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A comparative study of *Rasona Rasnadi Ghanavati* and *Simhanada Guggulu* on *Amavata* with special reference to Rheumatoid arthritis

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Abstract

The present study was aimed to assess the clinical effectiveness of *Rasona Rasnadi Ghanavati* and *Simhanada Guggulu* along with *Rasona Rasnadi Lepa* in *Amavata*, and to compare the effect of these two therapies in the treatment. Total 101 patients of *Amavata* were registered for the present study and were randomly divided into two groups. In group A- *Rasona Rasnadi* Ghanavati 2 Vati thrice/day was given for 3 months, while in group B- *Simhanada Guggulu* 2 Vati thrice a day for 3 months was adminstered. Along with this, *Rasona Rasnadi Lepa* was applied locally over affected joints twice daily in both groups. The effects of therapy in both groups were assessed by a specially prepared proforma. The results of the study showed that both the groups showed significant relief in symptoms; however, compared to *Simhanada Guggulu*, *Rasona Rasnadi Ghanavati* showed better result in the management of *Amavata*. *Simhanada Guggulu* or *Rasona Rasnadi Ghanavati* along with *Rasona Rasnadi Lepa* can be used as an effective ayurvedic intervention in the treatment for rheumatoid arthritis.

Key words: *Ama*, *Amavata*, *Rasona Rasnadi Ghanavati*, Rheumatoid arthritis, *Simhanada Guggulu*, *Vata*

Introduction

Amavata is a chronic, degenerative disease of the connective tissue mainly involving the joints. Swelling and pain in multiple joints are the main features of *Amavata* (Rhematoid arthritis).[1,2] Constant use of incompatible food articles and strenuous exercise immediately after consumption of fatty foods leads to indigestion. This results in the formation of *Ama* which gets circulated throughout the body by *Vyana Vayu*. This then accumulates at *Shlesmasthana*, and especially at the *Shleshakakapha*, i.e., in the joints leading to the manifestation of symptoms of the disease. Body pain, loss of appetite, fever, weakness, excessive thirst and heaviness are also manifested.[3] Involvement of joints restricts the normal body movements which may lead to contracture of muscle and permanent deformities.[4] Blood investigations show a high erythrocyte sedimentation rate (E.S.R.) and positive Rheumatoid arthritis (RA) factor in 30-40% cases. Prognosis of *Amavata* is poor especially in those cases where *Tridosas* are involved.[5] The principles of treatment of *Amavata* are *Langhana* and *Swedana*; and drugs having *Tikta*, *Katu Rasa*, *Deepana*, *Virechana*, *Snehapana* and *Basti* properties.[6]

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Many Ayurvedic formulations are claimed to be effective in *Amavata*, however, scientific evidence needs to be produced. The need to establish a firm scientific basis for classical Ayurvedic formulations is now being felt. Though ample research work has been done on the disease *Amavata*, satisfactory results have not been obtained till date.

A clinical study was planned to assess the clinical effectiveness of *Rasona Rasnadi Ghanavati* and *Simhanada Guggulu* along with *Rasona Rasnadi Lepa*, and to compare the effect of these two therapies in the treatment of the condition.

In the study, in the test drug group, *Rasonadi Kwatha* and *Rasnasaptaka Kwatha*[7] have been selected for making *Rasona Rasnadi Ghanavati*. Due to its *Katu Tikta Rasa*, *Ushna Virya*, *Rasayana Prabhava*, *Amapachaka* and *Vatashamaka* properties, it helps to disrupt the *Samprapti* of *Amavata*. In the control group,

the drug of choice of *Amavata*, i.e., *Simhanada Guggulu*,[8] as it is easy to prepare and is easily available. The drugs of *Simhanada Guggulu* are having mostly *Ama* and *Vata Shamaka* property. *Lepa* was used locally over the involved joints of both the group, by mixing the *Rasona Rasnadi Churna* with *Eranda taila*. Both of these drugs are well known for having *Vata-Kaphahara and Shula-Shothahar* action. Thus, the combination as a whole was used.

All the raw drugs for the purpose of research work were collected from the Pharmacy of Gujarat Ayurved University, Jamnagar. The correct identity and authenticity of raw materials was confirmed by studying its organoleptic and powder microscopy, and then comparing them with the characters mentioned in Ayurvedic Pharmacopia of India. Later, subject experts of Pharmacognosy department, of Institute for Post Graduate Teaching and Research in Ayurved (I.P.G.T. and R.A.), Gujarat Ayurved University confirmed the identification.

Aims and Objectives

1. To study the etio-pathogenesis of *Amavata*.
2. To assess the effect of *Rasona Rasnadi Ghanavati* with *Rasona Rasnadi Lepa* on *Amavata*.
3. To evaluate the role of *Simhanada Guggulu* with *Rasona Rasnadi Lepa* on *Amavata*.
4. To compare the clinical effectiveness of *Rasona Rasnadi Ghanavati* and *Simhanada Guggulu* with *Rasona Rasnadi Lepa* on *Amavata*.

Materials and Methods

Patients fulfilling the criteria for the diagnosis of the disease were registered for the present study irrespective of their age (between 18 to 60 years), sex, religion, occupation and other parameters. The patients were selected from the Out Patient Department of Department of Kayachikitsa I.P.G.T. and RA, Gujarat Ayurved University, Jamnagar hospital.

Criteria for selection

Patient's having the classical features of Amavata[9] like *Angamarda*, *Aruchi*, *Trishna*, *Alasya*, *Jwara*, *Sandhishula*, *Sandhishotha*, and modern parameters of Rheumatoid arthritis (RA)[10] like morning stiffness, pain, tenderness, swelling, fever, raised E.S.R. etc. were included for the present study. The criteria for diagnosing RA as laid down by American Rheumatism Association (A.R.A.)[11] in 1988 was also taken into consideration. Both Seropositive and seronegative RA factor cases RA. Chronicity for more than 10 years, having severe crippling deformity, cardiac disease, pulmonary tuberculosis and Diabetes mellitus patients were excluded. A detailed research proforma was prepared incorporating all the signs and symptoms seen in the disease.

Investigations

The routine hematological and biochemical investigation, RA factor and C-reactive protein (C.R.P.) test were done before and after treatment. Routine stool and urine examination were conducted during the study to see for any changes in the biological system.

Criteria for assessment

The results of the therapy were assessed on the basis of clinical signs and symptoms mentioned in the Ayurvedic classics. The improvements in the condition of patients were assessed on the basis of *Roga Bala*, *Agni Bala*, *Deha Bala*, *Chetasa Bala* and as well as by American Rheumatism Association (ARA 1967) criteria of degree of disease activity.

Clinical assessment

The changes observed in the signs and symptoms were assessed by adopting suitable scoring method and by using appropriate clinical tools.

A. Rogabala

Rogabala was used to assess the degree of disease activity as well as the symptoms of *Amavata*.

The detail of scoring pattern adopted for assessment of clinical sign and symptoms are given below:

Symptoms	Score
Pain in joint	
No pain	00
Mild pain of bearable nature, comes occasionally	01
Moderate pain, but no difficulty in joint movement, appears frequently and requires some Upashaya measures for relief	02
Slight difficulty in joint movements due to pain or severe pain, requires medication and may remain throughout the day	03
More difficulty in moving the joints and pain is severe, disturbing sleep and requires strong analgesics	04
Swelling of the joint	
No swelling	00
Slight swelling	01
Moderate swelling	02
Severe swelling	03
Stiffness of the joints	
No stiffness or stiffness lasting for 5min	00
Stiffness lasting for 5 min to 2 hrs.	01
Stiffness lasting for 2 to 8 hours	02
Stiffness lasting for more than 8 hours	03
Tenderness of joints	
No tenderness	00
Subjective experience of tenderness	01
Wincing of face on pressure	02
Wincing of face with withdrawal of affected parts on pressure	03
Resists to touch	04

B. Degree of disease activity[12]

In the above criteria the maximum score is 30, which represents an average of grade 3 (severely active). By dividing the total score by 10 the grade of disease is obtained and denoted by figures 0 - 3 [Table 1].

C. Dehabala[13]

Dehabala score which was used to assess any improvements in the symptoms are given below:

	Score
Swara Varna Yoga (Revitalization of speech and luster)	
Patient looks cheerful	00
Patient looks gloomy	01
Patient looks tired and lethargic	02
Patients looks depressed	03
Sharira Upachaya (increase in body mass/weight and gain in muscle wasting)	
Weight increase by more than 2 kg	00
Weight increased by 2 kg	01
Weight increased by 1 kg	02
Weight before treatment/No increase in weight	03
Balavriddhi (increase in body strength)	
Patient with normal body strength and able to do his work as usual	00
Reduced body strength than normal but does not interfere with routine works	01
Reduced body strength to a level where patients gets fatigued with the little work	02
Patient feels fatigue on minimal walk/walking/ daily activity	03

D. Agni bala[14]

Scoring according to *Jirna Ahara Lakshana*:

Presence of all (five) symptoms after 6 hrs	- 0	}	*Pravara*
Presence of four symptoms after 6 hrs	- 2	}	
Presence of three symptoms after 6 hrs	- 4	}	*Madhyama*
Presence of two symptoms after 6 hrs	- 6		
Presence of one symptom after 6 hours	- 8		*Avara*

Agnibala score which was used to assess the digestion related symptoms are given below:

Ruchirahara Kale (Taste and appetite)	
Equal willing towards all Bhojya Padartha	00
Willing towards some specific Ahara or Rasavishesha	01
Willing towards only most liking food and not to other	02
Unwilling for food, but takes meal	03
Total unwilling for meal	04
Abhyavarana-Abhilasha (Revival and improvement in hunger)	
Person taking food in normal quantity twice a day	00
Person taking food in moderate quantity twice a day	02
Person taking food in less quantity twice a day	04
Person taking food in less quantity once a day	06
Person not at all taking food	08
Ahara Kale Samyagajaranam (Digestion of ingested food within time) –	
Jirna Ahara Lakshana symptoms were considered, which are as given below:	
Utsaha	
Laghuta	
Udgar Shuddhi	
Kshut Trishna Pravritti	
Yathochita Malotsarga	

E. Chetasa bala[14]

Chetasbala score which was used to assess symptoms by comparing it with the before treatment status are given below:

Nidralabho Yathakale (Sleep in proper time and cessation in symptom *Nidra-Viparyaya*)	
Sound sleep for 8 hours	00
Sleep 8 hours but disturbed leading to day sleep	01
Sleep less than 8 hours and disturbed leading to day sleep	02
Vaikarika Swapnanama Adarshanam (No pathological dreams)	
Dreams absent (Sound sleep)	00
Some dreams but physiological	01
Presence of pathological dreams	02
Mana *Buddhi Indriya Avyapatti* (Proper and unaltered functioning of mind, intellect and sensories)	
Normal	00
Mild problem in orientation	01
Moderate problem in orientation	02
Absence of orientation	03
Sukhen cha pratibodhanam (Feeling of well being)	
Feeling complete healthy	00
Feeling much cheerful	01
Some improvement in feeling of well-being	02

Follow-up

A follow-up was done one month after completion of the treatment to check for any recurrences.

Dietary restrictions

The patients were strictly advised to follow certain restrictions and guidelines regarding food, food habits and life style. They were instructed to avoid all the possible causes of *Agnimandya*.

Groups

Total 101 patients of *Amavata* (Rheumatoid arthritis) were registered for the present study. They were randomly divided into two groups. Out of these, 84 patients completed the study and there were 17 drop-out cases.

(I) Rasona Rasnadi Ghanavati group (Group A)

In this group 51 selected patients of *Amavata* were registered, out of which 43 completed the trial. These patients were given *Rasona Rasnadi Ghanavati* (250 mg *Vati*) in the dose of 2 *vati* three times a day with *Anupana Koshna Jala* for 3 months. Along with this, *Rasona Rasnadi lepa* was applied locally over affected joints twice a day for 3 months.

(II) Simhanada Guggulu group (Group B)

In this group, 50 selected patients of *Amavata* were registered, out of which 41 completed the trial. These patients were given *Simhanada Guggulu* (500 mg in the *Vati* form) in the dose of 2 *vati* three times a day with *Anupana Koshna Jala* for 3 months. Along with this, *Rasona Rasnadi lepa* was applied locally over affected joints twice a day for 3 months.

The dose of *Rasona Rasnadi Lepa*[15] was decided according to the number of joints involved.

Table 1: For diagnostic as well as for assessment purpose, the degree of disease activity was estimated on the basis of criteria laid down by American Rheumatism Association (1967)

Grade	0	1	2	3
Fatigue	Not there	Full time work despite fatigue	Patient must interrupt work to rest	Fatigued and requiring long term rest
Grip strength	200 mmHg or more	199 to 120 mmHg	119 to 70 mmHg	Under 70 mmHg
Westergren erythrocyte sedimentation rate (E.S.R.) (in 1st hour)	0 to 20	21 to 35	36 to 50	Above 50
Haemoglobin (in gm%)	12.5 or more	12.4 to 11	10.9 to 9.5	<9.5
General function	All activity without difficulty	Most activity but with difficulty	Few activity cares for self	Little self care mainly on chair and bed
Patients estimate	Fine	Almost well	Pretty good	Pretty bad
Physicians' estimate of RA activity	Inactive	Minimally active	Moderately active	Severely active
Apart from these criteria of ARA (1967) two other criteria were added here.				
Foot pressure (in kg)	25-21	20-16	15-10	<10
Walking time (for 25 feet in number of seconds)	15-20	21-30	31-40	>40

Observations

In this study majority of patients, i.e., 73.26% belonged to the age group of 31-50 years and 84.15% were female. The 79.20% patients were Hindu, 91.08% were married, 71.28% patients were housewives, 67.32% were from low income group and 79.20% of the patients were consuming analgesic and steroids. Majority of the patients had *Vata-Kapha Prakriti* (46.53%) and 50.49% had *Vata-Pitta Parkriti*. The percentage of patients in other groups considered was as follows: *Mandagni* (53.46%), *Madhyama Satva* (56.43%), *Madhyama Sara* (96.03%) and *Madhyama Samhanan* (92.07%). The 37.62% patients had menopause.

Most of the patients, i.e., 42.57% had positive family history of RA, 62.37% of patients had gradual onset and 51.48% had chronicity of more than 2 years. In this study, RA factor was found positive in 31.68% of patients and raised E.S.R found in 78.21% of the patients. All the patients showed aggravation of the disease during *Sheetkaala* and *Meghodaya Kaala*. Most of the patients were found to be indulged in *Viruddhahara* (95.04%), *Atiguru* (24.75%), *Bhojanattora Vyayama* (87.12%), *Divaswap* (52.47%), *Vishamashana* (78.21%), and *Snigdha Ahara* (22.77%). With respect to cardinal symptoms, *Sandhishula*, *Sandhigraha* and *Sparsha-Asahyata* was observed in all the patients, i.e., 100%, followed by *Sandhishotha* in 96.03% of patients.

With respect to general symptoms, the percentage of patients exhibiting each symptom was as follows: *Angamarda* (82.17%), *Aruchi* (31.68%), *Gaurva* (71.28%), *Apaka* (79.20%), *Shoonta-Anganama* (90.09%), *Alasya* (98.01%), *Trishna* (40.59%) and *Jwara* in 7.92% patients. Maximum patients experienced *Utsaha-hani* (98.01%), 83.16% experienced *Agni-daurbalya* followed by 60.39% for *Anaha*, 52.47% *Vid-Vibaddhata*, 51.48% *Nidraviparyaya* and 45.54% had *Kukshi-Kathinta*.

It was observed that *Proximal Interphalangeal Joint* (P.I.P) was involved in 97.02% of the patients. 84.15% patients had wrist, 82.17% knee, 63.36% ankle, 59.40% elbow, 57.42% shoulder, 46.53% neck, 32.67% hip and 25.74% patients had meta carpo phalangeal joint involvements.

Results

Effect of trial drugs in cardinal symptoms

Dehabala Pariksha

In *Dehabala Pariksha*, 60.25% of the improvement was recorded in the *Swaravarna Yoga*, 43.41% in *Sharir Upachaya* and 50.64% improvement in *Balavriddhi* after the treatment in group A, while 65.43% of the improvement was recorded in the *Swaravarna Yoga*, 54.47% in *Sharir Upachaya* and 51.76% improvement in *Balavriddhi* recorded in group B. Both the results were statistically highly significant ($P<0.001$) [Tables 2-7]

Agni Bala Pariksha

In *Agnibala Pariksha*, 80.76% of the improvement was recorded in the *Ruchira-Aharkale*, 63.49% in *Abhyavarana Shakti* and 54.95% improvement in *Jarana Shakti* after the treatment in group A, while 84.41% of the improvement was recorded in the *Ruchira-Aharkale*, 65% in *Abhyavarana Shakti* and 50.43% improvement in *Jarana Shakti* recorded in group B. Both the results were statistically highly significant ($P < 0.001$).

Chetas Bala Pariksha

In *Chetasbala Pariksha*, 43.75% of the improvement was recorded in the *Nidralabho-Yathakale*, 84% in *Vaikarikanam Swapananam Adarshanama*, 83.33% in *Mana-Buddhi-Indriya Avyapti* and 54.26% improvement in *Sukhana Cha Pratibodhanama* after the treatment in group A, while 44.44% improvement was recorded in the *Nidralabho-Yathakale*, 57.14% in *Vaikarikanam Swapananam Adarshanama* 90% in *Mana-Buddhi-Indriya Avyapti* and 54.47% improvement in *Sukhena Cha Pratibodhanama* recorded in group B. Both the results were statistically highly significant ($P < 0.001$).

General functional capacity

The 23.63% improvement was recorded in general functional

Table 2: Total effect of therapy on *Sandhi Shula* (left and right side joints) in group A and B in the trial

Sandhi Shula **Improvement in %**	Group A (left)		Group B (left)		Group A (right)		Group B (right)	
	No. of pts.	% of imp.*	No. of pts.	% of imp.	No. of pts.	% of imp.	No. of pts.	% of imp.
Unchanged (0-25)	01	2.32	01	2.43	01	2.32	0	00
Mild improvement (26-50)	10	23.25	06	14.63	11	25.58	11	26.82
Moderate improvement (51-75)	13	30.23	23	56.09	14	32.55	21	51.21
Marked improvement (76-99)	09	20.93	09	21.95	07	16.27	07	17.07
Complete remission (100)	10	23.25	02	4.87	10	23.25	02	4.87

*imp - Improvement

Table 3: Total effect of therapy on *Sandhi Shotha* (left and right side joints) in group A and B in the trial

Sandhi Shotha **Improvement in %**	Group A (left)		Group B (left)		Group A (right)		Group B (right)	
	No. of pts.+	% of imp.	No. of pts.	% of imp.	No. of pts.	% of imp.	No. of pts.	% of imp.
Unchanged (0-25)	01	2.32	01	2.56	01	2.38	01	2.63
Mild improvement (26-50)	07	16.27	03	7.69	07	16.66	06	15.78
Moderate improvement (51-75)	11	25.58	14	35.89	11	26.19	08	21.05
Marked improvement (76-99)	03	6.97	04	10.25	03	7.14	06	15.78
Complete remission (100)	21	48.83	17	43.58	20	47.61	17	44.73

+pts - Patients

Table 4: Total effect of therapy on *Sandhi Graha* (left and right side joints) in group A and B in the trial

Sandhi Graha **Improvement in %**	Group A (left)		Group B (left)		Group A (right)		Group B (right)	
	No. of pts.	% of imp.	No. of pts.	% of imp.	No. of pts.	% of imp.	No. of pts.	% of imp.
Unchanged (0-25)	01	3.22	03	7.31	01	3.22	02	4.87
Mild improvement (26-50)	08	18.60	07	17.07	06	13.95	11	26.82
Moderate improvement (51-75)	19	44.18	21	51.21	16	37.20	15	36.58
Marked improvement (76-99)	07	16.27	05	12.19	11	25.58	09	21.95
Complete remission (100)	08	18.60	05	12.19	09	20.93	04	9.75

Table 5: Total effect of therapy on *Sparsha-Asahayata* (left and right side joints) in group A and B in the trial

Sparsha-Asahyata **Improvement in %**	Group A (left)		Group B (left)		Group A (right)		Group B (right)	
	No. of pts.	% of imp.	No. of pts.	% of imp.	No. of pts.	% of imp.	No. of pts.	% of imp.
Unchanged (0-25)	00	00	02	4.87	01	2.38	00	00
Mild improvement (26-50)	12	27.90	14	34.14	10	23.80	15	36.58
Moderate improvement (51-75)	15	34.88	14	34.14	12	28.57	14	34.14
Marked improvement (76-99)	05	11.62	06	14.63	09	21.42	07	17.07
Complete remission (100)	11	25.58	05	12.19	10	23.80	05	12.19

Table 6: Comparative effects of test drugs in Group A and Group B on overall improvement in cardinal symptoms of *Amavata* in the trial (By paired t test)

Cardinal symptom	Gr.	'*n*'	Mean score		X	% Relief	S.D.±	S.E.±	'*t*'	*P*
			B.T.	A.T.						
Sandhi-Shula	A	43	18.30	5.74	12.56	68.61	4.74	0.72	17.34	<0.001
	B	41	21.34	7.48	13.85	64.91	5.14	0.80	17.23	<0.001
Sandhi-Shotha	A	43	7.81	1.91	5.91	75.59	3.06	0.46	12.62	<0.001
	B	41	8.14	1.90	6.24	76.64	4.33	0.67	9.22	<0.001
Sandhi-Graha	A	43	16.81	5.37	11.44	68.05	3.90	0.59	19.21	<0.001
	B	41	18.78	7	11.78	62.72	6.01	0.93	12.54	<0.001
Sparsha-Asahyata	A	43	14.53	4.84	9.70	66.72	4.05	0.61	15.67	<0.001
	B	41	16.78	6.26	10.51	62.64	4.44	0.69	15.14	<0.001

B.T.- Before treatment; A.T.- After treatment

Table 7: Overall effect of therapy on *Amavata* on 84 patients belonging to Group A and Group B

Effects	Group A (*n* = 43)		Group B (*n* = 41)	
	No. of pts.	%	No. of pts.	%
Unchanged (<25%)	0	0	0	0
Mild improvement (26-50%)	08	18.60	07	17.07
Moderate improvement (51-75%)	15	34.88	24	58.53
Marked improvement (76-99%)	14	32.55	08	19.51
Complete remission (100%)	06	13.95	02	4.87

capacity after the treatment in group A, while 19.64% improvement was recorded in group B.

Degree of disease activity

The 18.05% of the improvement was recorded in degree of disease activity after the treatment in group A, while 21.91% improvement recorded in group B.

Effect on erythrocyte sedimentation rate

The 8.80% reduction in the elevated ESR levels was recorded after the treatment in group A, while 14.32% reduction was recorded in group B.

Comparison

Though results of both the groups were statistically highly significant ($P < 0.001$) the data pertaining to the effect of test drugs on improvement on *Sandhishula*, *Sandhishotha*, *Sandhigraha* and *Sparsha-Asahyata* have been summarized, suggests that the drug used in group A was more effective.

So from the obtained data, it may be inferred that the treatment schedule of group A is more effective than test drug of group B when overall improvements in cardinal symptoms are concerned.

Overall effect of therapy

In *Rasona Rasnadi Ghanavati* group 34.88% of patients showed moderate improvement, while in *Simhanada Guggulu* group 58.53% of patients belonged to the same category. On the other hand, 6 (13.95%) patients in *Rasona Rasnadi Ghanavati* group got complete remission, however, only 2 (4.87%) patients from *Simhanada Guggulu* group could have a similar experience.

Total effect of therapy

The 68.91% of patients in group A, while 65.16% of patients in group B showed improvement in condition. Both the results were statistically highly significant.

Thus patients belonging to group A showed better improvement in their condition as compared to group B patients.

Aggravation during one month follow up

In a one month follow up study, more aggravation was found in *Sandhishula*, *Sandhigraha* and *Sparsha-asahyata* in Simhanada Guggulu treated group; while *Rasona Rasnadi Ghanvati* group showed more aggravation in *Sandhishotha*.

Discussion

Sedentary life style, stressful situations and fast food dietary patterns are responsible factors for the manifestation of disease. The etiological factors like *Guru Ahara*, *Viruddhahara*, *Viruddha Cheshta*, *Mandagni*, *Snigdhabhuktavata Vyayama* etc[16] are responsible for *Amavata*. Derangement of *Agni*, that is *Agnimandya*, (hypo-functioning of *Agni*) is a chief factor responsible for the formation of *Ama*.

Asthis (bones) and *Sandhis* (joints) are the most affected parts in *Amavata*. Root source of these are *Majjavaha Srotas*[17] which are directly afflicted with *Viruddha Ahar-Vihar*[18] So we can say that *Viruddha Ahara* and *Viruddha Cheshta* both contribute as *Nidanas* in pathogenesis of *Amavata*. Again *Vyayama* is said to be a causative factor for the *Shakha Gati* of *Doshas*.[19] If there is already Ama condition and *Vyayama* is done, the increased *Vata* will take the *Ama* to the *Shakha* then causing its *Sthanasamshraya* in the *Sandhis*, leading to *Amavata*. After studing the etiopathogenesis of *Amavata*, it is found that above factors individually or together lead to the *Kapha Prakopa* or *Vataprakopa* or both Along with this role of psychological factors also should be considered.

In *Amavata*, partially digested dietary substances accumulated at the level of intestine may cause Gastro-enteritis. Part of the *Ama* may get absorbed through the intestinal mucosa, and circulating through the entire body may perform a role of antigen, consequently vitiating the *Dosha* to cause different disorders. The basic pathogenesis of Rheumatoid arthritis is Antigen-antibody complex mediated tissue injury (Autoimmune antibody production).

The pathogenesis of *Amavata* bears some similarity to the recently described intestinal permeability syndrome (IPS). The impetus for IPS is a process by which some agent or combination of agents initiate an inflammatory response in the digestive tract. Persistent gastrointestinal inflammation eventually disrupts the integrity of the mucosal lining of the gut, and tiny perforations allow for molecules larger than usual to cross this barrier. This includes molecules' from dietary protein and fats, bacteria, parasites and fungi. In response to this infiltration, an immune response is initiated, and the body begins to manufacture specific antibodies to these antigens. Once activated, these antibodies then circulate and 'look' for more antigens. If any tissue has markers similar to the exogenous antigen, the antibody initiates an immune response and the tissue destruction begins (Galland 1993).[20]

It was observed that the hand joint involvement was seen in 100% patients. *Amavata* is a disease which starts mainly in the small joints, especially PIP. (PIP is regarded as the most busy joint as a person uses this joint atleast 2000 times everyday if he is in the conscious state). Newer studies also indicate that the hand joint is most prone for Rheumatoid arthritis, because of the small amount of bursae. As the bursae is a sac of synovial fluid, it acts as a shock absorber, and decreases the chances of inflammation.[21] The finger joint like PIP and the MCP joint which do not have bursae, are most prone to RA. This is in accordance to the A.R.A. criteria of 1988, that states that atleast one hand joint involvement is mandatory for diagnosing a case of Rheumatoid arthritis.[22] More aggravation of *Vata Dosha* occurs at *Sandhi Sthana* due to obstruction of

Srota by the *Kleda* of more virulent *Ama* which is formed due to combination with *Tridosha* in to the *Srotas* at *Sandhisthana*. This can cause an increase in the chances of *Sthana-Samshraya*.

While mentioning about the management of *Amavata*, which is a disease condition of *Ama* and *Vata* dominance, *Acharyas* explained that drugs which have *Deepana*, *Ama-Pachana*, and *Vatashamaka* properties are useful in *Amavata Chikitsa*. Due to chronic nature of the disease *Rasayana*, immuno-modulator drugs are very helpful for the rejuvenation of the all *Dhatus*. Most of the drugs of both groups have *Katu Tikta Rasa*, *Ushna Virya*, *Rasayana*, *Amapachaka* and *Vatashamaka* properties which help to disrupt the pathogenesis of *Amavata*.

Ghanavati group shows better result in relieving *Sandhishula* (68.61%), while *Simhanada Guggulu* group showed better result relieving *Sandhishotha* (76.64%). *Sandhishula* is due to *Vataprakopa*, and in *Ghanavati* almost all drugs have *Vata-Kaphashamaka* properties with *Ushna Tikshna Guna*, which further stops *Ama* formation and *Vayu Vikriti*. *Acharya Charaka* had used *Rasna* in *Vatavyadhi Chikitsa* as a *Shreshtha Vataharanam*[23] which may have acted as a factor in relieving *Sandhishula*.

Sandhisotha may be due to the *Avarana* of *Kapha*. *Simhanada Guggulu* has *Srotoshodhaka*, *Lekhana* and *Agnidipana* properties, which elevates the *Agni* and checks further *Ama* formation. This may be the probable cause of the result obtained by *Simhanada Guggulu* group.

The relief provided by both groups *Ghanavati* and *Guggulu* in *Sandhigraha* and *Sandhi Sparsha-Asahyata* was statistically highly significant. However, *Ghanavati* showed better result in both these symptoms.

Sandhigraha and *Sparsha Asahyata* may be due to the *Avarana* of *Kapha* and *Vyana-Samana Vayu Dushti*. Due to their *Katu Tikta Rasa*, *Ushna Virya*, *Rasayana Prabhava*, *Amapachaka* and *Vatashamaka* properties, ingredients of *Rasona Rasnadi Ghanavati* help to disrupt the pathogenesis of RA, which may be the cause behind Ghanavati giving better symptom relief.

Probable mode of action of *Rasona Rasnadi Ghanavati*

Rasona Rasnadi Ghanavati has 10 ingredients. Most of the drugs have *Katu Tikta Rasa*, *Ushna Virya*, *Rasayana*, *Amapachaka* and *Vatashamaka* properties, which help to disrupt the pathogenesis cycle of *Amavata*. The properties of each of the 10 ingredients are as follows: *Nirgundi* has *Shula* and *Shothahar Prabhava*; *Lahsuna* has *Medhya*, hypolipidemic and *Rasayana*; *Rasna* has *Shula* and *Shothahara*; *Shunthi* has *Amapachaka* and *Rasayana*; *Guduchi has Rasayana* and immunomodulatory properties; *Amaltas is Mrudu-virechak* and *Kusthaghna Rasayana*; *Punarnava acts as* haematinic and *Shothahara* and liver protective; *Gokshura* is liver protective and *Shothahara*; *Eranda is Shula - Shothahara* and *Rasayana* and *Devadaru* has *Amapachaka* and *Shothahara Prabhava*. Each drug has unique properties which help to minimize the symptoms and destroy the *Samprapti*. Also, they help to develop the immune power, helping the patients to regain the *Dehabala* and lusture.

Tikta and *Katu Rasa* present in *Rasona Rasnadi Ghanavati* possess antagonistic properties to *Ama* and *Kapha* which are the chief causative factors in this disease. Because of their *Agnivriddhikar* property, they improve the digestive power. Thus, *Amarasa* is digested and excessive production of *Kapha* is reduced which in turn removes the obstruction of the *Srotas*. Because of *Tikshna Guna* and *Ushna Virya* it also alleviates vitiated *Vata*. The *Tikshna* and *Ushna* properties of *Rasona Rasnadi Ghanavati* do not allow the *Ama* to linger at the site of pathogenesis; thus reducing *Srotorodha* and pain. It also possesses antagonistic actions to *Sheeta* and *Ruksha Guna* of *Vata*. Thus, *Rasona Rasnadi Ghanavati* controls *Ama* and *Vata* together and inhibits the pathogenesis of RA. *Rasona Rasnadi Ghanavati* has anti oxidant properties which neutralize the *Ama* (Free radical like substance) by scavenger action and *Rasayana* effect. The *Rasayana* drug activates cellular metabolism, modulates the immune system and increases and activates body's own antioxidants and radical scavengers.[24]

Probable mode of action of *Simhanada Guggulu*

The *Simhanada Guggulu* has ingredients which have *Ushna Veerya*, *Katu Vipaka*, *Ruksha* and *Snigdha Guna* properties, along with drugs such as *Triphala*, *Gandhaka*, *Guggulu* and *Eranda* oil which have has *Rasayana* effects. The properties of its other ingredients are as follows: *Triphala* is *Rasayana*, *Mridu-Virechaka*, antioxidant; *Guggulu* has *Shulahara*, *Shothahara*, *Rasayana properties*; *Gandhaka* is *Kushthaghna Rasayana* and *Eranda* oil is *Vaatanuloman*, *Vrishya Rasayana*. Among these, *Triphala* and *Guggulu* have proved anti-oxidant properties.[2]

In the first stage of disease pathogenesis, *Amotpatti* takes place. At this stage, *Simhanada Guggulu* shows *Amapachana* as all the general pharmacodynamic properties of *Simhanada Guggulu*, i.e., *Lahgu*, *Tikshna*, *Ruksha Guna*, *Katu*, *Tikta Rasa*, and *Ushna Veerya* are against the *Guru*, *Snigdha*, *Picchila* and *Sheeta* properties of Ama. Also, *Simhanada Guggulu* has some anti-oxidant properties which act against *Ama*. Later, *Yugapata Prakopa* of *Doshas* is checked by *Vata-Kaphahara* action of drugs. Further, *Ama* formation is stopped by the *Deepneeya* action. In the *Srotoabhishyanda*, it shows *Srotoshodhana* and relieves the symptoms of *Sandhishula*, *Shotha*, *Aalsya and Aruchi* by its analgesic and anti-inflammatory action. Also associated symptoms like *Vibandha and Anaha* are reduced by *Anulomana*, i.e., purgative properties of the drug due to *Eranda* oil and *Triphala*. Most of the drugs are *Vata-Kapaha Shamaka* and *Agnivardhaka*, so it is very suitable for the *Samprapti Vighatana* of the disease and to combat the main culprits of *Vata*, *Kapha(Ama)* and *Mandagni*, the root causes of *Amavata*.

Probable mode of action of *Rasona Rasnadi Lepa*

The *Lepa* acts through dilution of the accumulated toxins and increasing the peripheral vascularization. On the other hand, it inhibits the synthesis and release of acetylcholine in the inflamed joints. This effect of *lepa* can be attributed to the *Shothahara* and *Shulahara* (antiinflammatory) properties of majority of the drugs.[24]

Most of the drugs of *Rasona Rasnadi Lepa* have *Laghu*, *Tikshana*, *Ruksha Guna*, *Katu*, *Tikta Rasa*, and *Ushna Veerya* properties, all of which act against *Ama*. It first relieves the *Pratyatma Lakshana* of *Amavata* locally. These include:

Sandhishula, *Sandhishotha*, *Sandhigraha* and *Sparsha-asahyata* by its *Vednasthapana*, *Shula-shothahara*, and anti-inflammatory effect. When we use the *Rasona Rasnadi lepa* locally, it produces the local counter irritant effect and dilutes the accumulated *Doshas*. It also absorbs the *Doshas* by *Ushna Tikshna Guna*, which leads to *Shamana* of viatiated *Ama* and *Vata*. Hence, it can be concluded that the local application of *Rasona Rasnadi* lepa with the medical intervention is very beneficial against the symptoms of *Amavata*.

Conclusion

At the end of the study, following conclusions can be drawn on the basis of observations made, results achieved and thorough discussion: The disease *Amavata* is produced by the *Tridosha*, though *Ama* and *Vata* are the inititaing factors for its pathogenesis. *Viruddha-Ahara Sevana* and doing moderate to severe exercise after meal were found as prominent etiological/ promoting factors in majority of patients. Better results were observed in *Sandhishula*, *Sandhigraha* and *Sparsha-Asahyata* in *Ghanavati* group. This may be due to the *Vata-Kaphshamaka* properties and *Ushna Tikshna Guna* of the drugs. On *Dehabala*, *Agnibala* and *Chetasbala* associated symptoms, both the groups provided statistically highly significant results. No side effects of the research drugs were observed during the clinical study. Lastly, it can be concluded that both the groups show significant results; however with respect to complete remission rate, Group A therapy is more effective than group B in the management of Amavata.

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