

## EVALUATION OF THE EFFICACY OF NAGARADI KWATH IN THE MANAGEMENT OF VATAJA ARTAVA DUSTI (PRIMARY DYSMENORRHEA) - A CASE SERIES STUDY

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### ABSTRACT

**Introduction:** Almost every woman, experience one or the other types of menstrual problem in her lifetime. In Ayurvedic classics, most of the menstrual disorders have been described under the heading Asta Artavadusti and Asrigdara. Ayurveda defined Vataja Artavadusti as artava vitiated by vata excreted with pain and reddish or blackish in colour. This condition resembles with the description of Primary dysmenorrhea. **Purpose:** In this present study efficacy of Nagaradi kwath in the management of Vataja Artava dusti was studied. **Design:** Case series. **Methods:** 30 numbers of patients were randomly selected from Prasuti and Stree Roga dept. of Govt. Ayurvedic College, Guwahati and Nagaradi kwath was given from 1<sup>st</sup> day of menses to 7<sup>th</sup> day for three consecutive menstrual cycle. **Result:** After completion of the study, it is revealed that Nagaradi kwath is highly effective in Vataja Artava dusti due to its Vatashamak and Shoolahara properties.

**KEYWORDS:** Vataja Artavadusti, Nagaradi kwath, Primary dysmenorrhoea.

### INTRODUCTION

The onset of menstruation is the hallmark of female growth and development. Ayurveda mentions not only curative but also preventive aspect of treatment for maintenance of health. That's why different gynaecological disorders along with their treatment principles, have

been mentioned in the Ayurvedic classics under the heading 'Asta Artavadusti'. Vataja artava dusti is one among Asta aratava dusti<sup>[1,2,3,4,5,6,7]</sup> (eight types of menstrual disorders).

रजोरक्त परीक्षेत वातपित्तकफात्मकम् ॥

सरुजञ्च सकृष्णञ्च पक्कजम्बूनिभं च यत् ॥

वातेन बाधितं पुष्पं तच्च संलक्षयेद्बुधः ॥ Harita Samhita /Tritiya Sthan/48/(13-15)

According to Acharya Harita Vataja Artava Dusti is defined as artava vitiated by vata excreted with pain and reddish or blackish in colour. Dysmenorrhea<sup>[8,9,10]</sup> is a common menstrual complaint which have a major impact on women's quality of life including productivity and healthcare utilisation. The condition of Vataja Artava Dusti resembles with the description of Primary Dysmenorrhea. On the basis of symptom menstruation along with pain, it appears to be nearer to Primary Dysmenorrhea.

In Vataja Artava Dusti, vata is the main dosha involved so, vata samak chikitsa is the best treatment modality.

According to Acharya Harita in Vataja Artava Dusti<sup>[1]</sup>, Nagaradi kwath mixed with guda or dadhi should be given for 7 days during menstruation.

Nagaradi kwath ingredients are Nagara, Pippali, Musta, Dhanvayasa, Brihati, Kantakari and Patala. All these drugs are having Vatahara, Shulahara, Dipaniya properties and also having the pharmacological properties of Antispasmodic, Anti inflammatory, Analgesic, Smooth muscle relaxants. Hence Nagaradi kwath<sup>[1]</sup> is selected for the study in the management of Vataja Artava Dusti.<sup>[1,2,3,4,5,6,7]</sup>

## AIMS AND OBJECTIVES

### AIM OF THE STUDY

- Evaluation of the efficacy of *Nagaradi Kwath*<sup>1</sup> in the management of *Vataja Artava Dusti*.

### OBJECTIVES OF THE STUDY

- Comprehensive study of *Vataja Artava Dusti* and Primary Dysmenorrhea in detail.
- To assess the efficacy of *Nagaradi Kwath* in the management of *Vataja Artava Dusti*.

***Hypothesis***

*Nagaradi kwath* is effective in *Vataja Artava Dusti*.

**MATERIALS AND METHODS**

In the present study an Open Randomized Clinical Trial of *Nagaradi kwath* has been carried out to evaluate its efficacy in *Vataja Artava Dusti*.

**(A) CRITERIA FOR SELECTION OF DRUGS**

Acharya Harita mentioned in Harita Samhita Tritiya sthan 48<sup>th</sup> chapter sloka no (13-15) that in *Vataja Artava Dusti*, *Nagaradi kwath* mixed with guda should be given for one week during menstruation.

*Nagaradi kwath* ingredients are *Nagara*, *Pippali*, *Musta*, *Dhanvayasa*, *Brihati*, *Kantakari* and *Patala* and *Guda*.

All these drugs are having *Vatahara*, *Shulahara*, *Dipaniya* properties and also having the pharmacological properties of Antispasmodic, Anti-inflammatory, Analgesic, Smooth muscle relaxants.

Thus, this drug is selected for the present clinical study.

**(B) SOURCE OF DATA**

30 numbers of patients suffering from Painful menses (diagnosed as *Vataja Artava Dusti*) are randomly selected from OPD and IPD of *Prasuti Tantra and Stree Roga* Department of Govt. Ayurvedic college & Hospital, Guwahati-14, Assam.

**(C) COUNSELLING AND CONSENT**

The patients were registered for the present clinical study with the help of pro-forma prepared. All the patients in the study were done proper counseling and written consent were taken from each and every patient before initiation of the study.

**(D) CRITERIA FOR DIAGNOSIS**

To record the details, clinical pro-forma has been prepared incorporation all the signs and symptoms based on the disease concerned.

**(E) SELECTION CRITERIA****Inclusion Criteria**

- All women of reproductive age-group.
- Patients with the chief complaint of painful menses for at least 3 cycles (having regular menstrual cycles)

**Exclusion Criteria**

1. Patients with any pelvic pathology such as Fibroid, Adenomyosis, Endometriosis, PID, Malignancy of pelvic organs etc.
2. Patients suffering from acute infections, Menorrhagia.
3. Patients with Systemic diseases like Diabetes mellitus, Chronic Kidney Disease, HIV, Tuberculosis etc.

**Subjective Parameters**

- *Vedana* (Pain) during menstruation
- *Artava Varna* (Reddish or blackish menstrual Blood)
- *Artava Praman* (Scanty bleeding)
- *Chardi* (Vomiting)
- *Atisara* (Diarrhoea)
- *Vibandha* (Constipation)
- *Aruchi* (Loss of appetite)

**Criteria for withdrawal:** Development of any complications.

**(F) EXAMINATION OF THE PATIENT**

- The detailed history of the present complaint with duration and associated symptoms, were taken on predesigned specific proforma.

**Clinical Examination**

**General Examination:** In the general condition of the patient. Pulse, Temperature, BP, Pallor, Icterus, Clubbing, Cyanosis, Oedema, Height, Weight etc. noted.

**Systemic Examination:** Examination Central Nervous System, Gastrointestinal system Cardiovascular system, Nervous System, Urogenital system, noted.

**Local examination****Per Abdomen examination**

- Inspection: Incisional scar, prominent veins over abdomen are examined and tenderness if any.
- Palpation: Any palpable mass
- Auscultation: Bowel sound

**Per vaginal examination**

- Inspection: Any kind of growth, ulcer, scarring, lesions or discharge.
- P/V: Any discharge, vaginal mass like Bartholin cyst or Gartner cyst, vaginal atrophy or vaginal prolapse
- Per Speculum Examination: Cervical erosion, congestion, inflammation, ulceration, bleeding, polyp, ectropion or any abnormal discharge.

**(G) INVESTIGATIONS**

- Hematological: Hb%, TC, DLC, ESR, Sr. bilirubin
- Immunological: HIV, HBsAg, VDRL
- Urine: R/E, C/S
- Biochemical: Blood sugar, Blood urea
- Ultra sonography of lower abdomen to rule out any uterine and adnexal pathology.

**(H) PREPARATION OF THE TRIAL DRUG**

**Trial Drug: Nagaradi Kwath<sup>[1]</sup>**

**Table no.1:**

SL. No.	Name of the Drugs	Proportion
1	<i>Nagara</i>	1 Part
2	<i>Pippali</i>	1 Part
3	<i>Musta</i>	1 Part
4	<i>Dhanvayasa</i>	1 Part
5	<i>Brihati</i>	1 Part
6	<i>Kantakari</i>	1 Part
7	<i>Patala</i>	1 Part
8	<i>Water</i>	16 Part
9.	<i>Guda</i>	Q. S

The preparation is done in State Ayurveda Pharmacy, GACH under the guidance of the In-charge, State Ayurveda Pharmacy, GACH Guwahati, Assam after identifying all the drugs from the Dravyaguna Department of Govt. Ayurvedic College, Guwahati, Assam.

## PREPARATION METHOD OF TRIAL DRUG

1. Preparation of *Nagaradi kwath*.<sup>[1]</sup>
2. Preparation of *Nagaradi kwath* in syrup form.

### Preparation of *Nagaradi kwath*

The compositions of *Nagaradi kwath* are *Nagara*, *Pippali*, *Musta*, *Dhanvayasa*, *Brihati*, *Kantakari* and *Patala*. First all the raw drugs are taken in dried form. For kwath preparation all the raw drugs are taken as equal quantity then boiled with 16 times of water. Reduced to 1/8<sup>th</sup> part and filtered. this filtered is taken as *Nagaradi kwath*.

## JUSTIFICATION OF NAGARADI KWATH IN SYRUP FORM PREPARATION

*Guda* is mentioned as *anupan* in *Nagaradi Kwath*<sup>[1]</sup> by *Acharya Harita* and also Syrup is good palatable. High osmotic pressure in syrup prevents the growth of bacteria, fungi, moulds, thus preventing decomposition. So, it is decided to prepare *Nagaradi Kwath* in syrup form by adding *Guda*.

### Preparation of *Nagaradi kwath* in syrup form

*Acharya Harita* mentioned that *Nagaradi kwath*<sup>[1]</sup> should be taken with *guda*. So, in this trial the trial drug is made as in syrup form by adding *guda*. Benefits of syrup formations are

- High osmotic pressure prevents the growth of bacteria, fungi and moulds thus can be stored for long time.
- A good palatable and easy to carry anywhere.

First the prepared *Nagaradi kwath* is taken in a large vessel and equal part of *guda* is added and boiled over mild fire until the liquid attains the syrupy consistency. It is later on filtered and packed in 500 ml bottles and stored in a cool dark place.

### Packing Size– 500 ml

- The Prepared medicine (*Nagaradi kwath*) was tested in State Drug Testing Laboratory (AYUSH) Guwahati, Assam.

**Storage** –Stored in a cool place in tightly closed containers, protected from light and moisture.

### Method of Administration of the Drug

- Drug administered: *Nagaradi kwath*<sup>[1]</sup>

- Mode of administration: Oral
- Dosage: 16 ml (approx. 3 table spoon) 8 hourly after food.
- Administration time: 7 days in each menstrual cycle (starting from 1st day of menstruation)
- Duration of treatment: Trial drug was given for 3(three) consecutive menstrual cycles.



**Pic: Nagaradi kwath.**

### **(I) PARAMETER FOR ASSESSMENT**

Symptomatic relief of sign and symptoms.

The prominent or cardinal symptoms are

1. *Vedana* (Pain) during menstruation
2. *Artava Varna* (Reddish or blackish menstrual Blood)
3. *Artava Praman* (Scanty menstrual bleeding)

Associated symptoms were assessed on the basis of

1. *Chardi* (Vomiting)
2. *Atisara* (Diarrhoea)
3. *Vibandha* (Constipation)
4. *Aruchi* (Loss of appetite)

**(J) SCORING PATTERN OF THE CARDINAL SYMPTOMS<sup>[18]</sup>**

Scoring pattern of symptoms were assessed by verbal multi-dimensional scoring system for assessment of Dysmenorrhea severity.<sup>[18]</sup>

**Table no.2.**

<b>Cardinal symptoms</b>	<b>Grade 0</b>	<b>Grade 1</b>	<b>Grade 2</b>	<b>Grade 3</b>
Vedana(pain)	Menstruation is not painful and patient can carry out her daily activities	Menstruation is painful but daily activity is not affected	Menstruation is painful and patient uses an analgesic drug to get relief	Menstruation is very painful that the patient is unable to carry out her daily works
Artavavarna (colour of menstrual blood)	Bright red	Dark red	Blackish	Purple
Artavapramana (amount of bleeding)	4-5 fully soaked pads/day	4-5 moderately soaked pads/day	4-5 slightly soaked pads/day	Spotting during menses, 4-5 spotting pads/day
<b>Associated symptoms</b>				
Chardi (vomiting)	Absent	Occasional	1-2 episodes of vomiting	Vomiting present when pain occurs and persists throughout menstruation
Atisara (diarrhoea)	Absent	Occasional	2-3 times/day	More than 3 episodes of diarrhea/day
Vibandha (constipation)	Absent	Stool passed daily but constipated	Stool passed on alternate days	Stool not passed even for 3-4 days
Aruchi(loss of appetite)	Absent	Moderate appetite and appearance of appetite for next meal	Low appetite and delayed appearance of appetite in next meal	Persistence of low appetite

**STATISTICAL ANALYSIS**

The data collected were first arranged under

- Demographic data
- Data related to chief complaints
- Data related to response of treatment.



The data collected were rendered into a master chart and statistical table were constructed by the help of Microsoft Excel of computer. Paired t-test was carried out to evaluate the results obtained.

Demographic data and data related to chief complaints were analysed by making tables and computing percentage.

Data related to response of treatment were scientifically analysed by statistical methods like Mean, Standard Deviation, t-value and p-values were calculated.

### **FINAL ASSESSMENT**

It will be based on clinical improvement of symptoms.

Gradation of the parameter after the therapy of trial drug;

- Grade-0: Cured – Complete cessation of symptoms.
- Grade-1: Moderate improvement – Moderate Reduction of symptoms.
- Grade-2: Mild improvement – Mild changes of symptoms.
- Grade-3: No change /Aggravated – Symptoms become more severe or No improvement of specific symptoms.

The final assessment of overall effect of the therapy was done by below mentioned criteria;

- 1) Cure: 100% free from individual sign and symptoms.
- 2) Moderate improvement: 50-75% improvement from individual sign and symptoms.
- 3) Mild improvement: 25-50% improvement from individual sign and symptoms.
- 4) No improvement: <25% improvement from individual sign and symptoms.

### **OBSERVATIONS AND RESULTS**

Clinical data are recorded and presented under the following heading:

- Result on quantitative and qualitative data.
- Result according to assessment criteria.

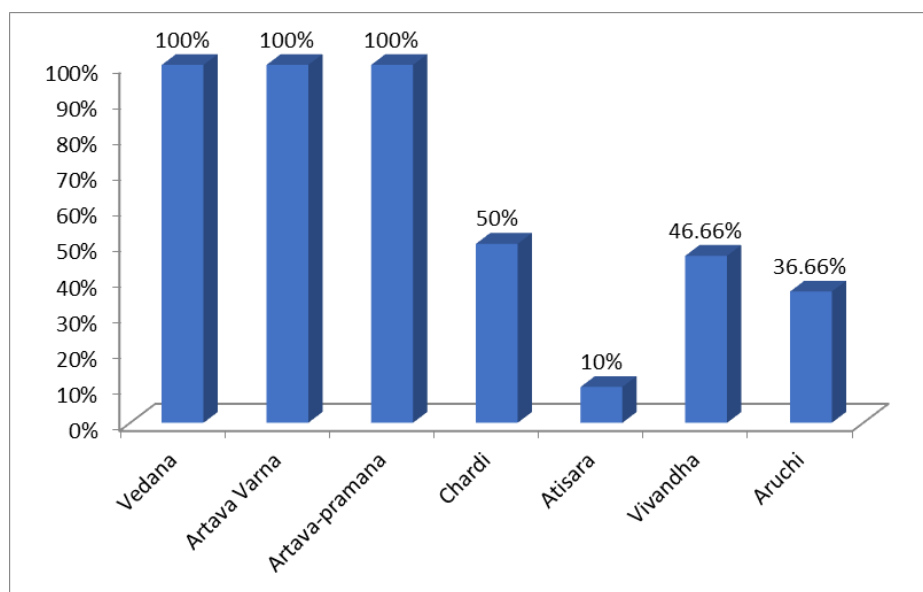
### **CLINICAL REVIEW**

Qualitative as well as quantitative data were noted down before treatment and after treatment and are assessed on the basis of scoring given to them. Statistical analysis of all these symptoms has been explained as below:

**Table no 3: Symptom wise distribution of 30 patients.**

Cardinal Symptoms	No. of patients	Percentage
1.Vedana (Pain)	30	100%
2.Artava Varna (Reddish or blackish menstrual blood)	30	100%
3.Artava-pramana (Scanty menstrual bleeding)	30	100%
<b>Associated Symptoms</b>		
1. Chardi (Vomiting)	15	50%
2. Atisara (Diarrhea)	3	10%
3. Vivandha (Constipation)	14	46.66%
4. Aruchi (Loss of appetite)	11	36.66%

The above table shows that out of 30(100%) patients, 30 patients have the symptoms of Vedana (pain), Artava Varna (Reddish or blackish menstrual blood), and Artava pramana (Scanty menstrual bleeding). Other 50% patients have symptoms of Chardi (Vomiting), 46.66% patients have Vivandha (Constipation), 36.66% patients have Aruchi (Loss of appetite) and only 10% patients have Atisar (Diarrhoe).

**Fig. 1: Symptom wise distribution of 30 patients.****Table no. 4: Assessment After third follow up.**

Cardinal Symptoms	Before treatment		After Third follow up							
			Cured		Moderate improvement		Mild improvement		No improvement	
	No. of patients	%	No. of patient	%	No. of patients	%	No. of patients	%	No. of patients	%
1.Vedana (Pain)	30	100	27	90	3	10	0	0	0	0
2.Artava Varna (Reddish or blackish	30	100	30	100	0	0	0	0	0	0

menstrual Blood)										
3.Artava-pramana (Scanty menstrual bleeding)	30	100	27	90	3	10	0	0	0	0
Associated symptoms										
1.Chardi (Vomiting)	15	50	15	100	0	0	0	0	0	0
2.Atisara (Diarrhea)	3	10	3	100	0	0	0	0	0	0
3.Vivandha (Constipation)	14	46.66	14	100	0	0	0	0	0	0
4.Aruchi (Loss of appetite)	11	36.66	11	100	0	0	0	0	0	0

### Result After Third Follow Up

#### Result on Cardinal symptoms

After completion of the study, the statistical evaluation showed that clinically 30 patients have severity and intensity of pain during menstruation,

- In case of severity and intensity of pain during menstruation, out of 30 patients, 27(90%) patients were cured, 3(10%) patients had moderate improvement.
- Out of 30 patients affected by Artava praman (Scanty menstrual bleeding), 27(90%) patients were cured and 3(10%) patients showed moderate improvement in amount of menstrual bleeding.
- Out of 30 patients affected by Artava Varna (Reddish or blackish menstrual blood), 30(100%) patients were cured.

#### Results of Associated symptoms

- Out of 15 patients with Chardi(vomiting), 15(100%) patient was cured.
- Out of 14 patients with Vivandha(constipation), 14(100%) patients were cured.
- Out of 11 patients with Aruchi (Loss of appetite), 11 (100%) patients were cured.
- Out of 3 patients with diarrhoea, 3(100%) patients were cured.

### STATISTICAL REVIEW

Qualitative data were noted down before and after treatment and were assessed on the basis of scoring given to them. Statistical analysis of all the symptoms has been explained as below.

**Table no. 5: Effect of trial drug on Vedana (Pain during menstruation) of *Vataja Artava Dusti***

Symptoms	$\bar{X}_{BT}$ $\pm SD$	$\bar{X}_{AT}$ $\pm SD$	SED	$t_{29}$	P	Remarks
1 <sup>st</sup> follow up (after 1 <sup>st</sup> menstrual cycle)	2.30 $\pm$ 0.60	1.30 $\pm$ 0.60	0.082	15.425	< 0.0001	Highly significant
2 <sup>nd</sup> follow up (After 2 <sup>nd</sup> menstrual cycle)	2.30 $\pm$ 0.60	0.20 $\pm$ 0.41	0.088	23.9299	<0.0001	Highly significant
3 <sup>rd</sup> follow up (after 3 <sup>rd</sup> menstrual cycle)	2.30 $\pm$ 0.60	0.10 $\pm$ 0.31	0.101	21.8746	<0.0001	Highly significant

### Interpretation

After one month of treatment,  $t_{29}$  is 15.425,  $p < 0.0001$ , which implies the effect of the trial drug is highly significant.

After two months of treatment,  $t_{29}$  is 23.9299,  $p < 0.0001$ , which implies the effect of the trial drug is highly significant.

After three months of treatment,  $t_{29}$  is 21.8746,  $p < 0.0001$  which implies the effect of the trial drug is highly significant.

**Table no. 6: Effect of trial drug on Artava Varna (Reddish or blackish menstrual blood) and Artava Praman (Scanty menstrual bleeding).**

Sl no.	Symptoms	$\bar{X}_{BT}$ $\pm SD$	$\bar{X}_{AT}$ $\pm SD$	SED	$t_{value}$	P	Remarks
1	Artava Varna (Reddish or blackish menstrual Blood)	2.07 $\pm$ 0.25	0.00 $\pm$ 0.00	0.046	$t_{29}=44.6166$	<0.0001	Highly significant
2	Artava-pramana (Scanty menstrual bleeding)	1.17 $\pm$ 0.38	0.10 $\pm$ 0.31	0.095	$t_{29}=11.2174$	<0.0001	Highly significant

### INTERPRETATION

The above table shows that –

1. After treatment  $t_{29}=44.6166$ ,  $P < 0.0001$ . So, the effect of trial drug is highly significant on reducing Artava Varna (Reddish or blackish menstrual Blood).
2. After treatment  $t_{29}=11.2174$ ,  $P < 0.0001$ , so the effect of the trial drug is highly significant on reducing scanty menstruation.

**Table no. 7: Effect of trial drug on Associated Symptoms.**

Sl no.	Associated Symptoms	$\bar{X}_{BT} \pm SD$	$\bar{X}_{AT} \pm SD$	SED	t <sub>value</sub>	P	Remarks
1	Chardi (Vomiting)	1.47±0.74	0.00±0.00	0.192	t <sub>14</sub> = 7.6429	<0.0001	Highly significant
2	Vivandha (Constipation)	1.21±0.43	0.00±0.00	0.114	t <sub>13</sub> =10.6700	<0.0001	Highly significant
3	Aruchi (Loss of appetite)	1.55±0.52	0.00±0.00	0.157	t <sub>10</sub> = 9.8150	<0.0001	Highly significant

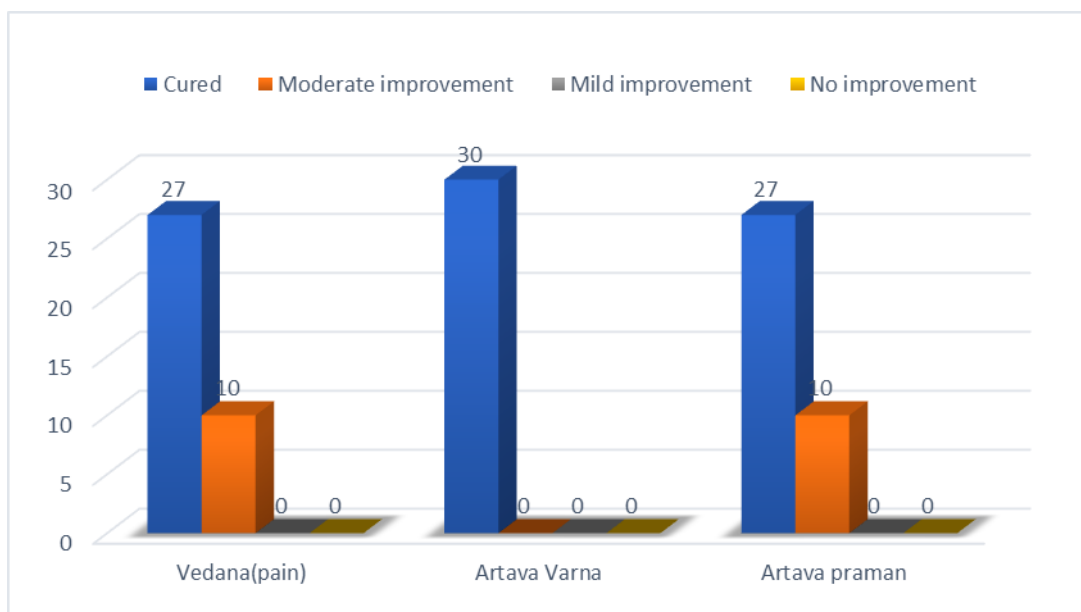
**INTERPRETATION**

The above table shows that –

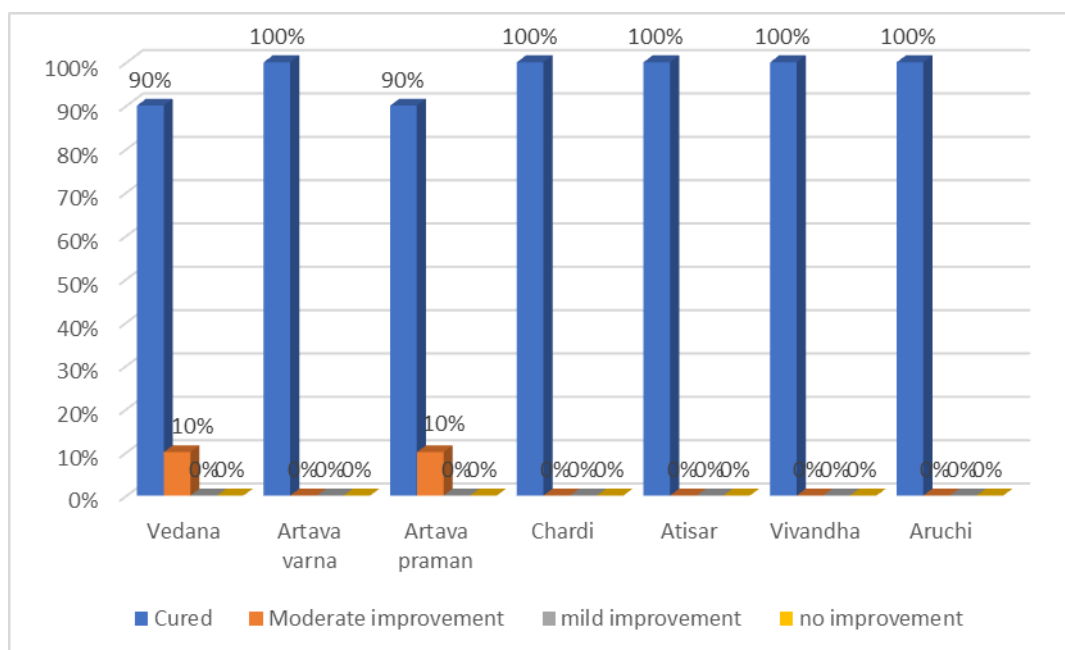
1. Chardi (Vomiting) t<sub>14</sub> = 7.6429, P < 0.0001, so the effect of the trial drug is statistically highly significant on Chardi.
2. Vivandha(Constipation) t<sub>13</sub> =10.6700, P < 0.0001, so the effect of the trial drug is statistically highly significant on Vivandha.
3. Aruchi(Loss of appetite) t<sub>10</sub> = 9.8150 P < 0.0001, so the effect of the trial drug is statistically highly significant on Aruchi.

**Table no. 8: Final Assessment.**

Cardinal Symptoms	Before treatment		After Treatment							
			Cured		Moderate improvement		Mild improvement		No improvement	
	No. of patients	%	No. of patient	%	No. of patients	%	No. of patients	%	No. of patients	%
1.Vedana (Pain)	30	100	27	<b>90</b>	3	<b>10</b>	0	0	0	0
2.Artava Varna (Reddish or blackish menstrual Blood)	30	100	30	<b>100</b>	0	<b>0</b>	0	0	0	0
3.Artava-pramana (Scanty menstrual bleeding)	30	100	27	<b>90</b>	3	<b>10</b>	0	0	0	0
Associated symptoms										
1.Chardi (Vomiting)	15	50	15	<b>100</b>	0	<b>0</b>	0	0	0	0
2.Atisara (Diarrhea)	3	10	3	<b>100</b>	0	<b>0</b>	0	0	0	0
3.Vivandha (Constipation)	14	46.66	14	<b>100</b>	0	<b>0</b>	0	0	0	0
4.Aruchi (Loss of appetite)	11	36.66	11	<b>100</b>	0	<b>0</b>	0	0	0	0



**Fig. 2: Final assessment of Cardinal symptoms.**



**Fig.3: Final assessments of Cardinal and Associated symptoms of Vataja Artava Dusti.**

### Result on Cardinal symptoms

After completion of the study, the statistical evaluation showed that clinically 30 patients have severity and intensity of pain during menstruation,

- In case of severity and intensity of pain during menstruation, out of 30 patients, 27 (90%) patients were cured, 3 (10%) patients had moderate improvement.
- Out of 30 patients affected by Artava Varna (Reddish or blackish menstrual blood), 30 (100%) patients were cured.

- Out of 30 patients affected by Artava praman (Scanty menstrual bleeding), 27 (90%) patients were cured and 3 (10%) patients showed moderate improvement in amount of menstrual bleeding.

### Results of Associated symptoms

- Out of 15 patients with Chardi (vomiting), 15 (100%) patient was cured.
- Out of 14 patients with Vivandha (constipation), 14 (100%) patients were cured.
- Out of 11 patients with Aruchi (Loss of appetite), 11 (100%) patients were cured.
- Out of 3 patients with diarrhoea, 3(100%) patients were cured.

### DISCUSSION

From the description of Vataja artava dusti, it can be said that the disease *Vataja Artava Dusti* is predominantly caused by *apana vayu dusti* and its pathogenesis i.e *Vimargagaman* of *vayu* plays an important role.

In the pathogenesis of the disease, Vayu is vitiated by mainly three causes -

- i) *Margavarodha* i.e., obstruction either physiological or anatomical.
- ii) *Vimargagaman* i.e. moving towards different directions other than normal.
- iii) *Dhatukshaya* i.e., low threshold or decreased production.
- iv) *Swanidana Prakopa* i.e., due to Vata aggravating factors of Vayu.

From the above description of ,it is found that, due to vitiated *vata*, the menstruation appears with is painful, and the color of blood becomes darker the longer it stays inside the uterus and vagina because it starts to react with oxygen. The oxidizing reaction causes the color to get darker. The longer the blood stays inside body, the darker it gets like blackish or reddish in color.

The ingredients of *Nagaradi Kwath* are *Nagara*, *Pippali*, *Musta*, *Dhanvayasa*, *Brihati*, *Kantakari*, *Patala* and *Guda*.

Table no. 9: Ingredients of *Nagaradi Kwath*.

Sr. no	Drug	Latin name	Rasa	Guna	Virya	Vipak	Karma	Part used
1	<i>Nagara</i> <sup>[13,14]</sup>	<i>Zingiber officinale</i> Rosc.	<i>Katu</i>	<i>Guru, ruksha, tikshna</i>	<i>Usna</i>	<i>Madhur</i>	<i>Vata kaphahara, Deepana, Bhedan, shulahara</i>	Dried Rhizome
2	<i>Pippali</i> <sup>[16]</sup>	<i>Piper longum</i> Linn	<i>Katu</i>	<i>Laghu, snigdha, tikshna</i>	<i>Usna</i>	<i>Madhur</i>	<i>Vatakaphahara, Deepana, shulahara</i>	Fruit
3	<i>Musta</i> <sup>[17]</sup>	<i>Cyperus rotundus</i> Linn	<i>Tikta, katu, Kasaya</i>	<i>Laghu, ruksa</i>	<i>Sita</i>	<i>katu</i>	<i>Kapha pitta hara, deepana, pachana, grahi</i>	Tubers
4	<i>Dhanvayasa</i> <sup>[11]</sup>	<i>Fagonia cretica</i> Linn	<i>Madhur Tikta, kasaya</i>	<i>Laghu,</i>	<i>Sita</i>	<i>Madhur</i>	<i>Kaphahara, Vatahara jwarahara, balya</i>	Whole plant
5	<i>Brihati</i> <sup>[12]</sup>	<i>Solanum indicum</i> Linn	<i>Katu, tikta</i>	<i>Laghu, ruksha</i>	<i>Usna</i>	<i>katu</i>	<i>Kapha vatahara, shulahara</i>	Whole plant
6	<i>Kantakari</i> <sup>[12]</sup>	<i>Solanum xanthocarpum</i>	<i>Katu, tikta</i>	<i>Laghu, ruksa, tiksna</i>	<i>Usna</i>	<i>katu</i>	<i>Kaphavatahara, dipana, pacana,</i>	Whole plant
7	<i>Patala</i> <sup>[15]</sup>	<i>Stereospermum sauealens</i> DC	<i>Tikta, kasaya</i>	<i>Laghu, ruksa</i>	<i>Anusna</i>	<i>katu</i>	<i>Tridoshhara</i>	Bark,
8	<i>Guda</i>	<i>Saccharum Officinarum</i>	<i>Madhur</i>	<i>Laghu</i>	<i>Usna</i>	<i>Madhur</i>	<i>Tridoshhara</i>	Whole

**The pharmacodynamics properties of Nagaradi kwath can be explained as;**

- *Rasa – Katu, Tikta, Kashaya*
- *Guna –Laghu, Rukhsa, Tikshna*
- *Vipaka – Madhura, Katu*
- *Veerya – Ushna*
- *Karma – Vata Shamak, Shoolahara, Deepana, Pachana*

#### PROBABLE AYURVEDIC ACTION OF NAGARADI KWATH

The probable mode of action of the trial drug in concerned symptoms are:

1. The drug *Nagaradi kwath* is predominant in *Ushna virya* which pacifies the *vata dosha*, thereby reducing the *vedana* during menstruation.



2. Easy menstrual flow occurs due to *katu rasa*, *Tikshna guna*. Decrease *vedana* due to *Ushna virya* (*vata shamak*); decrease *Chardi* and *Atisara* due to *Katu* and *Tikta rasa* (*agni deepak*), decrease *aruchi* due to *Ushna virya* and *Tikta rasa* (*agni deepan*).
3. It works in *Vivandha* due to its *Kashaya rasa*, *Usna virya*.
4. According to karma, *Nagaradi kwath* is *Vata Shamaka*, *Shoolahara*, *Vatanulomana*, *Agnivardhaka*, *Deepan Pachan*.
5. It acts as *Deepana*, *Pachana*, *Ruchikara*, *Vataanuloma* quality which helps in *Amapachana*, *Agnideepana* results in mainly *rasa dhatu vridhi* which leads to increase the *upadhatu* of *rasa* i.e, *artava*. By *vata anuloman* quality it reduces the *vedana* during menstruation.
6. As *Agneya dravyas* have *ushna virya*, it maintains the normalcy of *ruksha* and *sheeta guna* of *vata*. *Agneya dravyas* are used as they are *pitta vardhaka*. By this, the *agni* will be stimulated which helps in digestion of *ama*, formation of *ahara rasa*, which later on forms the *Rasa dhatu*, from which the *artava* is formed.
7. These *Agneya dravyas* helps in increasing the quantity of *artava*, as the *artava* is also *pitta pradhana*. As the basic concept of '*sarbada sarbabhabanam samanyam vridhi karanam*', intake of *samana guna* causes the increase of same *guna*. Hence the *agneya dravyas* are given prime importance in producing *artava*, which will help in easy menstrual flow without pain.
8. Thus, *Vata anulomana*, *Shoolahara*, *Sothahara*, *Srotavisodhana* properties of *Nagaradi kwath* facilitates the normal flow of *vata* (*anuloma gati of apana vata*) thereby relieving the symptoms of *Vataja Artava Dusti*.

### PROBABLE PHARMACOLOGICAL ACTION

In Pharmacological view, the trial drug acts as an Analgesic, Antioxidant, Anti-inflammatory, Muscle relaxants actions.

- Alkaloids shows strong biological effects on human in very small doses. Alkaloids present in *Nagara* (gingerol, 8 praradol, 6-shogal, gingerone), *Pippali* (piperine), *Musta* (rotundineA1, B2, C3), *Brihati* (solanine, solanidine, solasodine), *Kantakari* (solasonine, solasodine, solamargine, betasolamargine, solanocarpine and solanocarpidine) shows anti-inflammatory, analgesic activity, smooth muscle relaxants, thus helps in painful menstruation and easy flow of menstrual blood.
- Tannins are present in *Nagara*, *Pippali*, *Musta*, *Dhavayasa*, *Brihati*, *Kantakari*, and *Patala*. Tannins are medicinally significant due to their astringent properties. They

promote rapid healing and the formation of new tissues on wounds and inflamed mucosa. It has Analgesic and anti-oxidant property thus it helps in painful menstruation.

- Glycosides present in *Musta* (rotunduside D-1, rotunduside E-2, and rotunduside F-3), *Dhanvayasa* (FagonosideA-1), *Kantakari* (diglycoside and sitosterol) and *Patala* (scutellarenin, dinatin-7-glucuronide) have laxative and analgesic property thus helps in painful menstruation. Glycosides exhibited analgesic and anti-inflammatory activities through inhibition of cyclooxygenase (COX) and lipoxygenase (LOX) pathways which are involved in the production of inflammation-mediating agent, namely prostaglandin E<sub>2</sub> (PGE<sub>2</sub>), from arachidonic acid.
- Trial drug contains Phytosterol like  $\beta$ -sitosterol in *Patala* which is chemically acts as an antioxidant, a modest radical scavenger, and physically as a stabilizer in the membranes. It helps in cellular activity and fight off free radicals that cause oxidative stress on body.
- Trial drug contains Saponins like pinatol-4 in *Dhanvayasa* which acts as an Anti-inflammatory and analgesic, thus helps in reducing pain during menstruation.
- Flavonoids in *Musta* (quercetin, kaempferol, catechin and myricetin) and *Dhanvayasa* (quercetin-7, isorhamnetin - $\alpha$  - 3-Orhamnoside -8) acts as an Antioxidant, Analgesic, Sedative. It helps in cellular activity and fight off free radicals that cause oxidative stress on body. They help in body function more efficiently while protecting it against toxins and stressor.
- Alkaloids in *Nagara* like gingerol,8 praradol,6-shogal, gingerone has potent anti emetic, carminative effect thus helps in reducing *Chardi* (vomiting) and *Aruchi* (loss of appetite).
- Flavonoids in *Musta* like quercetin, kaempferol has potent anti diarrhoeal effect thus reduce *Atisar* (Diarrhoea) in *Vataja Artava Dusti*.

After completion of the study, the statistical evaluation showed the following:

- In case of severity and intensity of pain during menstruation, out of 30 patients, 27 (90%) patients were cured, 3 (10%) patients had moderate improvement.
- Out of 30 patients affected by *Artava Varna* (Reddish or blackish menstrual blood), 30 (100%) patients were cured.
- Out of 30 patients affected by *Artava praman* (Scanty menstrual bleeding), 27 (90%) patients were cured and 3 (10%) patients showed moderate improvement in amount of bleeding.

### Results of Associated symptoms

- Out of 15 patients with *Chardi* (vomiting), 15 (100%) patient was cured.
- Out of 14 patients with *Vivandha* (constipation), 14 (100%) patients were cured.
- Out of 11 patients with *Aruchi* (Loss of appetite) 11 (100%) patients were cured.
- Out of 3 patients with *Atisar* (diarrhoea) 3(100%) patients were cured,

Present study reveals that there was highly significant improvement in pain relief in patients of *Vataja Artava Dusti*. There is also significant improvement in associated symptoms of *Artava varna*, *Artava praman*, *chardi*, *vivandha*, *Atisar* and *Aruchi* after three cycles of treatment.

### CONCLUSION

In this clinical trial "Evaluation of efficacy of *Nagaradi Kwath* in the management of *Vataja Artava Dusti*" was studied because *Nagaradi Kwath* is having *Vatahara*, *Shoolahara*, *Dipaniya* properties and also having the pharmacological properties of Analgesic, Antispasmodic and Anti emetic. After completion of the study, the statistical evaluation showed that 90% patients were cured in terms of cardinal symptoms and 100% patients were cured in terms of associated symptoms. The trial drug *Nagaradi Kwath* has shown high efficacy in reducing severity of *Vataja Artava Dusti's* symptoms without having any toxicity or adverse effect on the body.

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