are also inevitable factors leading to PMS. Under *Mithyaachara*, abnormalities of dietetics, lifestyle changes, mental and physical stress can be considered. Hormonal changes can be considered under *Pradushta artava*. The role of genetic factors and idiopathic factors also be considered. *Dosha Dushti nidanas* can be considered as *Vishesha nidanas* leading to PMS.

Premenstrual syndrome is a pathology occurring in *Rithuvyateeta kala*. There will be *Vata prakopa*, *Pitta* in *Chaya avastha* and *Kapha* in *Ksheena avastha*. *Mithyaahara vihara, Pradushtaaartava, Beeja dosha* and *Daiva* may be the factors predisposing PMS. This will lead to *Tridosha kopa* along with *Agnimandhya* leading to *Srotodushti.* This along with stressful life of modern era predisposes PMS especially in *Heena Satwa* individuals and having *Tamasa, Rajasa prakriti*.

Tridosha dusti along with *Aama* formation, leading to *Srotorodha* and *Srotodushti* in *Rasa, Rakta mamsa, Asthi* and *Artavavaha* occurs. The above factors along with involvement of *Manovaha srotas* causes PMS especially in *Rajasa tamasa* individuals. Therefore treatment should aim at normalizing *Tridoshas* and *Manovaha srotas.*

Discussion on Data Related to Socio Demography

In the present study, the incidence of PMS was higher in women between the age group 31-35 years. Studies done have proven PMS is more prevalent in this age group as they may be afflicted with more familial and work stress leading to hormonal imbalance, which is considered as a major causative factor in PMS[3]. Majority of the patients were having graduation, may be because of low tolerance for stress, unsatisfactory diet and habits leading to PMS. Majority of the patients were office staffs, due to stress and strain in work, family, *Vegadharana*, irregular food habits, and sedentary life style attributes to PMS. Majority of patients were married, as the stress and strain in family, increased responsibilities may be the factor leading to PMS. Majority of patients were from middle class, as the stress and strain in family, may be the factor leading to PMS.

Discussion on Data Related to Personal History

Majority of the patients is having sedentary life style, which is one among major cause of PMS. Exercise increases endorphin and serotonin level, proved to have psychological and physiological benefits which helps to improve PMS symptoms, especially mood swings, depression and fatigue. Majority of patients were having mixed diet. Excess intake of junk foods, especially beef, meat, refined sugar and dairy products are among major predisposing factor of PMS. Majority of patients were preferring sweet/sour/salt taste, which had been proven as a risk factor of PMS. Studies proved that excess intake of this will lead to fluid retention symptoms, lethargy, fatigue and anxiety[4]. Majority of were having irregular food intake, which causes general ill-health and nutritional deficiency. Dietary deficiency of vitamin, magnesium and calcium are proved to be the risk factor leading to PMS. Majority of patients have the habit of coffee intake. Studies have proven excess of caffeine intake as risk factor leading to PMS. Excess amount can result in caffeine intoxication causing psychomotor agitation, thought disorder. Majority of patients were obese. Increased BMI was found to be a risk factor in causing PMS. 60% of the patients were found to anxious /depressed[5]. Stress is considered as one among the major risk factor of PMS by causing hormonal imbalance. Chronic stress can cause an increase in adrenal hormones and ACTH that leads to sodium water retention. Craving can also occur during the time of stress and worsen the situation resulting in feeling low, fatigue, heart pounding and headache.

Discussion on Data Related to *Satwa* and *Prakrit*

Majority of patients is having *Madhyama satwa*, as stress is considered as one among the major risk factor of PMS by causing hormonal imbalance. 50% of patients were having *Kaphavata* and 40% having V*atapitta prakruti*. It substantiate unavoidable role of *Tridosha* in pathogenesis of disease.

Discussion on Data Related to Effectiveness of Treatment

Depressive Effect: Before treatment 55% of patients had often, 25% had always and 15% had sometimes depressive effect .After treatment it was reduced to 0% and treatment effect was maintained during follow up period. A highly significant p value less than 0.001 is obtained after treatment which indicates treatment is highly effective in reducing depressive effect. (Table No. 1)

Anxiety: Before treatment 5% had rarely score, 0% had never score. After follow up 80% had come to never score and 20% to rarely score. Before treatment 50% had always, 25% had sometimes and 20% had always anxiety. This was reduced to 0%

after treatment and treatment effect was maintained during follow up period. A highly significant p value less than 0.001 is obtained after treatment which indicates treatment is highly effective in reducing anxiety. (Table No. 2)

Fatigue: Before treatment 0% had rarely score and never score. After follow up 85% had come to never score and 15% to rarely score .Before treatment 45% had often, 30% had sometimes and 25% had always anxiety. This was reduced to 0% after treatment and treatment effect was maintained during follow up period. A highly significant p value less than 0.001 is obtained after treatment which indicates treatment is highly effective in reducing fatigue. (Table No.3)

Irritability: Before treatment 0% had rarely score and never score. After follow up 85% had come to never score and 15% to rarely score .Before treatment 45% had often, 30% had sometimes and 25% had always anxiety. This was reduced to 0% after treatment and treatment effect was maintained during follow up period. A highly significant p value less than 0.001 is obtained after treatment which indicates treatment is highly effective in reducing irritability. (Table No.4)

Depressive Thoughts: Before treatment 0% had rarely score and never score. After follow up 80% had come to never score and 20% to rarely score. Before treatment 45% had often, after treatment reduced to 5% and after follow up became 0%. Before treatment 35% had sometimes and 20% had always anxiety. This was reduced to 0% after treatment and treatment effect was maintained during follow up period. A highly significant p value less than 0.001 is obtained after treatment which indicates treatment is highly effective in reducing depressive thoughts. (Table No.5)

Pain: Before treatment 0% had rarely score and never score. After follow up 75% had come to never score and 25% to rarely score. Before treatment 55% had always and 30% had often pain. This was reduced to 0% after treatment and treatment effect was maintained during follow up period. A highly significant p value less than 0.001 is obtained after treatment which indicates treatment is highly effective in reducing pain.(Table No.6)

Appetite changes: Before treatment 5% had rarely score and never score. After follow up 85% had come to never score and 15% to rarely score. Before treatment 35% had often, after treatment reduced to 5% and after follow up became 0%. Before treatment 30% had always and 25% had often appetite changes. This was reduced to 0% after treatment and treatment effect was maintained during follow up period. A highly significant p value less than 0.001 is obtained after treatment which indicates treatment is

highly effective in reducing appetite changes. (Table No.7)

Sleep changes: Before treatment 5% had rarely score and never score. After follow up 90% had come to never score and 5% to rarely score. Before treatment 10% had often, after treatment reduced to 5% and after follow up became 5%. Before treatment 30 % had often and 15% had always sleep changes. This was reduced to 0% after treatment and treatment effect was maintained during follow up period. A highly significant p value less than 0.001 is obtained after treatment which indicates treatment is highly effective in reducing sleep changes. (Table No.8)

Bloating: Before treatment 0% had rarely score and never score. After follow up 70% had come to never score and 50% to rarely score. Before treatment 15% had sometimes, after treatment reduced to 20% and after follow up became 0%. Before treatment 40 % had often and 45% had always bloating. This was reduced to 0% after treatment and treatment effect was maintained during follow up period. A highly significant p value less than 0.001 is obtained after treatment which indicates treatment is highly effective in reducing bloating. (Table No.9)

Total Symptom Score: Before treatment total symptom score was 35.70 which were reduced to 17.45 after the treatment and to 10.80 after follow up. So there is reduction in total symptom score. As per Paired t test, we have statistically highly significant p value <0.001, which reveals that the treatment is effective in reducing total symptom score of PMS Scale. (Table No.10)

Serum Sodium and Potassium Level: In the pathophysiology of PMS, there will be an increase in serum sodium level and decrease in serum potassium level. The mean value of Serum Sodium level was 142.45 before treatment and it was reduced to 138.65 after treatment. As per Paired t test we have statistically highly significant p value <0.001, which reveals that the treatment is effective in reducing Serum Sodium level. The mean value of Serum Potassium level was 4.03 before treatment and it was increased to 4.45 after treatment. As per Paired t test we have statistically highly significant p value <0.001, which reveals that the treatment is effective in increasing Serum Potassium level. (Table No.11)

Associated Premenstrual symptoms

Before treatment it was found that 95% of patients presented with breast tenderness /swelling and acne which reduced after treatment and follow up period. 90% presented with headache before treatment, which reduced after treatment and follow up period. 85% presented with swelling of extremities before treatment; 75% with joint/muscle pain and anger before treatment, which reduced after treatment and follow up period. 70% with moderate sugar/salt craving before treatment, which reduced after treatment and follow up period. 65% with moderate infection, social withdrawal and mood swing before treatment; which reduced after treatment and follow up period. 50% with sexual disturbances before treatment, which reduced after treatment and follow up period. There is also significant reduction in symptoms such as general ache and pain, confusion, white discharge.

Discussion on Probable Mode of Action of Drug

✓ While considering *Punarnavadi kashaya*, majority of drugs found to have *Kashaya katu tikta rasa*, *Laghu rooksha guna*, *Ushna veerya* and *Katu vipaka*. Remaining drugs found to have *Madhura amla rasa*, *Snigdha guna*, *Seeta veerya* and *Madhura vipaka*, hence can be considered as *Tridosha samana*.

✓ The drug *Punarnava* is found to be *Sotha soolahara*, *Aamahahara*, *Kasa swasahara*, *Nidranasahara*, *Deepana* and *Vrishya.* Researchers have proven that *Punarnava* is anti-inflammatory, diuretic, expectorant, hepatoprotective, aphrodisiac, anti-inflammatory, antidepressant, antiestrogenic, antistress, adaptogenic, immunomodulatory, GABergic and serotogenric[6]. These properties of Punarnava normalizes serum potassium levels, hormonal fluctuations, neurotransmitter response, RAAS and psychological involvement of PMS. Considering *Nimba*, it is *Soolahara*, *Aanahahara* and is anti-inflammatory, antiarthritic and immunostimulant. *Patola* is *Vrishya, Agnideepana, Kusta kanduhara. Sunti* is *Soolahara, Aadhmanahara, Kasaswasahara, Sophahara, Vibandahara, Kushtahara, Agnimandhyahara* and it is anti-inflammatory, anti-microbial, anti-oxidant, antibacterial. It is found to be effective in the reduction of severity of mood, physical and behavioural symptoms of PMS. The drug *Tikta* is *Kasa swasahara* and *Krimihara.* The drug *Amrita* is *Medhya deepaneeya, Kandughna, Agnideepana* and *Kasa swasahara*. It is found to be anti-rheumatic, diuretic, anti-inflammatory, anti-oxidant, anti-allergic, immunomodulatory, antistress and anti-ulcerogenic. The drug *Darvi* is *Kandughna, Sophaghna, Krimihara, Kasaswasahara* and is anti-bacterial, anti-spasmodic and cardio tonic[10]. Owing to above said properties of drugs of *Punarnavadi kashaya* and since *Punarnavadi kashaya* is *Tridosha samana*, it can act on pathogenesis involved and can reduce symptom complex involved in PMS.

✓ While considering *Aswagandha choornam* is *Tridoshara* mainly *Vatakaphahara, Sophahara, Balya, Vyadhinasana, Nidranasahara, Rasayana, Kasaswasahara.* Researches proved that it has adaptogenic action, GABergic effect, serotogenric effect, phytoestrogenic effect, adrenal rejuvenating effect, Anxiolytic, cognitive enhancing effect, Cardiorespiratory endurant, mood stabilizer, sleep enhancing, memory booster, antiarthritic, antimicrobial, anti-inflammatory effect[7]. Owing to these properties, *Aswagandha choorna* is highly beneficial in reducing physical, behavioural and psychological symptoms of PMS.

CONCLUSION

Premenstrual syndrome is a common condition of young and middle aged women having distressing physical, psychological and behavioural symptoms of sufficient severity to result in deterioration of interpersonal relationships and interfere with normal activities. Though PMS is not life threatening, it can impose significant burden on social, physical activities, impact on psychological wellbeing and overall quality of life. Even though biological factors contributes main etiology of PMS, improper lifestyle practices, dietary factors, psychological stress and sociocultural factors, plays a major role in predisposing PMS. The physical, behavioural and psychological symptoms of PMS can be very well explained in terms of *Doshic* imbalance and impairment of *Manas.* So the treatment should aim on normalizing *Tridoshas* and to increase *Satwa.* Modifications in dietary factors and lifestyle, encouraging physical activities, psychological education and support etc. have a major role in the treatment aspect. The research drug *Punarnavadi kashaya* and *Aswagandha choorna* had shown effectiveness in the treatment of depressive effect, anxiety, fatigue, irritation, depressive thoughts, pain, appetite changes, sleep changes, bloating assessed by premenstrual scale; Owing to the properties such as *Tridoshaharatwa, Soolaharatwa, Sothahara* and *Aadhmanahara* of *Punarnavadi kashaya* and *Tridoshaharatwa, Sophaharatwa, Nidranasahara, Vyadhinasana* properties of *Aswagandha.* Both research drug showed effectiveness in normalizing serum sodium and serum potassium levels. Associated premenstrual complaints also subsided. So it can be concluded that study drug *Punarnavadi kashaya* and *Aswagandha choorna* is very much effective in treating Premenstrual syndrome.

REFERENCES

1. Zeinab Samadi, Farzaneh Taghian , Mahboubeh Valiani. The effects of 8 weeks of regular aerobic exercise on the symptoms of premenstrual syndrome in non-athlete girls. Iran J Nurs Midwifery Res. Jan-Feb; 18(1): 14–19.

2. Eliana Goncalves V. Souza, Melissa G. Ramos, Cláudia Hara, Bárbara Perdigao Stumpf, Fabio L. Rocha. Neuropsychological performance and menstrual cycle: a literature review. Trends Psychiatry Psychother. 2012; 34 (1):12-16.

3. Qing Liu.Yongshun wang. Stress reactivity and emotion in premenstrual syndrome. Neuropsychiatr Dis Treat. 2017; 13: 1597–1602

4. Amany Edward Seedhom. Eman Sameh Mohammed. Life Style Factors Associated with Premenstrual Syndrome among El-Minia University Students, Egypt.2013.

5. Marry Lee Baron. Louise H Farack. Associations between Psychiatric Disorders and Menstrual Cycle Characteristics. Arch Psychiatr Nurs.2008; 22(5):254-265.

6. Pooja Verma A, LaL V.K. Punarnava-A Natural Remedy by Ayurveda. Int J Pharm Pharm Sci, 2014; Vol 6, Issue 8, 1-6

7. Jaysing Salve, Sucheta Pate, Khokan Debnath, and Deepak Langade. Adaptogenic and Anxiolytic Effects of Ashwagandha Root Extract in Healthy Adults: A Double-blind, Randomized, Placebo-controlled Clinical Study. 2019 Dec; 11(12): 6466.

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