Original Article

Indian Journal of Ancient Medicine and Yoga
Volume 12 Number 3, July - September 2019
DOI: https://dx.doi.org/10.21088/ijamy.0974.6986.12319.1

A Comparative Study on the Efficacy of *Erandadi* and *Rasonadi* Decoctions on *Amavata* (Rheumatoid Arthritis)

SMS Samarakoon[1], KTM Jayasinghe[2], TD Dayawaradana[3], SKMK Herapathdeniya[4]

Author Affiliation: [1-4]Senior Lecturer-I, Institute of Indigenous Medicine, University of Colombo, Sri Lanka. [2]Intern Medical Officer, National Ayurveda Teaching Hospital, Colombo -08, Sri Lanka. [3]Ayurveda Community Medical Officer, Department of Ayurveda, Western Province, Sri Lanka.

Corresponding Author: Dr. SMS Samarakoon, Head & Senior Lecturer-I, Dept. of Deshiya Chikitsa, Institute of Indigenous Medicine, University of Colombo, Rajagiriya, Sr Lanka.

E-mail: samarakooniim@gmail.com

Received on 22.07.2019; **Accepted on** 16.08.2019

Abstract

The present study was aimed at evaluating comparative effect of *Erandadi* and *Rasonadi* Decoctions on *Amavata*. 40 patients of *Amavata* were randomly selected from the OPD of Meegoda Ayurveda hospital and equally divided into two groups: group A and group B. The group A was treated with *Erandadi* Decoction (ED), and group B was treated with *Rasonadi* Decoction (RD) for a period of one month and followed up for a one month. Data were analyzed by SSPS statistical software. The majority of patients of *Amavata* were female (95%) and in 46–50 age group (52.5%). Clinical features of *Amavata* were aggravated by cold water (75%), walking (60%) and rainy weather (57.5%) while it was relieved by rest (75%). Considering *prakriti*, majority of patients had *vata-kapha prakriti* (60%). ED improved joint pain, tenderness and disturbed sleep in highly significant manner (p<0.001) whereas stiffness, loss of appetite, heaviness and thirst was improved in significant manner (p<0.05). ED improved ESR, pulse rate, WBC and lymphocyte count in highly significant manner (p<0.001). RD improved joint pain, stiffness, tenderness and loss of appetite in highly significant manner (p<0.001) whereas disturbed sleep, heaviness and thirst was improved significantly (p<0.05). RD improved pulse rate, WBC and lymphocyte count in highly significant manner (p<0.001). When comparing the effects of ED and RD, it was evident that RD is more effective over ED in improving subjective as well as objective parameters of *Amavata*.

Keywords: *Amavata*; Rheumatoid Arthritis; *Rasonadi* Decoction; *Erandadi* Decoction.

How to cite this article:

SMS Samarakoon, KTM Jayasinghe, TD Dayawaradana *et al.* A Comparative Study on the Efficacy of *Erandadi* and *Rasonadi* Decoctions on *Amavata* (Rheumatoid Arthritis). Indian J Ancien Med Yog. 2019;12(3):81-85.

Introduction

Amavata is a particular type of chronic systemic disease mentioned in Ayurveda with poor prognosis in the period of *Madhavakara* (16th century A.D.) under the category of *vata-kaphaja* disorders which is caused due to the vitiation of *vata* associated with *ama*. Joints are mainly affected with very severe pain and swelling with relapsing nature. The term *Amavata* derived from "*Ama*" and "*vata*", the word *ama* is the condition which in various ailments in system due to its toxic effect. The disease occurs due to the consumption of *viruddha ahara* and *cheshta* and simultaneous indulgences with preexistence of *mandagni* causes *ama*. Vitiated *vata* circulates

the *ama* all over the body through the channels and accumulate in *sleshmasthana* (*amashaya, Sandhi, etc.*) producing symptoms like *shotha* (joint swelling), *sandhi-shoola* (joint pain), *stabdhata* (morning stiffness), and *karmanasha* (inability of joint movements)[1] According to the nature of the disease, it is essential to work on such therapy which has *Ama-pachana* and *vatahara* properties.

Amavata may be correlated with Rheumatoid arthritis which is the commonest form of chronic inflammatory, destructive and deforming joint disease.[2] 2–3% of world population are reported to suffer from Rheumatoid arthritis. Treatment of Rheumatoid arthritis in Sri Lanka with Allopathic and other forms of treatment have been less effective during the last few decades[3] and provide the symptomatic relief but the underlined pathology goes on unchecked due to the absence of effective therapy.[4]

Therefore, *Erandadi* decoction (ED) and *Rasonadi* decoction (RD) were selected for this study[5] and aimed at evaluating the effect of *Erandadi* and *Rasonadi* decoctions on *Amavata* which are said to be effective on and have been used for hundreds of years in the treatment of *Amavata*. The ingredients of ER are *Eranda* (*Ricinus communis*), *Gokshura* (*Tribulus terrestris*), *Rasna* (*Alpinia galanga), Sathapushpa (Foeniculum vulgarenill)* and *Punarnawa* (*Boerhavia diffusa).* The ingredients of RD are *Rasona (Allium sativum), Vishva (Zingiber officinalis)* and *Nirgundi (Vitex negundo).*[6]

Objectives

General objective of this study is to evaluate the efficacy of *Erandadi* and *Rasonadi* decoctions on *Amavata* comparatively. Specific objectives are to study the etio-pathogenesis of *Amavata* and Rheumatoid arthritis based on Ayurveda and Modern medicine and to evaluate the effect of *Erandadi* decoction and *Rasonadi* decoction on *Amavata* separately.

Methodology

This study is a comparative clinical study for which patients were selected from the OPD of *Meegoda* Ayurveda hospital. Written informed consent was taken from each patient before subjecting to the study. The patients of both sexes, age 20–50 years, having signs and symptoms of RA, chronicity less than 5 years, having no severe deformities, no any chronic disease like cardiac disease, pulmonary TB, diabetes mellitus, high blood pressure, gout, osteoarthritis, polyarthritis nodosa, osteoporosis, carpal tunnel syndrome, high serum cholesterol and cancer were excluded in the study. Decoctions were prepaired at Meegoda Ayurveda Hospital as per classical references.[6]

The selected 40 patients randomly and equally divided into two groups: group A and group B. The group A was treated with *Erandadi* Decoction (ED), and group B was treated with *Rasonadi* Decoction (RD) 120 ml, before meal twice a day for a period of one month and the follow-up period was one month. Data were analyzed by using SSPS statistical software.

Results

The majority of patients were found female (95%) Buddhists (100%), in 46–50 age group (52.5%), laborers (45%), having primary education (62.5%), married (90%) and living in rural area (80%). The majority of patients were suffering from joint pain (100%), tenderness (95%), joint swelling (92.5%) loss of appetite (90%), morning stiffness (87.5%), heaviness of body (60%) and body ache (50%). The majority of patients were having gradual onset (80%) of *Amavata.*

The symptoms of *Amavata* were aggravated by cold water (75%), walking (60%) and rainy weather (57.5%) whereas they were relieved by rest (75%). Considering food habits, the majority of patients had mixed dietary habit (90%), *Viruddha ahara* (75%) and *vishamashana* (65%). Majority of patients had poor appetite (80%), *mandagni* (82.5%) and *mridukoshta* (47.5%). Similar results have been obtained by another researcher.[7] Regarding the dominant *rasa* in diet, majority of patients had *lavana rasa* (47.5%) and *amla rasa* (45%). The majority of patients had *Vata-kapha* type of *prakriti* (60%). Considering *aharashakti*, the majority of patients had *madhyama abhyavaharana shakti* (65%) and *madhyama jarana shakti* (65%).

*Effect of **Erandadi** Decoction on **Amavata***

Table 1: Effect of *Eranadadi* Decoction on Clinical features of *Amavata*

Parameter	Mean		SD		*p*
	BT	AT	BT	AT	
Joint pain	2.85	1.20	0.37	0.77	$p<0.001$
Tenderness	1.90	0.70	0.72	0.47	$p<0.001$
Morning stiffness	1.75	0.60	1.16	0.60	$p<0.05$
Disturb of sleep	1.15	0.30	0.81	0.47	$p<0.001$
Loss of appetite	1.45	0.15	0.99	0.36	$p<0.05$
Heaviness	1.00	0.10	0.86	0.45	$p<0.05$
Thirsty	0.80	0.10	0.89	0.31	$p<0.05$

Data were analyzed by Wilcoxon Sign Rank test using SPSS statistical software. The mean score of joint pain (from 2.85 ± 0.37 to 1.20 ± 0.77), tenderness (from 1.90 ± 0.72 to 0.70 ± 0.47) and disturbed sleep (from 1.15 ± 0.81 to 0.30 ± 0.47) was decreased in statistically highly significant manner (p<0.001); whereas the mean score of morning stiffness (from 1.75 ± 1.16 to 0.60 ± 0.60), loss of appetite (from 1.45 ± 0.99 to 0.15 ± 0.36), heaviness (from 1.00 ± 0.86 to 0.10 ± 0.45) and thirsty (from 0.80 ± 0.89 to 0.10 ± 0.31) was reduced which is statistically significant (p<0.05) (Table 1).

*Effect of **Erandadi** Decoction on objective parameters*

Objective parameters were analyzed by paired t test using SPSS statistical software. The mean value of ESR (from 23.10 ± 11.53 to 17.05 ± 8.25), body temperature (from 36.50 ± 0.25 to 36.12 ± 0.27), right sided knee joint swelling (from 46.23 ± 4.53 to 45.31 ± 4.60) and left sided knee joint swelling (from 45.90 ± 4.68 to 44.86 ± 4.78), pulse rate (from 72.10 ± 3.64 to 70.80 ± 3.60), WBC (from 8.69 ± 1.54 to 7.59 ± 1.36) and lymphocyte (from 3.10 ± 0.84 to 2.33 ± 0.56) was reduced in highly significant manner (p<0.001); whereas the mean value of respiratory rate (from 13.95 ± 1.66 to 13.55 ± 1.43) and eosinophil (from 0.05 ± 0.10 to 0.04 ± 0.10) was reduced which is statistically significant (p<0.05). The mean value of neutrophil count was decreased (5.38 ± 0.97 – 5.06 ± 1.10) which is statistically insignificant (p>0.05).

*Effect of **Rasonadi** Decoction on **Amavata***

Table 2: Effect of *Rasonadi* Decoction on clinical features of *Amavata*

Parameter	Mean		SD		p
	BT	AT	BT	AT	
Joint pain	2.65	0.95	0.48	0.82	p<0.001
Tenderness	1.90	0.55	1.02	0.82	p<0.001
Morning stiffness	2.45	0.75	0.88	0.85	p<0.001
Disturb of sleep	0.95	0.35	0.68	0.74	p<0.05
Loss of appetite	1.85	0.15	0.74	0.36	p<0.001
Heaviness	0.80	0.20	0.76	0.52	p<0.05
Thirsty	0.85	0.20	0.87	0.41	p<0.05

The mean score of joint pain (from 2.65 ± 0.48 to 0.95 ± 0.82), tenderness (from 1.90 ± 1.02 to 0.55 ± 0.82), morning stiffness (from 2.45 ± 0.88 to 0.75 ± 0.85) and loss of appetite (from 1.85 ± 0.74 to 0.15 ± 0.36) was decreased in statistically highly significant manner (p<0.001); whereas the mean value of disturbed sleep (from 0.95 ± 0.68 to 0.35 ± 0.74), heaviness (from 0.80 ± 0.76 to 0.20 ± 0.52) and thirsty (from 0.85 ± 0.87 to 0.20 ± 0.41) was reduced which is statistically significant (p<0.05) (Table 2).

*Effect of **Rasonadi** Decoction on Objective Parameters*

The mean value of body temperature (from 36.43 ± 0.30 to 36.11 ± 0.25), right sided knee joint swelling (from 49.34 ± 1.84 to 48.29 ± 1.71) and left sided knee joint swelling (from 49.13 ± 1.74 to 48.23 ± 1.75), pulse rate (from 70.65 ± 6.01 to 68.80 ± 5.63), WBC (from 8.69 ± 1.54 to 7.59 ± 1.36) and lymphocyte count (from 3.10 ± 0.84 to 2.33 ± 0.56) was reduced in highly significant manner (p<0.001); whereas the mean value of ESR (from 38.05 ± 22.21 to 23.25 ± 15.39), respiratory rate (from 13.95 ± 1.70 to 13.45 ± 1.43) and eosinophil count (from 0.05 ± 0.10 to 0.04 ± 0.10) was reduced which is statistically significant (p<0.05). The mean value of neutrophil count was decreased (from 5.38 ± 0.97 to 5.06 ± 1.10) which is statistically insignificant (p>0.05).

*Comparative effect of **Rasonadi** Decoction and **Erandadi** Decoction on **Amavata***

Table 3: Comparative effect of *Rasonadi* and *Erandadi* Decoctions on Subjective parameters

Parameter	Difference of Mean	Difference of SE	t	p
Pain in joint	0.00	0.27	0.00	p>0.05
Morning stiffness	–0.55	0.29	–1.87	p>0.05
Tenderness	–0.20	0.24	–0.83	p>0.05
Loss of appetite	–0.40	0.26	–1.51	p>0.05
Heaviness of body	0.30	0.22	1.35	p>0.05
Disturbed of sleep	0.25	0.18	1.33	p>0.05
Thirsty	0.10	0.26	0.38	p>0.05

The difference of mean of pain in joint (0.00), morning stiffness (-0.55), tenderness (-0.20), loss of appetite (-0.40), heaviness of body (0.30), disturbed of sleep (0.25) and thirsty (0.10) is statistically insignificant (p>0.05) (Table 3).

Table 4: Comparative effect of *Rasonadi* Decoction and *Erandadi* Decoction on objective parameters

Parameter	Difference of Mean	Difference of SE	t	p
ESR	–8.75	3.94	–2.21	p<0.05
Fever	0.10	0.09	1.10	p>0.05
Swelling of right knee	0.01	0.14	0.07	p>0.05
Swelling of left knee	0.29	0.24	1.18	p>0.05
Pulse rate	–0.40	0.49	–0.86	p>0.05
Respiratory rate	–0.10	0.23	–0.41	p>0.05
Neutrophil	0.04	0.17	0.27	p>0.05
Lymphocyte	0.38	0.18	2.15	p<0.05
Eosinophil	–0.0005	0.002	–0.22	p>0.05
WBC	0.31	0.24	1.24	p>0.05

The difference of mean of ESR (-8.75) and lymphocyte (0.38) is statistically significant (p<0.05).

The difference of mean of fever (0.10), swelling of right knee joints (0.01), swelling of left knee joints (0.29), pulse rate (-0.40), respiratory rate (-0.10), neutrophil (0.04), eosinophil (-0.0005) and WBC (0.31) is statistically insignificant (p>0.05) (Table 4).

Discussion

Erandadi Decoction improves joint pain, tenderness, and disturbed sleep in highly significant manner (p<0.001); whereas the improvement of morning stiffness, loss of appetite, heaviness and thirst is statistically significant (p<0.05). ED improves ESR, body temperature, right sided and leftsided knee joint swelling, pulse rate, WBC and lymphocyte in highly significant manner (p<0.001) *Chikitsa Sutra* of *Amavata* includes *langhana*, *swedana*, drugs dominant in *tikta* and *katu rasa* and *agni deepana*, *virechana*, *snehapana* and *vasti*.[8] *Erandadi* Decoction consists of *madura* (60%), *katu* (60%), *tikta* (80%) and *kashaya* (40%) *rasa, snigdha* (60%), *guru* (40%), *tikshna* (60%) and *lagu* (20%) *guna, ushna virya* (60%); *katu vipaka* (60%) and *madura vipaka* (40%). Its pharmacological actions are *vata-hara* (100%), *ama-pachana* (40%), *dipana* (40%) and *kapha-hara* (60%).[9] Scientifically, it has been proven that *Eranda*, *Rasna*, *Shatapushpa* and *Punarnava* has anti-inflammatory and analgesic effects[10]. Moreover, *Punarnava* and *Gokshura* has Diuretic effect.[9] *Eranda* and *Rasna* are known for their *vata-samaka* effect.[9] Collectively, *Erandadi* Decoction has *vatahara*, *dipana*, *ama-pachana*, *kapha-hara*, anti-inflammatory, analgesic and diuretic effects. These pharmacological effects of *Erandadi* decoction are responsible for improving subjective as well as objective parameters of *Amavata* significantly.

Rasonadi decoction improves joint pain, tenderness, morning stiffness and loss of appetite in statistically highly significant manner (p<0.001); whereas the improvement of disturbed sleep, heaviness, and thirsty is statistically significant (p<0.05). RD improves body temperature, right and left sided knee joint swelling, pulse rate, WBC, and lymphocyte count in highly significant manner (p<0.001) whereas the improvement of ESR, respiratory rate, and eosinophil count is statistically significant (p<0.05). The improvement of neutrophil count is statistically insignificant (p>0.05). *Rasonadi* decoction consist of *Madura* (33.33%), *lavana* (33.33%), *katu* (100%), *tikta* (66.66%) and *kashya* (66.66%) *rasa, snigdha* (66.66%), *laghu* (66.66%), *ruksha* (33.33%), and *tikshna* (33.33%) *guna*, *ushna virya* (100%), *katu vipaka* (66.66%) and *Madura vipaka* (33.33%). It has *kapha-hara* (100%), *dipana*, *vata-hara* and *ama-pachana* (66.66%) effects.[10] Scientifically, it has been proven that most of the ingredients of *Rasonadi* Decoction have anti-inflammatory (100%), antioxidant and analgesic effects.[11] These pharmacological actions of *Rasonadi* decoction are responsible for improving most of the subjective and objective parameters significantly. The pharmacodynamic properties of RD shows that it is more effective on *Amavata* than ED.

Conclusion

Considering the pharmacodynamic properties of *Erandadi* Decoction and *Rasonadi* Decoction, it is evident that *Rasonadi* Decoction is more potent in *ama-pachana*, *vata-hara*, anti-inflammatory and analgesic effects. By forgoing, it is evident that *Rasonadi* Decoction is more effective over *Erandadi* Decoction in improving subjective as well as objective parameters of *Amavata.* Therefore, it may be concluded that *Rasonadi* Decoction is more effective over *Erandadi* Decoction on *Amavata*.

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