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A COMPERATIVE STUDY OF 'VIRECHANA KARMA' AND 'VRIDDHA DARVADHYA LOHAM' WITH 'ERAND SNEHA' IN THE MANAGEMENT OF AMAVATA W.S.R. TO RHEUMATOID ARTHRITIS – A RESEARCH ARTICLE

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ABSTRACT

Introduction: *Ayurveda* has taken the foremost place in the management of crippling disease. *Amavata*, which can be correlate with Rheumatoid arthritis due to its clinical appearance. Due to wide spectrum of disease, much prevalence and lack of effective medicine, so disease being chosen for the study. Prevalence of approx. 0.75% of the population in india. **Aims & objectives:** To Study the '*Virechana Karma'and 'Vriddha Darvadhya Loham'* with *'Erand Sneha'* in the management of *Amavata* W.S.R. to Rheumatoid Arthritis. **Methods and Material:** 20 clinically diagnosed patients of *Amavata* treated by *vriddha darvadhya loham* 2 *capsules* (each 500 mg) two times in a day with lukewarm water, for 30 days and*'Eranda snehapan'*10-20 ml with lukewarm milk according to kostha & bala of the patients at night,for 30 days in group A. And 20 clinicallly diagnosed patients of amavata treated by virechana karma followed by *vriddha darvadhya loham* 2 *capsules* (each 500 mg) two times in a day with lukewarm water, for 30 days and*'Eranda snehapan'*10-20 ml with lukewarm milk according to kostha & bala of the patients at night,for 30 days in group B. **Study Design-** Single centre and Open Clinical study. **Results:** In group A - Excellent relief was found in 0% of patients, significant relief in 10%, moderate relief in 65% whereas 25% were found mild relief, while in group B-Excellent relief was found in 5% of patients, significant relief in 35%, moderate relief in 50% whereas 10 %were found mild relief. **Conclusions:** On comparing the effect of two groups it can be concluded that Group B (*'Virechana karma & Vriddha darvadhya loham & Erand Sneha*) provided better relief than Group A (*'Vriddha darvaddhya loham & Erand sneha'*) in most of the sign and symptom of the disease at significant level.

KEYWORDS: Amavata, Rheumatoid arthritis, Vriddha darvadhya loham, Erand Sneha, Virechana karma.

INTRODUCTION

In the present time, due to modern life style, hectic schedule, stress and many such reasons, incidence of disease are increasing, one of them is *Amavata*, which can be compared with Rheumatoid Arthritis due to its clinical appearance. Due to wide spectrum of disease, much prevalence in the society and lack of effective medicine, the disease is being chosen for the study. Prevalence of approx. 0.75% of the population in India, About 80% of people developed between ages 35–50 yrs.

According to the nature of disease, it is essential to work on such therapy which has *Ama* and *Vatahara* properties. Here has tried to study the various aspects of the disease in the perspective of *Shamana* drug. The line of treatment described for the disease as "*Langhanam Swedanam Tiktham.......*" mentioned in *Chakradatta Amavatachikisa Prakarana*25/1.So, *Vriddha Darvadhya Loham'* with *'Erand Sneha'* had been selected as *Shamana* therapy.

AIMS AND OBJECTIVES

- ✓ Conceptual and clinical studies on *Amavata* w.s.r. to Rheumatoid Arthritis and its management with time examined methods and *Ayurvedic* principle.
- ✓ Clinical evaluation of the efficacy of *'Vriddha Darvadhya Loham' & 'Erand Sneha'* in management of *Amavata.*

✓ Comparison of efficacy of *'Virechana Karma' & 'Vriddha Darvadhya Loham'* with *'Erand Sneha'* in the management of *Amavata*.

MATERIALS AND METHODS

Selection of patient: A total 40 patients of *Amavata* were randomly selected for the present study, from the *Kayachikitsa* OPD and IPD of Rajasthan Ayurveda university, Jodhpur. The case selection was random regardless of sex, occupation and socio-economic conditions. Both acute and chronic phase of *Amavata* patients were taken for the study,

The main criteria of diagnosis of patients were based on the signs and symptoms of the disease based on the *Ayurvedic* and modern texts.

➤ **Study Design-** Single centre and Open Clinical study.
➤ **Inclusion criteria**
1. The patients between the age group of 18 to 65 years in either sex presenting with clinical features of *Amavata.*
2. Prediagnosed patient of *Amavata.* (chronicity < 5 years)
3. Clinically diagnosed cases of Rheumatoid Arthritis.
4. Seronegative cases of Rheumatoid Arthritis.
5. Patient willing to sign the consent forms.

➤ **Exclusion criteria**
 Following patients will be excluded from clinical trial
1. Patients of age below 18 years and above 65 years of either sex.
2. Chronicity of *Amavata* more than 5 years.
3. Patients having severe crippling deformities.
4. Patients suffering from paralysis.
5. Patients having neoplasm of spine, Gout, Ankylosing spondylysis, traumatic arthritis and pyogenic Osteomylitis etc.
6. Patients having associated Cardiac disease, Pulmonary Tuberculosis, Diabetes Mellitus, Malignant Hypertension, Renal Function Impairment, etc.
7. Patients with extremely reduced joint space.
8. Patients with bone deformity.
9. Pregnant women and lactating mother.

➤ **Grouping-** A total 40 clinically diagnosed and registered patients of *Amavata* were divided randomly into two groups. Each group had 20 patients.

Group A – 20 clinically diagnosed and registered patients of *Amavata* will be treated by *'Vriddha Darvadhya Loham' 2* **capsules each *500 mg*** two times in a day with lukewarm water, and **'*Erand Snehapan'*** 10-20 ml daily with lukewarm milk according to *Kostha & Bala* of the patients, at night, for 30 days.

Group B – 20 clinically diagnosed and registered patients of *Amavata* will be treated by **'Virechana'** as per *"Shastrokta Vidhi"* followed by treatment with *'Vriddha Darvadhya Loham' 2* capsules each 500 mg two times a day, and *'Erand Snehapan' 10-20 ml* daily with lukewarm milk according to *Kostha & Bala* of the patients, at night.

➤ **Trial Drugs**
1.Vriddha Darvadhya Loham' is mentioned in *Rasendra chintamani Amavatachikitsa prakarana* 9@4 & contents are *Vriddhadaru, Trivrita, Dantimoola, Hastikarna, Chitrakamoola, Maankanda, Amalaki, Haritaki, Vibhitaki,Pipalli, Sunthi, Maricha, Mustaka, Vayavidanaga, Chitraka* 15 contents were taken in equal amount (1 part each), while loha bhasma were taken in the ratio of 1:2 respectively.

2. '*Erand Snehapan'* is discribed in *Bhaishjyaratnavali Amavata rogadhikara* 29/13.

3. Virechana Karma is selected for study as Samshodhana therapy.

Both drugs prepared in pharmacy of the institute. (Drug Batch no. A0056).

➤ **Duration of clinical trial and follow up study.**
1. 30 days for oral drug.
2. All patients followed up fortnightly for 1 month.

➤ **Criteria for assessment**
1. **Subjective parameters-**
Pain in joint

Table 3: Assessment of pain was done by Visual Analogue Scale.

Sr. No.	Symptoms	Grading
1	No pain	00
2	Distress	01
3	Annoying	02 – 03
4	Uncomfortable	04
5	Dreadful	05 – 06
6	Horrible	08
7	Unbearable distress	09
8	Agonizing	10

1. **Stiffness in joint**

Sr. No.	Symptoms	Grading
1	No stiffness	00
2	< 15 min.	01
3	< 30 min.	02
4	< 1 hrs.	03
5	> 1 hrs	04

2. Swelling of joint

Sr. No.	Symptoms	Grading
1	No swelling	00
2	Felling of swelling	01
3	Felling of swelling + Heaviness	02
4	Apparent swelling	03
5	Huge (Synovial effusion) swelling.	04

3. Tenderness at joint

Sr. No.	Symptoms	Grading
1	No tenderness	00
2	Says tender	01
3	Patient winces	02
4	Winces and withdraws	03
5	Not allowed to be touched	04

4. Angmarda (Bodyache)

Sr. No.	Symptoms	Grading
1	No body ache	00
2	Generalized body ache of and on during the day	01
3	Generalized body ache during most part of the day not affecting any work	02
4	Generalized body ache throughout the day but person is able to do normal routine	03
5	Generalized (sarvanga) body ache/pain enough to affect routine work for all the day	04

6. *Aruchi* (Anorexia)

Sr.No.	Symptoms	Grading
1	Willing toward all *Bhojya Padarth*	00
2	Unwilling toward some specific *Ahara* but less than normal	01
3	Unwilling toward some specific rasa i.e *Katu/Amala/Madhura* food	02
4	Unwilling for food but could take the meal	03
5	Totally unwilling for meal	04

7. *Trishna* (Excessive thrist)

Sr. No	Symptoms	Grading
1	Feeling of thirst(7–9times/24hours) & relieved by drinking water	00
2	Feeling of moderate thirst (>9-11times/24hours) & relieved by drinking water.	01
3	Feeling of excess thirst (>11–13times/24hours)not relieved by drinking water.	02
4	Feeling of severe thirst(>13times) not relieved by drinking water	03

8. *Alasya* (Lazyness/Absence of enthusiasm)

Sr. No.	Symptoms	Grading
1	No *Alasya* (doing satisfactory work with proper vigor & in time)	00
2	Doing satisfactory work/late initiation, like to standing comparison to walk.	01
3	Doing unsatisfactory work/late initiation, like to sit in comparison to stand	02
4	Doing little work very slow, like to lie down in comparison to sit.	03
5	Don't want to do work/no initiation, like to sleep in comparison to lie down	04

9. *Gaurava* (Heaviness)

Sr.No.	Symptoms	Grading
1	No feeling of heaviness	00
2	Occasional feeling of heaviness	01
3	Continuous feeling of heaviness, but patient does usual work	02
4	Continuous feeling of heaviness which hampers usual work	03
5	Unable to do any work due to heaviness	04

10. *Jwara* (Fever)

Sr.No.	Symptoms	Grading
1	No fever	00
2	Occasional fever subsides by itself	01
3	Daily once subsides by itself	02
4	Daily once subsides by drug	03
5	Continuous fever	04

11. *Apaka* (Indigestion of food)

Sr. No.	Symptoms	Grading
1	No Apaka /Indigestion	00
2	Indigestion / prolongation of food digestion period occasionally related to heavy meal	01
3	*Avipaka* occurs daily after each meal takes four to six hour for *Udagara shuddhi* etc *Lakshana*	02
4	Eat only once in a day and does not have hungery by evening	03
5	Never gets hungery always feeling heaviness in abdomen	04

12. *Bahumootrata* (frequency of micturition per 24 hours)

Sr. No.	Symptoms	Grading
1	Less than 4 times/24 hrs	00
2	4 - 6 times/24 hrs.	01
3	6-10times/24hrs	02
4	> 10 times/24 hrs	03

For assessment of overall improvement, following grading used.

Sr. No.	Observation	Grading	Percentage
1.	No relief	0	0%
2.	Mild relief	1	1-25%
3.	Moderate relief	2	26-50%
4.	Significant relief	3	51-75%
5.	Excellent relief	4	76-100%

Objective parameters
Hb gm%, TLC, DLC, ESR, Sr.Uric acid, BSL (F),RA Factor, CRP test, ASLO titre, Urine R/M, Radiological-X-ray of appropriate joints.

In this study, Sr. Uric Acid, was used to exclude the Gouty Arthritis, BSL for screening the DM & ASL-O for screening the rheumatic arthritis.

OBSERVATION

18 patients in age group 31-40 yrs &10 patients in age group 41-50 yrs were found; it shows overall 50% patients belong to 3rd to 5th decade of life. Incidence of disease is found notably higher in females (88.88%) than in males (11.11%). This suggests that the incidence of *Amavata* is more common in females than males.

Majority of the patients (80%), belonged Hindu religion; 91.11% patients were married. Out of which, maximum 66.66% patients were housewives followed by 13.33% labors, about 55.55% patients belong to poor class. Max. 51.11% Patients of *Vata-Kaphaja Prakriti* which is highly associated with the development of

*Amavata,*51.11% patients were of *Madhyama Sara*, 60% were having *Madhyama Samhanan*, 64.44% patients with *Madhyama Satmya*, 48.89% patients with *Madhyama Satva*, 48.89% patients showed *Madhyama Ahara Shakti,*60% patients showed *Madhayama Vyayama shakti,* 55.56% patients showed *Madhyama* nature of *Koshtha,* maximum 64.44% patients were of *Mangagni.* In this type of *Agni* there is predominance *Kapha Dosha,* which may play important role in developing the pathogenesis of *Amavata.* Maximum patients 97.78% were addicted to Tea, maximum 53.33% patients were found with duration of illness of 2-4 years, 73.33% patients had positive drug history of Allopathic &Ayurvedic medicines. Maximum patients had *Atiguru Ahara*82.22% forward by *Singdha Ahara*& *Vishamashana* 68.89% each, *Adhyashana* in58.78%, *Ati Madhura* & *Atidrava Ahara* in51.11% each, 46.67% had the habit of *Viruddha* and 15.55% had the habit of *Ruksha Ahara*, *Divasvapna* in84.44%, *Nishchalata* in75.55%, *Bhojanottara Vyayama* in68.89%, *Ratri Jagarana* in 60%, *Vishama Shayya* in 35.55%, *Chinta* in37.78%, *Bhaya* in 15.55%, *Shoka* in8.89% as *Nidana* of *Amavata.*

8.89% patients had positive family history of the disease, maximum 46.67% patients had CRP positive test &22.22% patients had RA factor positive test before the treatment. 100% patients had pain in joint, stiffness of joint, swelling of joint and *Angamarda* each, 93.33% patients hadTenderness at joint& *Apaka,* 91.11%patients had *Jwara*; 88.89% patients had *Aruchi,* 77.78% patients had *Bahumutrata* &*Gaurava* each*,* 73.33% patients had complaint of*Alasya,* 53.33% patients had complaint of *Trishna*before the treatment*.* Maximum 93.33% patients had Metacarpophalageal (hand) joint involvement, 88.88% had Proximal interphalangeal (hand), 86.66% had distal interphalengeal (hand) joint, 80% had wrist joint, 75.55% had elbow joint, 51.11% had shoulder joint, 64.44% had ankle joint, 51.11% had knee joint involvement, 77.77% had Metatarsophalengeal and 17.77 % had patients had the temporomandibular joint involvement.

RESULTS

17 patients in age group 31-40 yrs & 11 patients in age group 41-50 yrs were found; it shows overall 50% patients belong to 3rd to 5th decade of life. Incidence of disease is found notably higher in females (77.50%) than in males (22.50%). This suggests that the incidence of *Amavata* is more common in females than males.

Majority of the patients (77.50%), belonged Hindu religion; 87% patients were married. Out of which, maximum 60% patients were housewives followed by 15% labors, about 45% patients belong to poor class. Max. 47.50% Patients of *Vata-Kaphaja Prakriti* which is highly associated with the development of *Amavata,*52.50% patients were of *Madhyama Sara*, 52.50% were having *Madhyama Samhanan*, 55.00% patients with *Madhyama Satmya*, 55.00% patients with

Madhyama Satva, 45.00% patients showed *Madhyama Ahara Shakti,* 62.50% patients showed *Madhayama Vyayama shakti,* 45.00% patients showed *Madhyama* nature of *Koshtha,* maximum 72.50% patients were of *Mandagni.* In this type of *Agni* there is predominance *Kapha Dosha,* which may play important role in developing the pathogenesis of *Amavata.* Maximum patients 92.50% were addicted to Tea, maximum 47.50% patients were found with duration of illness of 2-4 years, 60.00% patients had positive drug history of Allopathic & *Ayurvedic* medicines. Maximum patients had habbit of *Atidrava Ahara* 62.50% forward by *Addhyashana in* 57.50% & *Atimadhura & Vishamashana* 52.50% each, *Snigdha in* 47.50%, followed by *Virruddhha & Atiguru* 42.50 % each, 37.50 % had the habbit of Ruksha Ahara, 72.50 % had the habbit of Diwaswapana, 67.50 % had Shoka, 65% had Chinta, 60 %had Ratrijagarana, 52.50 % Nishchalata, 50 % had Vishama shaya, 47.50% had Ativyayama, & 40 % patients had in the habit of Bhaya as *Nidana* of *Amavata.*

22.50% patients had positive family history of the disease, maximum 57.50% patients had CRP positive test & 42.50% patients had RA factor positive test before the treatment.100% patients had complaint of Pain in joint, Stiffnessof joint, Swelling over joints, &*Angamarda,* 97.50% patients had complaint of Tenderness at joint, 92.50% patients had complaint of *Aruchi,* 82.50% patients had complaint of *Jwara,* 77.50% patients of complain of*Apaka, 75.00% patients had complaint Alasya* 72.50% patients had complaint of *Aruchi,* 67.50% patients had complaint of *Gaurav, & 65.00 %* patients had complaint of *Bahumutrata* before the treatment. Maximum 87.50% patients were had wrist (hand) joint involvement, 82.50% distal interphalangeal (hand), 82.50% metacarpophalageal (hand) joint, 72.50% distal interphalageal(LL), 70.00% shoulder joint, 67.50% proximal interphalageal (LL), 62.50% proximal interphalageal (UL), 52.50% elbow involvement, 42.50% metacarpophalageal (LL) involvement, 17.50% knee involvement and 12.50% temoromendibular, 5.00% spine involvement in patients were had the temporomandibular joint involvement.

Effect of Therapy on Cardinal Sign and Symptoms Intra Group comparisonin Subjective Parameters

Table 1: Showing Effect of Therapy in Subjective Parameters. (Wilcoxon matched-pairs signed ranks test).

Variable	Gr.	Mean BT	Mean AT	MeanDiff.	% Relief	SD±	SE±	P	S
Pain in joint	Gr. A	6.15	3.60	2.55	41.46	2.874	0.6427	0.0042	VS
	Gr. B	7.05	3.65	3.40	48.22	1.392	0.3112	<0.0001	ES
Stiffness of joint	Gr. A	3.60	2.75	0.85	23.61	0.9881	0.2209	0.0026	VS
	Gr. B	3.15	1.70	1.45	46.03	0.7592	0.1698	<0.0001	ES
Swelling of joint	Gr. A	2.55	1.80	0.75	29.41	0.9665	0.2161	0.0052	VS
	Gr. B	2.55	1.05	1.50	58.82	0.7609	0.1701	<0.0001	ES
Tenderness at joint	Gr. A	1.95	1.40	0.55	28.20	0.9445	0.2112	0.0295	S
	Gr. B	2.10	1.45	0.65	30.95	0.8127	0.1817	0.0067	VS
Angamarda	Gr. A	2.95	2.30	0.65	22.03	0.8127	0.1817	0.0090	VS
	Gr. B	3.00	1.25	1.75	58.33	1.118	0.2500	<0.0001	ES
Aruchi	Gr. A	2.15	1.55	0.60	27.90	0.8826	0.1974	0.0134	S
	Gr. B	1.95	1.35	0.60	30.76	0.8208	0.1835	0.0107	S
Trishna	Gr. A	1.95	1.65	0.30	15.38	0.6569	0.1469	0.1055	NS
	Gr. B	1.65	1.50	0.15	9.09	0.6708	0.1500	0.4258	NS
Alasya	Gr. A	2.25	1.40	0.85	37.77	0.8751	0.1957	0.0017	VS
	Gr. B	2.35	1.35	1.00	42.55	0.7255	0.1622	0.0001	ES
Gaurava	Gr. A	2.30	1.70	0.60	26.08	0.8208	0.1835	0.0129	S
	Gr. B	2.45	1.05	1.40	57.14	0.6806	0.1522	<0.0001	ES
Jwara	Gr. A	1.25	0.95	0.30	24.00	0.5712	0.1277	0.0547	NS
	Gr. B	1.40	1.05	0.35	25.00	0.8127	0.1817	0.1099	NS
Apaka	Gr. A	1.30	0.85	0.45	34.61	0.6048	0.1352	0.0137	S
	Gr. B	1.85	1.05	0.80	43.24	0.8335	0.1864	0.0012	VS
Bahu-mutrata	Gr. A	2.10	1.85	0.25	11.90	0.5501	0.1230	0.1094	NS
	Gr. B	2.35	1.80	0.55	23.40	0.9987	0.2233	0.0327	S

(Gr.: Group, BT: Before treatment, AT: After treatment, Diff.: Difference, SD.: Standard Deviation, SE: Standard Error, P: P value, ES: Extreme Significant, VS: Very Significant, S: Significant, NS: Non Significant)

Effect of Therapy onPain in Joint Score in Two Groups

★ In Group A the mean Score before treatment was 6.15 which lowered down to 3.60 after treatment, with SD±2.874giving a relief of 41.46 % which was statistically very significant (P <0.01)).

★ In Group B the mean Score before treatment was 7.05 which lowered down to 3.65 after treatment, with SD±1.392 giving a relief of 48.22 % which was statistically extreme significant (P<0.0001).

Effect of Therapy on Stiffness of joints Score in Two Groups
★ In Group A the mean Score before treatment was 3.60 which lowered down to 2.75 after treatment, with SD±0.9881 giving a relief of 23.61% which was statistically very significant (P<0.01).
★ In Group B the mean Score before treatment was 3.15which lowered down to 1.70 after treatment, with SD±0.7592 giving a relief of 46.03 % which was statistically very significant (P<0.01).

Effect of Therapy on Swelling of joint Score in Two Groups
★ In Group A the mean Score before treatment was 2.55 which lowered down to 1.80 after treatment, with SD±0.9665 giving a relief of 29.41 % which was statistically very significant (P<0.01).
★ In Group B the mean Score before treatment was 2.55 which lowered down to 1.05 after treatment, with SD±0.7609 giving a relief of 58.82 % which was statistically extreme significant (P<0.0001).

Effect of Therapy on Tenderness at joint Score in Two Groups
★ In Group A the mean Score before treatment was 1.95 which lowered down to 1.40 after treatment, with SD±0.9445 giving a relief of 28.20 % which was statistically significant (P<0.05).
★ In Group B the mean Score before treatment was 2.10 which lowered down to 1.45after treatment, with SD±0.8127 giving a relief of 30.95 % which was statistically very significant (P<0.01).

Effect of Therapy on *Angamarda* Score in Two Groups
★ In Group A the mean Score before treatment was 2.95 which lowered down to 2.30after treatment, with SD±0.8127 giving a relief of 22.03 % which was statistically very significant (P<0.01).
★ In Group B the mean Score before treatment was 3.00 which lowered down to 1.25 after treatment, with SD±1.118giving a relief of 58.33 % which was statistically extreme significant (P<0.0001).

Effect of Therapy on *Aruchi* Score in Two Groups:
★ In Group A the mean Score before treatment was 2.15 which lowered down to 1.55 after treatment, with SD±0.8826 giving a relief of 27.80 % which was statistically significant (P<0.05).
★ In Group B the mean Score before treatment was 1.95 which lowered down to 1.35 after treatment, with SD±0.8208 giving a relief of 30.76 % which was statistically significant (P<0.05).

Effect of Therapy on *Trishna* Score in Two Groups
★ In Group A the mean Score before treatment was 1.95 which lowered down to 1.65 after treatment, with SD±0.6569 giving a relief of 15.38 % which was statistically non-significant (P>0.05).
★ In Group B the mean Score before treatment was 1.65 which lowered down to 1.50 after treatment, with SD±0.6708 giving a relief of 9.09 % which was statistically non-significant (P>0.05).

Effect of Therapy on *Alasya* Score in Two Groups
★ In Group A the mean Score before treatment was 2.25which lowered down to 1.40 after treatment, with SD±0.8751 giving a relief of 37.77% which was statistically very significant(P<0.01).
★ In Group B the mean Score before treatment was 2.35 which lowered down to 1.35 after treatment, with SD±0.7255 giving a relief of 42.55 % which was statistically extreme significant (P<0.0001).

Effect of Therapy on *Gaurava* Score in Two Groups
★ In Group A the mean Score before treatment was 2.30 which lowered down to 1.70 after treatment, with SD±0.8208 giving a relief of 26.08 % which was statistically significant (P<0.05)
★ In Group B the mean Score before treatment was 2.45 which lowered down to 1.05 after treatment, with SD±0.6806 giving a relief of 57.14 % which was statistically extreme significant (P<0.0001).

Effect of Therapy on *Jwara* Score in Two Groups
★ In Group A the mean Score before treatment was 1.25 which lowered down to 0.95 after treatment, with SD±0.5712 giving a relief of 24.00% which was statistically non-significant (P>0.05).
★ In Group B the mean Score before treatment was 1.40 which lowered down to 1.05 after treatment, with SD±0.8127 giving a relief of 25.00 % which was statistically non-significant (P>0.05).

Effect of Therapy on *Apaka* Score in Two Groups
★ In Group A the mean Score before treatment was 1.30 which lowered down to 0.85 after treatment, with SD±0.6048 giving a relief of 34.61% which was statistically significant (P<0.05).
★ In Group B the mean Score before treatment was 1.85 which lowered down to 1.05 after treatment, with SD±0.8335 giving a relief of 43.24 % which was statistically very significant (P<0.01).

Effect of Therapy on *Bahumutrata* Score in Two Groups
★ In Group A the mean Score before treatment was 2.10 which lowered down to 1.85 after treatment, with SD±0.5501 giving a relief of 11.90 % which was statistically non-significant (P>0.05).
★ In Group B the mean Score before treatment was 2.35 which lowered down to 1.80 after treatment, with SD±0.9987 giving a relief of 23.40 % which was statistically significant (P<0.05).

Inter group comparisons-Showing Effect of Therapy in Subjective Parameters

Table 2: Intergroup Comparison of Group A & Group B for Subjective Parameters: (Mann-Whitney Test).

Variable	Groups	(AT) Mean	SD±	SE±	P	S
Pain in joint	A	2.55	2.874	0.6427	0.6680	NS
	B	3.40	1.392	0.3112		
Stiffness of joint	A	0.85	0.9881	0.2209	0.0604	NS
	B	1.45	0.759	0.1698		
Swelling of joint	A	0.75	0.9665	0.2161	0.0152	S
	B	1.50	0.7609	0.1701		
Tenderness at joint	A	0.55	0.9445	0.2112	0.7168	NS
	B	0.65	0.8127	0.1817		
Angamarda	A	0.65	0.8127	0.1817	0.0019	VS
	B	1.75	1.118	0.2500		
Aruchi	A	0.60	0.8826	0.1974	0.9653	NS
	B	0.60	0.8208	0.1835		
Trishna	A	0.30	0.6569	0.1469	0.4803	NS
	B	0.15	0.6708	0.1500		
Alasya	A	0.85	0.8751	0.1957	0.6228	NS
	B	1.00	0.7255	0.1622		
Gaurava	A	0.60	0.8208	0.1835	0.0026	VS
	B	1.40	0.6806	0.1522		
Jwara	A	0.30	0.5712	0.1277	0.7883	NS
	B	0.35	0.8127	0.1817		
Apaka	A	0.45	0.6048	0.1352	0.1565	NS
	B	0.80	0.8335	0.1864		
Bahumutrata	A	0.25	0.5501	0.1230	0.2967	NS
	B	0.55	0.9987	0.2233		

(P: P value, HS: Highly Significant, VS: Very Significant, S: Significant, NS: Non Significant)

After this statistical analysis of inter group comparison we got that Angamarda & Gaurava have shown very significant, while Swelling at joints has shown significant changes & Pain in joint, Stiffness in joint, Tenderness at joint, _Aruchi, Trishna, Jwara, Apaka, Alasya & Bahumutrata_ have shown non significant difference between the groups.

Table 3: Showing the % Relief in Both the Groups in Subjective parameters.

Subjective parameters	% Relief in Group A	% Relief in Group B
Pain in Joint	41.46%	48.22%
Stiffness in joint	23.61%	46.03%
Swelling of Joint	29.41%	58.82%
Tenderness at Joint	28.20%	30.95%
Angamarda	22.03%	58.33%
Aruchi	27.90%	30.76%
Trishna	15.38%	9.09%
Alasya	37.77%	42.55%
Gaurava	26.08%	57.14%
Jwara	24.00%	25.00%
Apaka	34.61%	43.24%
Bahumutrata	11.90%	23.40%
Total	322.35 %	473.53%

Intra group comparisons- Showing Effect of Therapy in Objective Parameters. (Paired 't' Test)

Table 4: Showing effect of Therapy on Objectives parameter (Lab Inv.).

Variable	Group	Mean		Mean Diff.	% Relief	SD±	SE±	T	P	S
		BT	AT							
Hb%	Gr. A	11.55	11.96	-0.410	-3.54	0.462	0.103	3.968	0.0008	ES
(gm %)	Gr. B	11.85	12.33	-0.475	-4.006	0.984	0.220	2.159	0.0439	S
TLC	Gr. A	7135	6070	1065	14.92	1360.4	304.21	3.501	0.0024	VS
	Gr. B	7485	7395	90.00	11.20	1176.5	263.07	0.3421	0.7360	NS
ESR	Gr. A	39.05	22.50	16.55	42.38	11.596	2.593	6.303	<0.0001	HS
	Gr. B	36.15	19.70	16.45	45.50	15.813	3.536	4.652	0.0002	ES

(**Hb-**Haemoglobin**; TLC-**Total Leucocytes Count; **ESR-**Erythrocyte Sedimentation Rate, Gr.: Group, BT: Before treatment, AT: After treatment, Diff.: Difference, SD.: Standard Deviation, SE: Standard Error, P: P value, HS: Highly Significant, ES: Extreme significant VS: Very significant S: Significant, NS: Non Significant)

Effect of Therapy on Hb% Score in Two Groups
★ In Group A the mean Score before treatment was 11.55 which growed upto 11.96 after treatment, with SD±0.4621 giving an improvement of 3.54 % which was statistically extreme significant (P<0.0001).
★ In Group B the mean Score before treatment was 11.85 which growedupto12.33 after treatment, with SD±0.9840 giving an improvement of 4.00 % which was statistically significant (P<0.05).

Effect of Therapy on TLC Score in Two Groups
★ In Group A the mean Score before treatment was 7135 which lowered down to 6070 after treatment, with SD±1360.4 giving an improvement of 14.92 % which was statistically very significant (P<0.01).
★ In Group B the mean Score before treatment was 7485 which lowered down to 7395 after treatment, with SD±1176.5 giving an improvement of 1.20 % which was statistically non-significant (P>0.05).

Effect of Therapy on ESR Score in Two Groups
★ In Group A the mean Score before treatment was 39.05 which lowered down to 22.50 after treatment, with SD±11.596 giving (percentage of decreased) an improvement of 42.38 % which was statistically highly significant (P<0.0001).
★ In Group B the mean Score before treatment was 36.15 which lowered down to 19.70 after treatment, with SD±15.813 giving (percentage of decreased) an improvement of 45.50 % which was statistically extreme significant (P<0.001).

Table 5: Showing Effect of Therapy in Objective Parameters (Paired t - Test).

Varia-ble	Gr.	Mean		Mean Diff.	% Relief	SD±	SE±	T	P	S
		BT	AT							
CRP	Gr. A	0.4000	0.2000	0.2000	50.00	0.523	0.1170	1.710	0.1036	NS
	Gr. B	0.6500	0.2000	0.4500	69.23	0.510	0.1141	3.943	0.0009	ES
R.A Factor	Gr. A	0.2000	0.1500	0.0500	25.00	0.394	0.088	0.5675	0.5770	NS
	Gr. B	0.5000	0.1500	0.3500	70.00	0.489	0.1094	3.19	0.0047	VS

Effect of Therapy on CRP Score in Two Groups
★ In Group A the mean Score before treatment was 0.4000 which lowered down to 0.2000 after treatment, with SD±0.5231 giving a relief of 50.00 % which was statistically non-significant (P>0.05).
★ In Group B the mean Score before treatment was 0.6500 which lowered down to 0.2000 after treatment, with SD±0.5104 giving a relief of 69.23 % which was statistically extreme significant (P<0.0001).

Effect of Therapy on R.A factor Score in Two Groups
★ In Group A the mean Score before treatment was 0.2000 which lowered down to 0.1500 after treatment, with SD±0.3940 giving a relief of 25.00 % which was statistically non-significant (P>0.05).
★ In Group B the mean Score before treatment was 0.5000 which lowered down to 0.1500 after treatment, with SD±0.4894 giving a relief of 70.00 % which was statistically very significant (P<0.001).

Table 6: Intergroup Comparison of Group A& Group B for Lab investigation (Unpaired t Test).

Variable	Groups	(AT) Mean	SD±	SE±	t value	P	S
Hb%	A	-0.410	0.4621	0.1033	0.2674	0.7906	NS
	B	-0.475	0.9840	0.2200			
TLC	A	1065.0	1360.4	304.61	2.424	0.0202	S
	B	90.00	1176.5	263.07			
ESR	A	16.550	11.596	2.593	0.0228	0.9819	NS
	B	16.450	15.813	3.536			
CRP	A	0.200	0.5231	0.1170	1.530	0.1344	NS
	B	0.450	0.5104	0.1141			
RA - Factor	A	0.050	0.3940	0.0881	2.135	0.0392	S
	B	0.3500	0.4894	0.1094			

(VS: Very Significant NQS: Not quite Significant NS: Non Significant)

Table 7: Showing the % Relief in Both the Groups in Lab. Investigation (Objective parameters).

Subjective parameters	% Relief in Group A	% Relief in Group B
HB %	-3.54%	-4.006%
TLC	14.92%	11.20%
ESR	42.38%	45.50%
C- RP	50.00%	69.23%
RA- Factor	25.00%	70.00%
ASLO	28.57%	40.00%
Total	%	%

Overall Effects of Therapy For assessment of overall improvement, following grading used.

Sr. No.	Observation	Grading	Percentage
1.	No relief	0	0-25%
2.	Mild relief	1	26-50%
3.	Moderate relief	2	51-75%
4.	Excellent relief	3	76-100%

Probable mode of action of Vriddha Darvadhya loham
The proposed formulation selected in this trial was chosen from Rasendra Chintamani Amavata Rogadikar 9/4 & Contents of Vriddha darvadhya loham are *Vriddhadaru, Trivritta, Dantimoola, Hastikarna, Chitrakamoola, Maankanda, Amalaki, Haritaki, Vibhitaki, Pipalli, Sunthi, Maricha, Mustaka, Vayvidanga, Chitraka & Loha bhasma* former 16 contents were taken in equal amount (1 part each).

In this combination, *Katu, Tikta* are dominant *Rasa* in formulation thus help in digestion of *Ama*& finally in breakage of pathogenesis of disease. Besides this, there is dominancy of *Laghu, Ruksha Gunas* in the **Vriddha darvadhya loham** which also helps in *Kaphaghna* property. 11 *Dravya* out of 16 in the formulation possess *Laghu Guna* & 6 *Dravya* have *Ruksha Guna*. This formulation has 10 *Dravya* with dominant *Ushna Virya* which also helps to pacify the *Vata Dosha*. 2 *Dravya* also have *Shothahara* & *2 Dravya Anulomana* properties.With these properties **Vriddha darvadhya loham** is able to digest *Ama* & control the *Vata Dosha.*

Most of the drugs have *Deepana & Pachana* properties which stimulate the *Agni* and digest the *Ama Dosha.*

Probable mode of action of *Eranda Sneha*
The proposed formulation selected in this trial was chosen from *Bhaishjyaratnavali Amavata rogadhikara* 29/13, In Bhaisjya ratnawali it is mentioned that Amavata disorder is like an elephant , which causes damage to our forest like body. Only a lion can check this menace. We can find that lion in the oil of eranda.

Eranda Taila has been given in the line of treatment of Amavata. Ricin present in the Erand taila on action of Lipase enzyme get hydrolysed to Recionelic acid which irritates bowel leading to Virechana. It is also having Vata- Kapha Shamaka properties acts on the dosha which are pathogenesis factors for the disease Amavata.

Probable mode of action of Virechaka yoga
The proposed Virechana Karma selected in this trial was chosen from *Chikitsa Sutra* of *Amavata* in *Chkradutta Amavata rogadhikara.* Ingredients of *Virechaka yoga* are *aragwadh, trivruta, haritaki, Katuka & Saindhava* in the proportion of 2:2:2:1: as per requirement. As a whole the qualities of *Virechaka yoga* can be considered as *Laghu, Ruksha, Ushna, Tikshna.* Majority of the drugs are having *Vata-Kaphashamaka* action. Owing to this property, antagonism to *Kapha* and *Ama* the *Virechana* help in significant improvement in sign and symptom of disease.

CONCLUSION
- *Amavata* is not described as a separate disease in *Brihattrayi*, first time its detailed description is available in *Madhava Nidana.*
- It can be concluded that hypo-functioning of *Agni* otherwise termed as *Mandagni* is largely responsible for the formation of *Ama* which is chief pathogenic factor of the disease.
- It is observed that symptomatology of *Amavata* very closely resembles with the disease Rheumatoid Arthritis.
- **'Vriddhha darvadhya loham '& 'Erand Sneha'** (Group A)- has provided better relief in most of the cardinal features & ESR of the disease at highly

significant level. Also better relief was observed in Pain in joint, Stiffness of joint, swelling of joint, Tenderness of joint *Angamarda, Aruchi, Alasya, Gaurava & Apaka.* Non-significant results found in *Jwara, Trishna & Bahumutrata. Very* Significant result found in TLC.

❖ **'Virechana karma & Vriddha darvadhya loham & Erand Sneha'** (Group B)- has provided better relief in most of the cardinal features and ESR of the disease at highly significant level. Also better relief was observed in Pain in joint, Stiffness of joint, swelling of joint, Tenderness of joint, *Angamarda, Aruchi, Alasya, Gaurava & Apaka.* Significant result in *Bahumutrata.* & non-significant results were found in *Jwara & Trishna* . Non-significant results were also found in TLC.

❖ On comparing the effect of two groups it can be concluded that Group B (*'Virechana karma & Vriddha darvadhya loham & Erand Sneha*) provided better relief than Group A (*'Vriddha darvaddhya loham & Erand sneha'*) in most of the sign and symptom of the disease at significant level.

❖ Although this study was conducted on small sample size with limited duration, hence any strong conclusion may be premature but it is expected that the present study will disclose some definite clues to the future researchers.

Future Recommendation for the Study
❖ In the present study the size of sample was small and period of study was limited. Hence it is difficult to draw a definite conclusion regarding this study. In this context, it is suggested that the study should be continued with large sample and treatment for longer duration.

❖ Objective parameters like CRP, ASL-O, RA Factor etc.should be measured by quantitative method i.e. titration for the better assessment of response of therapy.

❖ In further studies estimation for IgE level should be measured before and after treatment to prove its efficacy on immune system.

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