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EVALUATE THE EFFICACY OF *FERULA ASAFOETIDA* RESIN ON PAIN OF *KARPPA VAYU* (PRIMARY DYSMENORRHEA)

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ABSTRACT

Dysmenorrhea is one of the most common clinical problems observed in regular practice and it is a medical condition of pain during menstruation that interferes with daily activities. Dysmenorrhea can be correlated with *Karppa vayu* in Siddha Medicine. An attempt has been made to treat the dysmenorrhea with Siddha system of medicine.

A single blind comparative clinical study was conducted to evaluate the efficacy of *Ferula asafoetida* resin powder on *Karppa vayu* (Primary dysmenorrhea) in comparison with standard drug (mefenamic acid).

Forty patients with *Karppa vayu* disease were selected systematically. The Selected patients were divided into 4 groups of 10 each. The groups A and B were treated with *Ferula asafetida* resin powder, orally, thrice a day 650mg and 500mg respectively with the onset of pain, for 3 continuous menstrual cycles. The group C and D were treated by standard drug of 500mg of mefenamic acid, orally, thrice a day from onset of pain for 3 continuous menstrual cycles.

Encouraging results were observed with the trial drug and when comparing *Ferula asafetida* resin powder and mefenamic acid for severe pain, the 650mg of *Ferula asafetida* resin power and 500mg of mefenamic acid both are statistically significant relief the pain because the P values <0.005. The P-value of 650mg of *Ferula asafetida* resin powder and 500mg of mefenamic acid was 0.000 and 0.001, respectively.

When comparing *Ferula asafetida* resin powder and mefenamic acid for moderate pain, the 500mg of *Ferula asafetida* resin powder and 500mg of mefenamic acid both are statistically significant relief the pain because of the P-value <0.005. The p-value of both groups is 0.000.

In the present study, *Ferula asafetida* resin powder can be used as a highly effective internal administrative medicine for *Karppa vayu.*

Key Words: Dysmenorrhea, *Ferula asafetida, Karppa vayu*, Severe pain, Siddha Medicine.

1. INTRODUCTION

1.1. Background & Justification

This is the single blind comparative clinical study conducted to determine the efficacy of internal administration of *Ferula asafetida Chooranam* in the management of *Karppa Vayu.*

Sri Lanka has an eminent wealth of therapeutic agents for various ailments and disease in our indigenous system of medicine. Numerous sorts of disease have been treated with herbal medicine throughout the history of mankind. Major formulation is used in Siddha systems are based on herbs. The medicinal herbs are used as decoctions, infusion, powders, and tinctures (1). The therapeutic value of medicinal plants depends upon the presence of one or more constituents possessing certain pharmacological and physiological activity (2). Siddha system of Medicine is one of the most primitive medical systems and also oldest medical systems of India existed from early times. The system has flourished well in India for many centuries. Although this system has declined in later years, in the wake of changing mode of life and modern medicine, it continues to sustain its influence on the masses because of its incomparable intrinsic merits. Siddha Medicine can combat all types of diseases, especially the chronic diseases, which baffles and eludes even the modern sophisticated medicine (3)

Karppa Vayu is the term which is being used for the condition where women may suffer with pain during menstruation that is mentioned in literature of Siddha Medicine. Symptoms and sign of *Karppa vayu* can be correlated with the symptoms and sign of Dysmenorrhea in Modern Medicine (4).

Dysmenorrhea is of two types out of which primary dysmenorrhea is characterized by cramps or spasmodic pain in supra pubic pain that begins somewhere between several hours before and a few hours after the onset of the menstrual bleeding. Symptoms peak with maximum blood flow and usually last less than one day, but the pain may persist up to 2 to 3 days. The pain is characteristically colicky and located in midline of the lower abdomen but may also be described as dull and may extend to lower quadrants, the lumber area, and the thigh (5).

The Ferula genus from the Umbelliferae family has been found to be rich sources of bioactive natural products. The oleo-gum-resin of *Ferulaassa-foetida* L. (asafetida) extracted from the incisions on the stem and roots of this plant are considered as an important substance of pharmacological and industrial application. The oleo-gum-resin extracted from *Ferula ass-foetida* contains about 40-64% resin, 25% endogenous gum, 10-17% volatile oil and 1.5-10% ash. Its resin fraction consists of ferulic acid esters, free feruli acid, umbelliferone and coumarin derivatives such as foetidin and kamolonol, farnesiferoles A, B, and C. The compositions of its gum fraction are known to be glucose, galactose, L-arabinose, rhamnose and gluronic acid (6).

There is currently a large and even expanding global population that prefers to use natural product in treating and preventing medical problems because herbal plants were proved to have rich resource with medicinal properties. *Ferula asafetida* is the herb mentioned in the siddha text *Gunapadam* (7) used to treat painful menstruation.

In different culture, asafetida has been used for treatment of various disorders. In Iranian folk medicine, asafetida is used as an antispasmodic, anthelminthic, carminative and analgesic agent. Asafetida is used by Americans as a powerful anthelminthic and antispasmodic but in China, asafetida is used for treatment of intestinal parasites and Fijian people take water extract of dried gum for the treatment of stomach upset. In recent studies, several pharmacological and biological

activates of asafetida have also investigated and have shown this oleo gum resin has antioxidant, antiviral, antifungal, cancer chemo preventive, anti-diabetic, antispasmodic, hypotensive and molluscicidal effects (6).

But as per the citation mentioned by Murugesamudaliyar (2013), the resin of *Ferula asafetida* plant the can be used for Dysmenorrhea, but it has not been clinically proven yet. Dysmenorrhea is a common problem in female. Now a day's people use natural products in treating disease. So based on Siddha citation, clinically proven herbal based drug with proper scientific knowledge will help to develop the Siddha system of medicine. In this study an attempt has been made to evaluate the efficacy of a purely single herb of *Ferula asafetida.* This has an antispasmodic action. The antispasmodic action could be used for managing Dysmenorrhea.

1.2. OBJECTIVES

General objective
To determine the efficacy of the ***Ferula asafetida*** resin powder on *Karppavayu* (Dysmenorrhea).

Specific objective
To compare the effectiveness between the standard drug (Mefenamic acid) and test drug (***Ferula asafetida*** resin powder).

i. Comparison between 500 mg of standard drug and 650 mg of test drug.
ii. Comparison between 500mg of standard drug and 500mg of test drug.

2. MATERIALS & METHODS

This is the single blind comparative clinical study on *Karpp Vayu* patients, according to the inclusive criteria and exclusive criteria. Patients were selected from the OPD of divisional Siddha Ayurvedic Hospital Kopalapuram, Nilaveli. The selected patients were treated with *Ferula asafetida* resin powder for 3 months. This study was conducted from 01.01.2019 – 30.03.2019.

2.1. Sample size

Sample size was calculated based on the 10 % of last year study population. According to the hospital records there were 400 patients who suffering from Dysmenorrhea were obtained treatment. Hence sample size was determined as 40.

2.2. Study design

This is the single blind comparative clinical trial.
The study design is shown in Figure. 1.

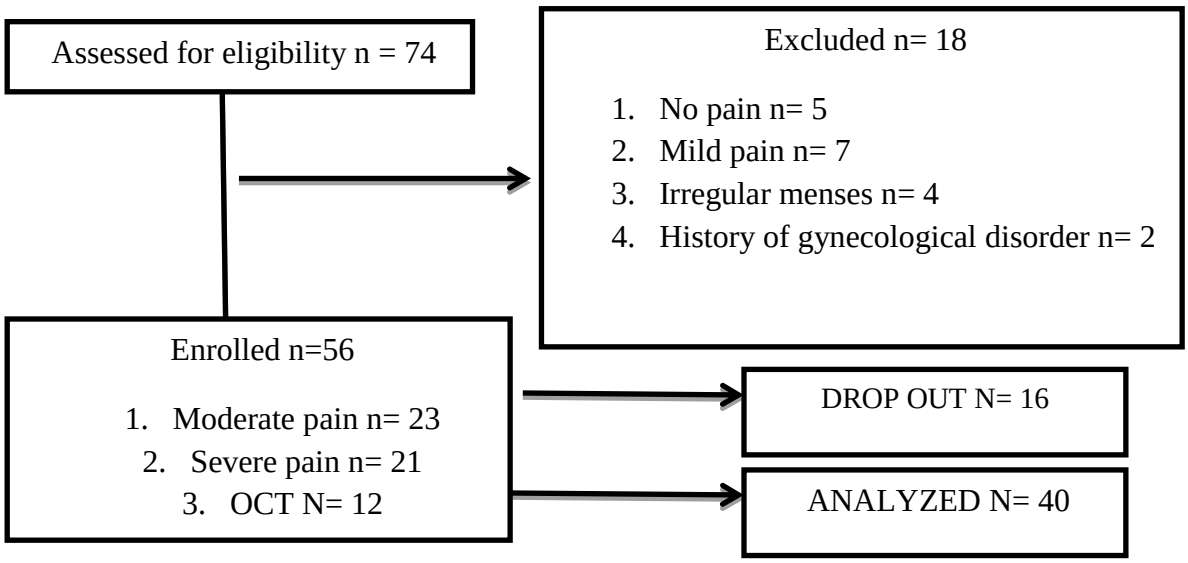

Figure 1.1: Enrolment of patients

2.3. Selection of *Karppavayu* (Dysmenorrhea) patients

400 patients were examined by the researcher for **Dysmenorrhea** at the Siddha Ayurvedic Hospital Kopalapuram, Nilaveli. Out of them a sample of 40 (10% of the patient population calculated from the available records in previous year) were selected for this study using systematic sampling method. One of the first ten patients was randomly selected for this study (The random selection happened to be the first patient). Thereafter every tenth patient was incorporated into the study. The patients were divided into four groups in the ratio of 1:1:1:1. These patients were subjected to a detailed clinical examination based on proforma specially prepared for this study. Diagnosis was made on the basis of the history and physical examination.

2.4. Inclusion criteria

1. Patients with chief complaint of lower abdomen pain during menstruation with regular cycle.
2. Age group between 20 – 30years.
3. Patients suffering for more than 12 menstrual cycles.
4. Patients who require analgesic (eg- Mefanamic acid, Naproxen, Ibuprofen) for pain relief.
5. Not satisfied with ongoing analgesic drugs

2.5. Exclusion criteria

1. Patients not willing for trial.
2. Patient below 20years and above 30 years.
3. Patients with chronic general illness.
4. Patients having problem of Menorrhagia and anatomic or uterine pathology - Ovarian cysts, Fibroids and adenomyosis.

5. Patients with known contra indication to any of the investigational products and medicinal plants.

2.6. Withdrawals

Patients could withdraw voluntarily or at the discretion of the researcher. Patients were not replaced and the new patients were enrolled in the next consecutive number. Efforts were made in each case to identify the reason for a failed follow-up visit and/or withdrawal.

2.7. Preparation of drug

Five hundred gram of *Ferula asafetida* resin was collected from private medical shop in Jaffna. That was fried in cow's ghee and made it as a powder by using motor. Then the prepared powder was weighed and either 500mg or 650 mg filled into empty capsules.

2.8. Treatment

The selected patients (40 patients) were divided into 4 groups such as group A, B, C and D with10 for each group. The following table 1 indicates the allocation of patents and medicines.

Groups	**Intensity of pain**	**Drug**	**Dose**
Group A	Severe	*Ferula asafetida* resin powder	650mg
Group B	Moderate	*Ferula asafetida*resin powder	500mg
Group C	Moderate	Mefenamic acid	500mg
Group D	Severe	Mefenamic acid	500 mg

Table 2.1: Allocation of patients into the groups and treatment schedule

2.9. **Adverse effects**

Patients were specifically questioned as per a predetermined list of common symptoms as drowsiness, warmth, flatulence, vomiting, nausea, headache, prolong sleep time, pruritus, heart burn, mental changes, skin rash, tremor, blood in urine and oliguria based on researcher's experiences in clinical practice and mentioned in literatures. Patients were also encouraged to volunteer information that they considered to be adverse events (AE) or a side effect (SE). The researcher recorded opinions on the causality/relevance of AE/SE in each case.

2.10. Assessment criteria

The Clinical evaluation assessed by subjective and objective parameters, before and after treatment. The parameters are abdominal pain, physical activity, change in mood and patients impression about treatment.

The following scales were used for the estimation of the severity of disease and to record the clinical outcome.

1. The intensity of pain was measured by Visual analogue scale.

Visual numerical scale (VAS)

VAS is a measure of pain intensity. There could be variation in verbal descriptor anchors depending on intended use of the scale. For pain intensity, the scale is most commonly anchored by "no pain" (score of 0) and "pain as bad as it could be "worst imaginable pain" (score of 10). Usually, respondents asked to report current pain intensity or pain intensity in the last 24 hours.

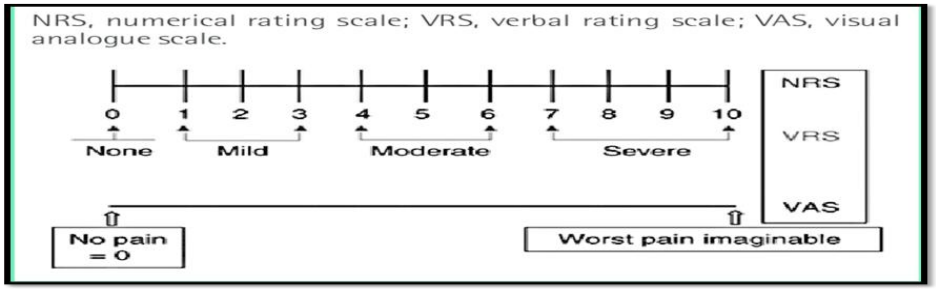

Figure 2.1: Visual numerical scale (VAS)

2. The working ability during painful menstruation measuring by verbal multidimensional scale.

Verbal multi dimensional scale (VMS)

The VMS grading system range from zero, one, two, and three for evaluating the working ability, the systemic symptoms and whether analgesia is required or not.

Grade	**Working ability**	**Systemic symptoms**	**Analgesia**
Grade 0: Menstruation is not painful and daily activity is unaffected	Unaffected	None	Not required
Grade 1: Menstruation is painful but seldom inhibits the woman's normal activity. Analgesics are seldom requiring. Mild pain.	Rarely affected	None	Rarely required
Grade 2: Daily activity affected. Analgesics required and give relief so that absence from work or campus is unusual. Moderate pain.	Moderately affected	Few	Required
Grade 3: Activity clearly inhibited. Poor effect of analgesics. Vegetative symptoms, e.g. headache, tiredness, nausea, vomiting, and diarrhea. Severe pain.	Clearly inhibited	Apparent	Poor effect

Table 2.2: Verbal multidimensional scale (VMS)

2.11. Clinical evaluation

Evaluation visits were made at baseline and first, second and third months. Effect of treatment was evaluated on the basis of changes in the signs and symptoms after the treatment. Clinical signs and symptoms, each patient was assessed on the basis of signs and symptoms of the disease. On the basis of grading pattern as well as percentage relief, patient were classified under

the five categories, such as cured, maximum improved, moderately improved, mildly changed and no improvement.

1. Cure: 100% free from the chief and associated complaints.
2. Maximum improvement: 75% to < 100% free from the chief and associated complaints.
3. Moderate improvement: 50% to < 75%free from the chief and associated complaints.
4. Mild improvement: 25% to < 50% free from the chief and associated complaints.
5. No improvement: < 25% free from the chief and associated complaints.

2.12. Instrument

The instrument used in this study is an interviewer (researcher) administrated questionnaire or proforma (Annexure I). In addition to responses to specific questions, notes were made on information obtained by examination and investigations. Pretest was done in10 patients at the Free Siddha Ayurvedic Dispensaries, Municipal Council, Jaffna.

2.13. Data analysis

The data was analyzed using the Statistical Package for Sciences (SPSS) version 20. Dependent variables and independent variables are used to evaluate the effectiveness of *Ferula asafetida* resin powder on the management of Dysmenorrhea of each variable.

3. RESULTS AND OBSERVATION

3.1. Effect of treatment on intensity of pain

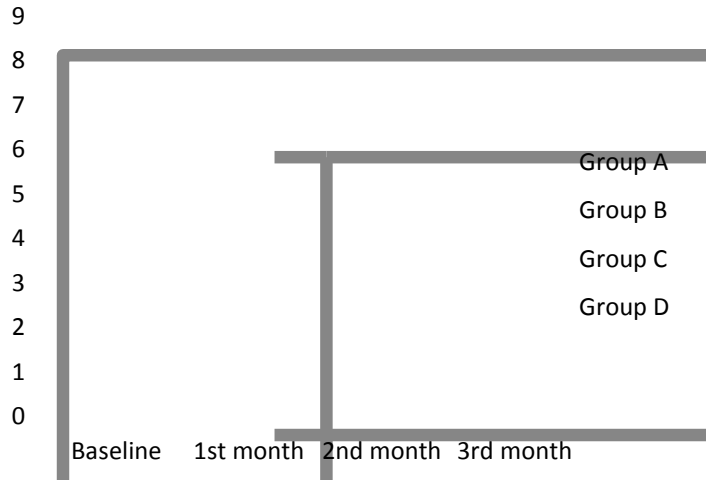

Figure 3.1: Effect of treatment on intensity of pain

In Group A – The mean score for intensity of pain before treatment was 8.10 which reduced to7.5, 6.8 and 5.7 on the 1st, 2nd and 3rd month's respectively thus reducing the pain by a mean value of0.6, 1.3 and 2.4 accordingly. The pain reduced significantly over the period of treatment compared to the pain at the commencement (figure 3.1).

In Group B – The mean score before treatment was 4.90. Which reduced to 4.20, 3.7 and 3.2, on the 1st, 2nd and 3rd months respectively thus reducing the pain by a mean value of 0.7, 1.2 and 1.7

accordingly. The pain reduced significantly over the period of treatment compared to the pain at the commencement (figure 3.1).

In Group C – The mean score before treatment was 5. Which reduced to 4.5, 3.3 and 3.0, on the 1st, 2nd and 3rd months respectively thus reducing the pain by mean value of 0.5, 1.7 and 2.0 accordingly. The pain reduced significantly over the period of treatment compared to the pain at the commencement (figure 3.1).

In group D–The mean score before treatment was 7.80.which reduced to 7.70, 7.40 and 6.8, on 1st, 2nd and 3rd months respectively thus reducing the pain by a mean value of 0.1, 0.4and 1.0 accordingly. The pain reduced significantly over the period of treatment compared to the pain at the commencement (figure 3.1).

3.2. Effect of treatment on reduction in duration of pain

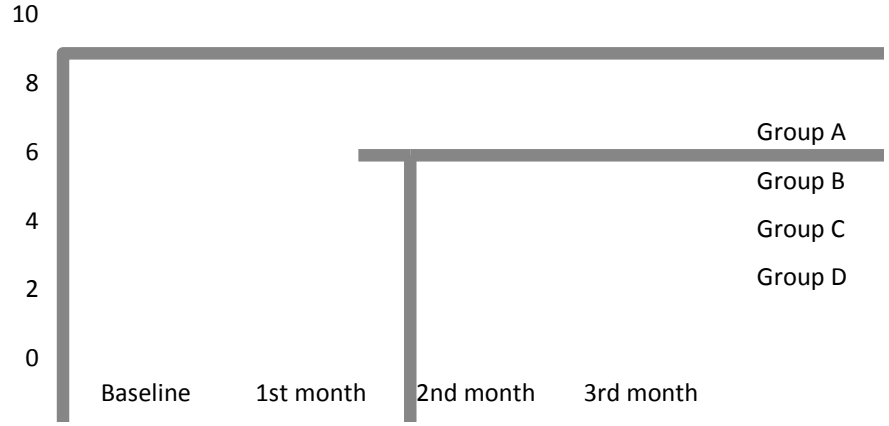

Figure 3.1: Result of significance of the difference for duration of pain

In Group A – The mean score for intensity of pain before treatment was 8.10 which reduced to7.5, 6.8 and 5.7 on the 1st, 2nd and 3rd month's respectively thus reducing the pain by a mean value of0.6, 1.3 and 2.4 accordingly. The pain reduced significantly over the period of treatment compared to the pain at the commencement (figure 3.2).

In Group B – The mean score before treatment was 4.90. Which reduced to 4.20, 3.7 and 3.2, on the 1st, 2nd and 3rd months respectively thus reducing the pain by a mean value of 0.7, 1.2 and 1.7 accordingly. The pain reduced significantly over the period of treatment compared to the pain at the commencement (figure 3.2).

In Group C – The mean score before treatment was 5. Which reduced to 4.5, 3.3 and 3.0, on the 1st, 2nd and 3rd months respectively thus reducing the pain by mean value of 0.5, 1.7 and 2.0 accordingly. The pain reduced significantly over the period of treatment compared to the pain at the commencement (figure 3.2).

In group D–The mean score before treatment was 7.80.which reduced to 7.70, 7.40 and 6.8, on 1st, 2nd and 3rd months respectively thus reducing the pain by a mean value of 0.1, 0.4and 1.0

accordingly. The pain reduced significantly over the period of treatment compared to the pain at the commencement (figure 3.2).

3.3. Effect of treatment on working ability during menstruation

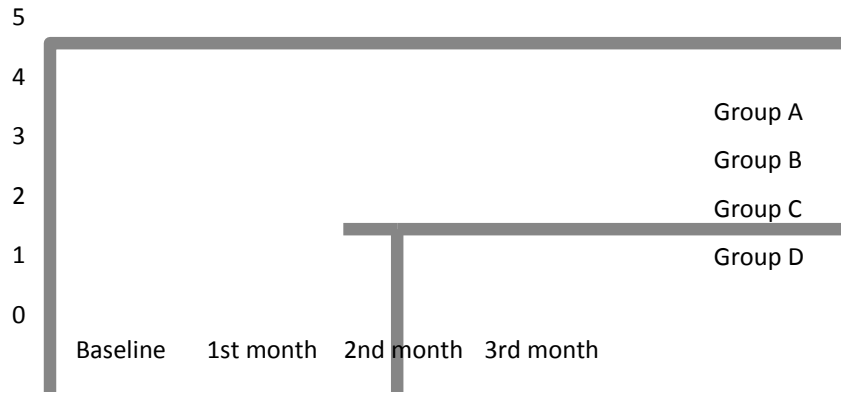

Figure 3.3: Effect of treatment on working ability during menstruation

In Group A – The mean score before treatment was 4.00 and after treatment on the1st 2nd and 3rdmonths were 3.40, 2.90 and 2.4, showing a mean difference of 0.6, 1.1 and 1.6. The p values of.048 in 1stmonth, .018 in 2ndmonths and .000 in 3rdmonth after the treatment indicate significant differences (figure 3.3).

In Group B – The mean score before treatment was 3.00 and after treatment on the 1st, 2nd and 3rdmonths were 2.90, 2.6 and 2.1, showing a mean difference of 0.1, 0.4 and 0.9. The p values of .034 in 1stmonth, .017 in 2ndmonths and .000 in 3rdmonth after treatment indicate significant differences (figure 3.3).

In Group C – The mean score before treatment was 3.00. Mean after treatment on the 1st, 2nd and 3rd months were 2.80, 2.50 and 1.90, showing a mean difference of 0.2, 0.5 and 1.1, The p values after treatment was .084 in 1stmonth, .018 in 2ndmonths and .000 in 3rdmonthafter treatment indicate significant differences (figure 3.3).

In group D – The mean score before treatment was 4.00. Mean score after treatment on the 1st, 2nd and 3rdmonths were 3.70, 3.10 and 2.70, showing a mean different of 0.3, 0.9and 1.3.The p values of .050 in 1stmonth, .009 in 2ndmonths and .000 in 3rdmonthafter treatment indicate significant differences (figure 3.3).

3.4. Comparison between test drug and standard drug for severe pain

3.4.1. Comparison between test drug and standard drug for intensity of pain

Table 3.4.1 shows paired samples T test for the difference in intensity of pain before and after treatment with test drug and standard drug during menstruation.

The results show that the intensity of pain in group A was significantly ($p < 0.005$) lowered than group D indicating that 650mg of *F. asafetida* resin powder for severe pain was more effective than 500mg of mefanamic acid.

Table 3.4.1Comparison between test drug and standard drug for intensity of pain

Group	Treatment	Mean	Std deviation	Std Error	95% Confidence Interval for Mean		Paired "t"	df	Sig (2-tailed) P
					Lower	Upper			
A	BT-AT	2.4000	0.69921	0.22111	1.89982	2.90018	10.854	9	0.000
D	BT-AT	1.1000	0.73786	0.23333	0.57216	1.62784	4.714	9	0.001

BT-AT: Before treatment – After treatment

3.4.2 Comparison between test drug and standard drug for duration of pain

Table 3.4.2 shows paired samples T test for the difference in duration of pain before and after treatment with test drug and standard drug for duration of pain during menstruation.
The results show that the difference in duration of pain in group A was significantly ($p < 0.005$) lowered than group D indicating that 650mg of *F. asafetida* resin powder for severe pain was more effective than 500mg of mefanamic acid.

Table 3.4.2 Comparison between test drug and standard drug for duration of pain

Group	Treatment	Mean	Std deviation	Std Error	95% Confidence Interval for Mean		Paired "t"	df	Sig (2-tailed) P
					Lower	Upper			
A	BT-AT	1.1000	0.31623	0.10000	0.87378	1.32622	11.000	9	0.000
D	BT-AT	1.0000	0.66667	0.21082	0.52310	1.47690	4.743	9	0.001

BT-AT: Before treatment – After treatment

3.4.3 Comparison between test drug and standard drug for working ability

Table 3.4.3 shows paired samples T test for the difference in working ability before and after treatment with test drug and standard during menstruation.
The results show that the working ability of group A subjects was significantly ($p< 0.005$) improved than group D subjects.

Table 3.4.3Comparison between test drug and standard drug for working ability

Group	Treatment	Mean	Std deviation	Std Error	95% Confidence Interval for Mean		Paired "t"	df	Sig (2-tailed) P
					Lower	Upper			
A	BT-AT	1.6000	0.51640	0.16330	1.23059	1.96941	9.798	9	0.000
D	BT-AT	1.3000	0.48305	0.15275	0.95445	1.64555	8.510	9	0.000

BT-AT: Before treatment – After treatment

3.5. Comparison between test drug and standard drug for moderate pain

3.5.1 Comparison between test drug and standard drug for intensity of pain

Table 3.5.1 shows paired samples T test for the difference in intensity of pain before and after treatment with test drug and standard drug during menstruation.

The results show that the intensity of pain group B was significantly ($p<0.005$) higher than group C indicating that 500mg of *F. asafetida* resin powder for moderate pain was not as effective as 500mg of mefenamic acid.

Table 3.5.1 Comparison between test drug and standard drug for intensity of pain

Group	Treatment	Mean	Std deviation	Std Error	95% Confidence Interval for Mean		Paired "t"	df	Sig (2-tailed) P
					Lower	Upper			
B	BT-AT	1.7000	0.82327	0.26034	1.11107	2.28893	6.530	9	0.000
C	BT-AT	2.0000	0.81650	0.25820	1.41591	2.58409	7.746	9	0.000

BT-AT: Before treatment – After treatment

3.5.2 Comparison between test drug and standard drug for duration of pain

Table 3.5.2 shows paired samples T test for the difference in duration of pain before and after treatment with test drug and standard drug during menstruation.

The results show that the intensity of pain group B was significantly ($p<0.005$) higher than group C indicating that 500mg of *F. asafetida* resin powder for moderate pain was not as effective as 500mg of mefenamic acid.

Table 3.5.2Comparison between test drug and standard drug for duration of pain

Group	Treatment	Mean	Std deviation	Std Error	95% Confidence Interval for Mean		Paired "t"	df	Sig (2-tailed) P
					Lower	Upper			
B	BT-AT	0.9000	0.31623	0.1000	0.67378	1.12622	9.000	9	0.000
C	BT-AT	1.1000	0.31623	0.1000	0.87780	1.32622	11.000	9	0.000

BT-AT: Before treatment – After treatment

3.5.3 Comparison between test drug and standard drug for working ability

Table 3.5.3 shows paired samples T test for the difference in working ability of before and after treatment with test drug and standard.

The results show that the working ability of group C subjects was significantly ($p<0.005$) improved than group B subjects indicating that 500mg of *F. asafetida* resin powder did not improve the working ability as effective as 500mg of mefanamic acid in subjects with moderate pain.

Table 3.5.3Comparison between test drug and standard drug for working ability

Group	Treatment	Mean	Std deviation	Std Error	95% Confidence Interval for Mean		Paired "t"	df	Sig (2-tailed) P
					Lower	Upper			
B	BT-AT	1.0000	0.47140	0.14907	0.66278	1.33722	6.708	9	0.000
C	BT-AT	1.3000	0.48305	0.15275	0.95445	1.64555	8.510	9	0.000

BT-AT: Before treatment – After treatment

3.6. Overall effects on parameters

In group A, the mean value for intensity of pain before administering the trial drug was 8.1 and the end of the study it was 5.7; its effectiveness is 89%. Mean value of duration of pain before and after administering the drug were 2.6, 1.6 respectively and was 88% effective on duration of pain. Mean value for working ability during menstruation, before and after administering the drug were 4.0, 2.4 respectively and drug was 82% effective on working ability.

In group B, the mean value of intensity of pain before administering the trial drug was 4.9 and end of the study was 3.2; its effectiveness is 78.5%. Mean value of duration of pain before and after administering the drug were 1.9, 1.5 respectively and was 70% effective on duration of pain. Mean value for working ability during menstruation, before and after administering the drug were 3.0, 2.1 respectively and drug was 72.2% effective on working ability.

In group C the mean value of intensity of pain before administering the standard drug was 5.0and end of the study was 3.0; its effectiveness is 85%.Mean value of duration of pain before and after administering the drug were 1.8, 1.1 respectively and was 72% effective on duration of pain. Mean value for working ability during menstruation, before and after administering the drug were 3.0, 1.9respectively and drug was 78.5% effective on working ability.

In group D the mean value of intensity of pain before administering the standard drug was 7.8 and end of the study was 6.8; its effectiveness is 80%.Mean value of duration of pain before and after administering the drug were 2.3, 1.8 respectively and was 73.9% effective on duration of pain .Mean value for working ability during menstruation, before and after administering the drug were 4.0, 2.7 respectively and drug was 75.2% effective on working ability.

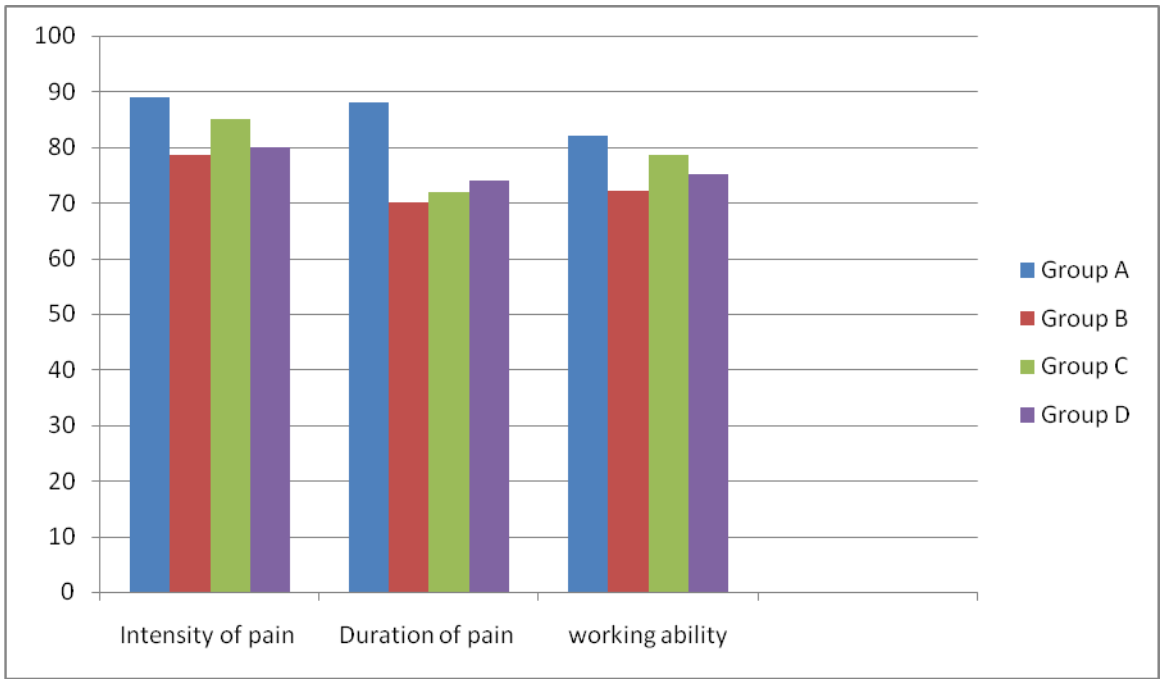

Figure 3.6: Overall effects on parameters

3.7. Overall therapeutic effect of drug

The overall result of the clinical study shows that, in the group A who were treated with 650mg of *Ferula asafetida* for severe pain. 3(30%) patient felt completely cured, 4(40%) patients felt maximum improvement and 3(30%) patients felt moderate improvement.

In the group B treated with 500mg of Ferula *asafetida* for moderate pain. 1(10%) patient felt completely cured form the pain, 4 (40%) patient felt maximum improvement, 4(40%) patients felt moderate improvement and 1(10%) patient felt mild improvement.

In the group C treated with 500mg of mefenamic acid for moderate pain. 1(10%) patient felt complete cured form the pain, 5(50%) patients felt maximum improvement and 4(40%) patients felt moderate improvement.

In the group D treated with 500mg of mefenamic acid for severe pain. That group shows 1(10%) patient felt complete cured for pain, 4 (40%) patients felt maximum improvement and 5(50%) patients felt moderate improvement.

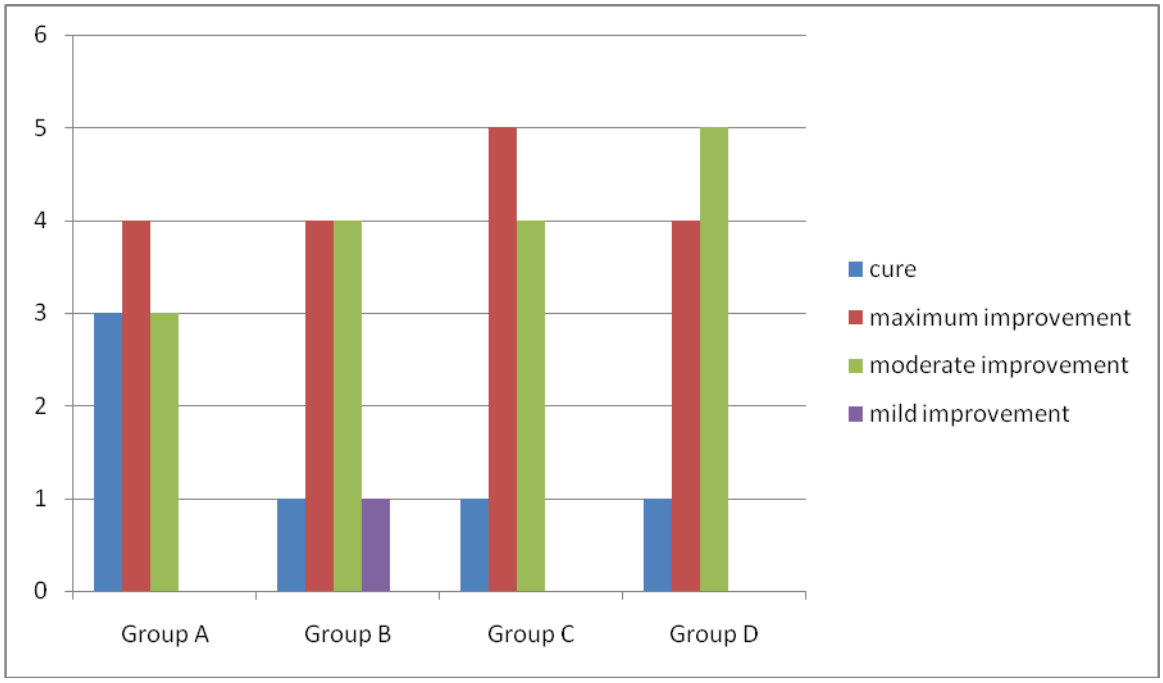

Figure 3.7: Overall therapeutic effect of drug

4. DISCUSSION

According to Siddha Medicine, *Poopu* (menstruation) is a phenomenon, which is controlled and governed by *vatham*and specifically the *Apanavay*, the sub type of the *vatha dosha*. Vitiation of *vatham*during *poopu* produces signs and symptoms of *Karppavayu*.

Paacana (carminative), is one of the therapy for treatment of *vayu* (8). The carminative action of drug is used for expulsion of gas from the stomach and intestine there by relieves pain and flatulence, (9). The *Ferula asafetida* resin powder also has the action of carminative. Which expel the excess *vayu* in *Karppavayu*.

The antispasmodic action of drug is used to relive spasm occurring in the muscles and emmenogogue action of drug that stimulates, regulates the menstrual flow and reduces the

menstrual pain, (9). *Ferula asafetida* resin powder has antispasmodic and emmenogogue actions, (7). So *Ferula asafetida* is effective for *Karppavayu*.

The Organoleptic characters of *Ferula asafetida* are: *Suwai-kaippu* (bitter taste), *Tanmai – veppam* (hot potency) and *Pirivu- kaarppu* (pungent) (7).

Milad, (2011) in a review mentioned asafetida oleo-gum-resin has been known to possess anti-inflammatory activity. Anti-inflammatory activity of asafetida helps to reduce the pain, therefore primary dysmenorrhea is relieved by *Ferula asafetida* is proved by the present study. The intensity of pain was reduces with p value from 0.015 to 0.000 with 650mg of *Ferula asafetida* resin powder and p value from 0.009 to 0.000 with500mg of *Ferula asafetida* resin powder.

Poonam Mahendra, (2012) in a review mentioned asafetida gum resin has antispasmodic activity. Antispasmolytic activity mediated through calcium channel blockade may relieve the pain by direct action on the myometrium. Antispasmodic activity of asafetida help to reduces duration of pain, therefore primary dysmenorrhea is relieved by *Ferula asafetida* is proved by the present study. The length of pain was reduces with p value from 0.018 to 0.000with 650mg of *Ferula asafetida* resin powder and p value from 0.011 to 0.000with500mg of *Ferula asafetida* resin powder.

Roghieh, (2016) in a study mentioned ferula significantly increased antioxidant gene expression. Which by free- radical scavenging enhances the immunity and general strength of the body. It increases the pain threshold and facilitates better pain tolerance capacity.

Therefore primary dysmenorrhea is relieved by *Ferula asafetida* is proved by the present study. The improvement of working ability during menstruation was increase with p value from 0.048 to 0.000 with 650mg of *Ferula asafetida* resin powder and p value from 0.034 to 0.000with500mg of *Ferula asafetida* resin powder.

When comparing of *Ferula asafetida* resin powder and mefenamic acid for severe pain, the 650mg of *Ferula asafetida* resin powder and 500mg of mefenamic acid both are Statistically significant relief the pain because the p values <0.005. The p value of 650mg of Ferula asafetida resin powder and 500mg of mefenamic acid was 0.000 and 0.001 respectively. But 650mg of *Ferula asafetida* resin powder more effective than 500mg mefanamic acid with mean value of650mg of *Ferula asafetida* resin powder and 500mg mefanamic acid was 2.4±0.699 and 1.1± 0.737 respectively.

When comparing of *Ferula asafetida* resin powder and mefanamic acid for moderate pain, the 500mg of *Ferula asafetida* resin powder and 500mg of mefanamic acid both are Statistically significant relief the pain because the p values <0.005. The p value of both group are 0.000. But 500mg of mefanamic acid more effective than 500mg of *Ferula asafetida* with mean value of 500mg of mefanamic acid and 500mg 0f *Ferula asafetida* was 2.0± 0.816 and 1.7± 0.823 respectively.

5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

On the basis of results and the findings of this study, the following conclusion can be arrived at;
1. Ferula asafetida resin powder can be used as a highly effective internal administrative medicine for *Karppavayu*.
i. 650mg 0f*Ferula asafetida* resin powder (Group A) shows significant (p=0.000) and markedly improvement on 1st month, 2nd month and 3rd month of treatment compare to 500mg of mefenamic acid (Group D).
ii. 500 mg of *Ferula asafetida* resin powder (Group B) shows significant (p=0.000) and markedly improvement on 1st month, 2nd month and 3rd month of treatment comparably less than 500 mg of mefenamic acid (Group C).
It provides the successful proof of the traditional literature about *Ferula asafetida*.

5.2 Recommendation

Ferula asafetida resin powder is a single herbal preparation even though it shows effective improvement in *Karppavayu*. This provides a base for further research especially on the phytochemical analysis.
Further research should be continuing in experimental study on *Ferula asafetida* for *Karppavayu*.

REFERENCE

1. Kapoor.L.D, (1990). Handbook of Ayurvedic Medicinal Plants. FL:CRC press.
2. Narasimhaswamy, (2010). Agasthya Siddha Literiture research Centre. India.
3. Sanmugavelu, S.P.I.M, (2010). Nooinaadal Nooimuthalnaadal Thiraddu Part-1&2. India maruthuvam homeopathy thurai. Chennai- 6001 106.
4. Sivasanmugaraja,S, (2007). Siddha MaruthuvaMagappettriyalumMagalirmaruthuvamum , Siddha ValarchchiKalakam, Jaffna.
5. Deligeoroglou, E. Dysmenorrhea. Ann. N. Y. Acad. Sci. 2000, 900, 237–244. [Google Scholar] [CrossRef] [PubMed].
6. BhagyashriPatil, Rahul Kamde,VijayBhalsing, kirtiBhati(2015), Dysmenorrhoea(Kashtartava) : An Ayurvedic Perspective. International Journal of Herbal Medicine, 3(3):33-35.
7. Murukeshamuthaliyar, (2013). Kunapaadam – Porudpanpunoolmuzlikaivakuppu. India Maruthuvam- Homiopathy Chennai.
8. VaidyaBhagwan Dash,(1980). Basic Principles Of Ayurveda. Concept Publishing Company, New delhi
9. Ramanaathan. P, (2002). Mooligaiseyalthokuppu (Action of herbs). Jaffna
10. Milad Iranshahy, Mehrdad Iranshchi, (2011). Traditional Uses, Phytochemistry and Pharmacology of Asafoetid. Journal of Ethnopharmacology 134(1), 1-10.