WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 7.523
Volume 6, Issue 9, 855-869. Research Article ISSN 2277– 7105

A CLINICAL COMPARATIVE STUDY OF SOME *VISHAGHNA DRAVAYA* AND *ERAND TAIL* IN THE MANAGEMENT OF *AMAVATA*

Dr. Bhupinder Singh*[1] and Bhavna Singh[2]

[1]PG Scholar Final Year, Department of Dravyagun Vigyan, Himalyiya Ayurvedic Medical College, Dehradun, India.

[2]Professor, Department of Dravyagun Vigyan, Himalyiya Ayurvedic Medical College, Dehradun, India.

Article Received on
27 June 2017,

Revised on 18 July 2017,
Accepted on 08 Aug. 2017

DOI: 10.20959/wjpr20179-9273

***Corresponding Author**
Dr. Bhupinder Singh
PG Scholar Final Year, Department of Dravyagun Vigyan, Himalyiya Ayurvedic Medical College, Dehradun, India.

ABSTRACT

Herbs are natural remedies for the disease with higher safety profile and efficacy. India has an ancient heritage of traditional herbal medicine in the form of Ayurved. *Amavata* (rheumatoid arthritis) is the most common disease that poses a considerable challenge to physicians. Therefore the present study was carried out to evaluate efficacy of some *vishaghna dravayas* (antitoxic drugs) (*Nirgundi, Haridra, Marich, Sireesh*) and *Erand tail.* For this study, 32 patients satisfying EULAR 2010[1] (European League against Rheumatism) criteria were enrolled from OPD of Himalayiya Ayurvedic Medical College, Dehradun. These patients were randomly divided in two groups, group A (trial drug) and group B (*Erand tail*). Both the groups have sixteen patients each. Duration of trial was four months. ACR[2] (American College of Rheumatology) response criteria were used to assess efficacy. The results of both groups showed highly significant improvement in parameters of clinical and physical disability. On the basis of CDAI[3] (Clinical Disease activity Index) scores the result was highly significant for group B (*Erand tail*) and significant for group A. Results of ESR (Erythrocyte sedimentation rate) and RA (Rheumatoid Arthritis factor) titer were also found significant in both groups and group B (*Erand tail*) showed better result than group A. The results of present study revealed that these drugs have potential to be used in the treatment of rheumatoid arthritis and *Erand tail* is more effective than trial drug.

KEYWORDS: *Ama*, *Amavata*, clinical trial, *Erand tail*, Rheumatoid arthritis, *Vishaghna*.

INTRODUCTION

Simultaneously vitiated *Ama* and *Vata* when lodge in the *Trika* and *Sandhi* leading to *Stabdhata* of the body parts then this condition is known as *Amavata.*[4] On the basis of pathogenecity, signs and symptoms *Amavata* is correlated to the Rheumatoid Arthritis.

Nowadays arthritis and rheumatism has become a big health related problem in the world. Rheumatoid arthritis (RA) is one of the major disabling diseases of auto immune origin. And more problematic fact about it is that all the treatments available in the world for RA are only palliative and non specific. There exists no cure for RA in spite of huge advancement in biomedical science and technology. Rheumatoid arthritis results in disability in majority of patients suffering from it and this systemic disease has many serious complications like plueral effusion, cardiomyopathy, vasculitis etc.[5] In addition to joint deformities and complications, patients who are taking modern medical and chemotherapeutic treatment suffer from serious side effects of drugs. There are significant numbers of patients died from side effects of drugs instead of complications from disease itself.

Vishaghna dravays are drugs which detoxify body and help the body get rid of toxins. Three dravayas *Nirgundi, Sireesh* and *Haridra* are vishaghna drugs mentioned in *Vishaghna Mahakshay* of *Charak samhita.*[6] And *Marich* is also described as *vishanghna dravaya* in *Sharangdhar samhita.*[7] All these four drugs pacify vata dosh due to their ushan veerya (hot potency). Another drug is *Erand tail* an established anti rheumatic drug[8] to which we are going to compare our trial drug.

MATERIALS AND METHODS

Variables

The dependent variables of present study are CDAI, hematological parameters and its associated signs and symptoms while the independent variables are the Vishaghna dravayas and Erand tail.

Selection of patients

32 Patients attending O.P.D. & I.P.D. of Pancakarma Dept., and Kayachikitsa Dept. of Himalyiya Ayurvedic Medical College and Hospital, were selected randomly. All 32 patients were selected for the present study by keeping in view, the symptomatology of Amavata mentioned in Ayurvedic texts as well as criteria mentioned in modern texts for diagnosis of rheumatoid arthritis, irrespective of age, sex, religion and economical status.

Criteria for inclusion

a. Aged between 25-70 yrs.
b. Diagnosed cases of rheumatoid arthritis
c. Having the Signs & symptoms of Amavata
d. Patients willing to participate in the above trial and giving informed consent.

Criteria for Diagnosis

1. Patients having symptoms of Amavata as described in classical texts as follows:

a. Sandhishool
b. Sandhigrah
c. Sandhishoth
d. Sparsh asahtva
e. Jwara
f. Agnimandya
g. Alasya
h. Trishna

2. Patients satisfying diagnostic criteria of ACR/EULAR 2010.

Criteria for exclusion

a. Patients with comorbidities like Diabetes Mellitus Type2, Hypertension, Coronary Artery Disease, Pulmonary Tuberculosis etc.
b. Patients with advanced and severe disease state with deformities like ulnar deviation, swan neck deformity, ankolysis etc.

Study Design

This is a randomized, single blind, controlled clinical study.

Grouping of patients

A total of 32 patients selected for the study were randomly divided in to two following groups:

Group A (n=16): Group A had 16 patients and treated with trial drug only along with *pathya ahaar - vihaar*. trial drugs given in dose of 6 gm with lukewarm water twice a day.

Group B (n=16): Group B had 16 patients and treated with *Erand tail* only along with *pathaya ahaar-vihaar*. *Erand* tail 15 ml BD given with lukewarm water or milk as choice of patient.

Preparation and administration of drugs

The trial drug was procured as following:

- Erand tail was procured from Gulati Pharmacy under name of Castor oil IP.
- Haridra powder and Marich powder was procured from Patanjali Ayurved limited.
- Bark of Shireesh and leaves of Nirgundi were collected from Herbal garden of Himalyiya Ayurvedic Medical College and Hospital and its surrounding areas. And powder of Shireesh bark and Nirgundi leaves was prepared in pharmacy of Himalyiya Ayurvedic Medical College. The powder of all trial drugs was mixed in the following ratio:

a. Haridra rhizome -4 part
b. Nirgundi leaf -6 part
c. Sireesh bark -6 part
d. Marich fruit -1 part

Patients of both the groups were advised same diet regime (pathya ahar – vihar).

Duration: Duration of the trial was 4 months.

Follow up: Every patient was assessed before and after treatment.

Criteria for assessment

Patients in the trial were assessed for any change in subjective or objective parameters on globally recognized response criteria and CDAI as recommended by ACR committee as it allows for common standard of efficacy of drugs in other trials also and contains following parameters:

1. **ACR response criteria.**
2. **Hematological parameters** were recorded in the tabular form at each follow up of patients:

a. Hb (hemoglobin)
b. TLC (Total leukocyte count)
c. ESR (Erythrocyte Sedimentation rate)
d. RA quantitative(titre)
e. Platelet count

3. **Clinical assessments** were recorded in tabular form of the following parameters at each follow up of patients:

a. Grip strength in mmHg on an inflated bulb of sphygmomanometer

b. Foot pressure in kg
c. Walking time in seconds for 25 feet distance
d. Morning stiffness
e. Weight

4. **CDAI (clinical disease activity index).**
5. **Assessment on Functional Capacity:** Functional capacity was assessed with the following parameters:

a. Morning stiffness: patients were questioned about the time period of morning stiffness in minutes.

b. Walking time: The patient was asked to walk a distance of 30 feet and the time taken was recorded before and after the treatment by using stop watch.

c. Grip Strength: The functional capacity of the affected upper limb, especially for both hands with wrist joints was assessed by the patient's ability to compress an inflated ordinary sphygmomanometer cuff under standard condition (i.e. 20 mmHg) and it was recorded before and after the treatment.

d. Foot pressure: The functional capacity of the affected leg, especially affected ankle with metatarsophalangeal joints was assessed by the foot pressure and it was recorded by pressing a weighing machine before and after the treatment.

e. Weight: weight of patients was measured on weighing scale.

Presentation of data and statistical analysis

Hematological parameters and Clinical disability scores were measured and mean score with standard deviation (SD) of both types of parameters were recorded of both groups (A and B) before treatment (BT) and after treatment (AT). Independent 'T'-test was employed to infer any significant difference among the groups for quantitative variables. And Paired 'T'-test was applied to assess the effect of drug from base line to different follow ups in Quantitative and Qualitative variables. In case of paired data with non normal distribution i.e. intra group comparison Wilcoxon signed rank test was used and in case of independent samples with non normal distribution i.e. inter group comparison Mann whitney U test was used. Statistical analysis is done with the PAST 3 software.

OBSERVATIONS

Table 1: Baseline and demographic data.

S. no.	Parameter	Group A (n=12)	Group B (n=13)
1	Age (mean±SD)	38.83±8.47	42.83±10.60
2	Gender: No.(%) male/female	2 (16.66%)/10 (83.33%)	1 (7.69%)/12 (92.30%)
3	Financial Status LIC/MIC/UIC(%)	4(33.33%)/8(66.66%)/0(0%)	5(38.46%)/8(61.53%)/0(0%)
4	Prakriti (constitutional profile)	VP: 7(58%), VK: 5(42%)	VP: 9(69%), VK : 4(31%)
5	Family history of RA	1(8.33%)	3(23.07%)
6	Mean duration of RA in Months	29.08±43.05	37.38±36.59
7	Previuosly took DMARDs	3(25%)	1(7.69%)
8	Previously took steroids	9(75%)	7(53.84%)
9	Tender joint count (TJC) Min. (Mean±SD) Max.	2 (9.75±7.20) 28	3 (10.69±6.28) 22
10	Swollen joint count (SJC) Min. (Mean±SD) Max.	2 (9.33±7.39) 28	3 (9.46±5.81) 22
11	Patient's global assessment of disease activity. Min. (Mean±SD) Max.	6 (7.96±1.10) 9	5 (8.08±1.40) 9.5
12	Provider's global assessment of disease activity. Min. (Mean±SD) Max.	4 (7.38±1.46) 9	4 (7.79±1.67) 10
13	ESR Min. (Mean±SD) Max.	14 (53.17±23.90) 98	13 (36.31±22.74) 82
14	Rheumatoid factor Negative/positive/weakly positive(%)	0(0%)/10(83.33%)/2(16.66%)	0(0%)/8(61.53%)/5(38.46%)

- The disease occurred in majority of females in both groups (83% and 92%). Average age of patients was 38 and 42 years.
- The patients of vata *pittaja prakriti* was suffered more aggressively from disease than the patients of vata *kaphaja prakriti*. Similar results regarding *prakriti* were reported by Kumar N and Kumar A in 1995.[9]
- 1 patient in group A and 3 patients from group B had family history of rheumatism.
- The family history data of patients showed that disease cannot be predicted by genetic factors and environmental factors play major role in etiopathogenesis.
- 75% patients from group A and 53% patients from group B previously took steroids. This is to be noted that patients who has more pronounced history of taking steroid, usually get less benefit from *Ayurvedic* treatment.

RESULTS

Clinical and Physical Parameters for Disablity: Group A (n=12)

Table 2: Clinical And Physical Parameters For Disablity: Group A.

Parameters	Mean±SD (BT)	Mean±SD (AT)	Mean difference	Test statistic	P value*	Interpretation of P value
Morning stiffness duration in minutes.	41.25±17.20	27.5±9.65	13.75	W=78	0.00048	P<0.001 Highly significant
Grip strength in mmHg	72.5±22.61	91.25±21.96	18.75	W=78	0.00048	P<0.001 Highly significant
Foot pressure in Kgs	16.83±2.75	19.08±2.68	2.25	W=78	0.00048	P<0.001 Highly significant
Walking time in secs for 25 feet	15.83±2.62	13.16±2.08	2.66	W=78	0.00048	P<0.001 Highly significant
Weight	63.66±7.26	65.16±7.32	1.5	W=66	0.001	P=0.001 significant

*Wilcoxons signed rank test .

Table 3: Hematological Parameters: Group A (n=12).

Parameters	Mean±SD (BT)	Mean±SD (AT)	Mean difference	Test statistic	P value*	Interpretation of P value
HB g/dl	9.8±0.90	10.1±0.78	0.31	W=58.5	0.0224	P<0.05 significant
TLC/cu-mm	8591.6±1868.62	8308.30±1406.12	283.33	W=44.5	0.323	P>0.05 Insignificant
ESR mmIstHr	53.16±23.91	46.33±21.45	6.83	W=78	0.00048	P<0.001 Highly significant
RA TITRE IU/ml	45.5±27.35	42.25±26.75	3.25	W=68	0.019531	P<0.05 significant
PLT COUNT *10^3/mcL	269.91±59.39	264.16±40.01	5.75	W=50.5	0.39063	P>0.05 Insignificant

*Wilcoxons signed rank test.

Table 4: Parameters of Clinical Disease Activity Index (CDAI): Group A (n=12).

Parameters	Mean±SD (BT)	Mean±SD (AT)	Mean difference	Test statistic	P value*	Interpretation of P value
Tender joint count(TJC)	9.75±7.20	8.25±5.57	1.5	W=33	0.039063	P<0.05 significant
Swollen Joint Count(SJC)	9.33±7.38	6.75±6.03	2.58	W=66	0.00097	P<0.001 Highly significant
Patient global assessment of disease activity(ptGADA)	7.95±1.09	7.16±1	0.79	W=55	0.0019531	P<0.05 Significant
Provider global assessment of disease activity(prGADA)	7.37±1.46	6.62±1.29	0.75	W=66	0.00097656	P<0.001 Highly significant
Total CDAI scores	34.41±16.44	28.79±13.13	5.625	W=78	0.00048828	P<0.001 Highly significant

*Wilcoxons signed rank test.

Table 5: Clinical And Physical Parameters For Disablity: Group B (n=13).

Parameters	Mean±SD (BT)	Mean±SD (AT)	Mean difference	Test statistic	P value*	Interpretation of P value
Morning stiffness duration	40.38±17.73	25.38±12.49	15	W=91	0.00024414	P<0.001 Highly significant
Grip strength in mmHg	70.76±23.61	93.84±21.52	23.07	W=91	0.00024414	P<0.001 Highly significant
Foot pressure in Kgs	19.30±2.46	21.80±2.52	2.5	W=91	0.00024414	P<0.001 Highly significant
Walking time in secs for 25 feet	14.61±2.10	11.61±1.93	3	W=91	0.00024414	P<0.001 Highly significant
Weight	61.68±8.07	61.23±7.30	0.44	W=55	0.22559	P>0.05 Insignificant

*Wilcoxons signed rank test.

Table 6: Hematological Parameters: Group B (n=13).

Parameters	Mean±SD (BT)	Mean±SD (AT)	Mean difference	Test statistic	P value*	Interpretation of P value
HB g/dl	9.73±1.06	9.93±0.85	0.19	W=64	0.049805	P<0.05 Significant
TLC/cu-mm	9469.23±2739.33	8565.38±1405.84	903.85	W=77.5	0.02124	P<0.05 Significant
ESR mmIstHr	36.30±22.74	28.61±18.14	7.69	W=91	0.00024414	P<0.001 Highly significant
RA TITRE IU/ml	71.47±53.07	60.12±46.57	11.35	W=91	0.00024414	P<0.001 Highly significant
PLT COUNT *10^3/mcL	268.53±59.73	262.61±51.85	5.92	W=47.5	0.90674	P>0.05 Insignificant

*Wilcoxons signed rank test.

Table 7: Parameters of Clinical Disease Activity Index (CDAI): Group B (n=13)

Parameters	Mean±SD (BT)	Mean±SD (AT)	Mean difference	Test statistic	P value*	Interpretation of P value
Tender joint count (TJC)	10.69±6.27	5.69±3.19	5	W=55	0.0019531	P<0.001 Highly significant
Swollen Joint Count (SJC)	9.46±5.81	3.53±2.98	5.92	W=91	0.00024414	P<0.001 Highly significant
Patient global assessment of disease activity (ptGADA)	8.03±1.36	6±1.13	2.03	W=91	0.00024414	P<0.001 Highly significant
Provider global assessment of disease activity (prGADA)	7.57±1.77	5.4±1.14	2.11	W=78	0.00048828	P<0.001 Highly significant
Total CDAI scores	35.5±13.92	20.69±6.81	14.80	W=91	0.00024416	P<0.001 Highly significant

*Wilcoxons signed rank test.

Comparative study between group A (n=12) and group B (n=13)

Table 8: Clinical and Physical Parameters for Disablity of group A and B.

Parameters	Test statistic	P value*	Interpretation of P value
Morning stiffness duration (Mean±SD)	Mann-Whitn U=48.5	0.093948	P>0.05 Insignificant
Grip strength in mmHg (Mean±SD)	Mann-Whitn U=47.5	0.08553	P>0.05 Insignificant
Foot pressure in Kgs (Mean±SD)	Mann-Whitn U=65.5	0.51161	P>0.05 Insignificant
Walking time in secs for 25 feet (Mean±SD)	Mann-Whitn U=64	0.43459	P>0.05 Insignificant
Weight(Mean±SD)	Mann-Whitn U=61.5	0.38198	P>0.05 Insignificant

*Mann Whitney U test.

Table 9: Hematological Parameters group A and B.

Parameters	Test statistic	P value*	Interpretation of P value
HB g/dl	Mann-Whitn U=72	0.75719	P>0.05 Insignificant
TLC/cu-mm	Mann-Whitn U=77	0.96773	P>0.05 Insignificant
ESR mmIstHr	Mann-Whitn U=73	0.79807	P>0.05 Insignificant
RA TITRE IU/ml	Mann-Whitn U=39	0.029957	P<0.05 Significant
PLT COUNT *10^3/mcL	Mann-Whitn U=71	0.72342	P>0.05 Insignificant

*Mann Whitney U test.

Table 10: Parameters of Clinical Disease Activity Index (CDAI) of group A and B.

Parameters	Test statistic	P value*	Interpretation of P value
Tender joint count(TJC)	Mann-Whitn U=41.5	0.043799	P<0.05 Significant
Swollen Joint Count(SJC)	Mann-Whitn U=28	0.0045107	P<0.05 Significant
Patient global assessment of disease activity(ptGADA)	Mann-Whitn U=9	0.0001	P<0.001 Highly significant
Provider global assessment of disease activity(prGADA)	Mann-Whitn U=22	0.00081111	P<0.001 Highly significant
Total CDAI scores	Mann-Whitn U=20	0.0008936	P<0.001 Highly significant

*Mann Whitney U test.

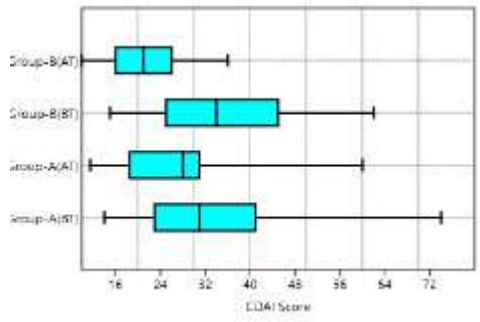


Figure 1: Group wise pre and post CDAI Scores.

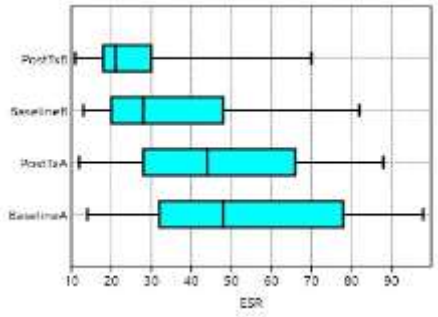
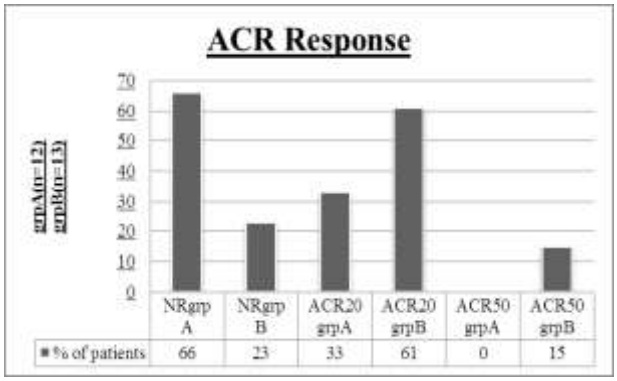


Figure 1: Boxplot Chart of ESR of Both Groups.

ACR Response of Both Groups



In group A there were 66% patients who could not satisfy ACR 20 response category and thus categorised as Non-responders despite of any changes in their endpoints. There were 33% patients in group A who fall under ACR 20 response category. None of the patients in group A satisfied ACR 50 response criteria. In group B, 61% patients satisfied ACR20 response criteria and 15% patients satisfied ACR 50 response criteria whereas 23% of patients in group B came under category of Non-responders.

NRgrpA: non responders in group A

NRgrpB: non responders in group B

ACR20grpA: patients from group A satisfying ACR 20 criteria.

ACR20grpB: patients from group B satisfying ACR 20 criteria.

ACR50grpA: patients from group A satisfying ACR 50 criteria.

ACR50grpB: patients from group B satisfying ACR 50 criteria.

DISCUSSION

75% patients from group A and 53% patients from group B previously took steroids. This is to be noted that patients who has more pronounced history of steroid use usually benefit less from ayurvedic treatment. A study on evaluation of overall ayurvedic formulations in rheumatoid arthritis showed that the progress of the steroid group was slower than those who

were not on steroids. The average length of treatment was 3 months for the nonsteroid group compared with 6 months for steroid group.[10] The family history data of patients showed that disease cannot be predicted by genetic factors and environmental factors play major role in etiopathogenesis.

Effect of trial drug and *Erand tail*

- The duration of morning stiffness in both groups decresed significantly (P<0.001) from mean duration of 41.25±17.20 to 27.5±9.65 in group A and 40.38±17.73 to 25.38±12.49 in group B. there was no significant difference in both drugs on morning stiffness and both drugs were equally effective.
- The grip strength was measured by inflating BP cuff pressure upto 20 mmHg in patient was asked to press it with hands. It was incresed in both groups from 72.5±22.61 to 91.25±21.96 in group A and 70.76±23.61 to 93.84±21.52 in group B. Both the drugs were able to highly significantly increase grip strength (P<0.001) and were equally effective.
- Foot pressure was also changed significantly in both groups and both drugs were equally effective. In group A foot pressure incresed from 16.83±2.75 to 19.08±2.68 and in group B, 19.30±2.46 to 21.80±2.52.
- There was highly significant improvement in walking time pre and post treatment in both groups and both drugs were equally significant. In group A walking time decreased from 15.83±2.62 to 13.16±2.08 and in group B 14.61±2.10 to 11.61±1.93.
- In group A weight of patients significantly increased from 63.66±7.26 to 65.16±7.32. patients of group A reported increased weight and increased appetite. This may be due to digstion of ama by drugs and strengthening of digestive power in contrast patients of group B reported decrease in weight which was clinically insignificant. Decrease in weight may be the effect of *nitya virechan* done by *Erand tail*.

Effect of trial drug and Erand tail on Hematological parameters

- Both groups had significant (p<0.05) increase in Hb and both drugs were equally effective. Hb is an indicator of general health and in general there is chronic anemia in late rheumatoid arthritis. Increase in Hb signifies the positive effect of both drugs in disease course. In group A, Hb incresed from 9.8±0.90 to 10.1±0.78 and in group B, Hb increased from 9.73±1.06 to 9.93±0.85.

- Group A showed insignificant change in TLC but group B showed significant decrease in TLC from 9469.23±2739.33 to 8565.38±1405.84. but this change is clinically insignificant and both groups insignificantly varried on changes in TLC.
- Both groups had insignificant difference in decreasing ESR of the patients but were significantly effective in decreasing the ESR. Group A showed mean difference of 6.83 in ESR pre and post treatment whereas group B showed a net mean difference of 7.69 pre and post treatment. ESR is first and most important proof of efficiency of any intervention and highly specific indicator of disease activity.
- In measurement of RA titre, group B showed more significant ($P<0.05$) reduction as comapred to group A. There was a significant change (from 45.5±27.35 to 42.25±26.75) in group A whereas there was highly significant change (from 71.47±53 to 60.12±46.57) in group B. It is evident here that RA titre is more efficiently decreased by Erand tail by purgation and *shodhan* process which further proves that *ama dosh* plays major role in the etiology of disease. It also proves superiorty of *pachkarma* and *shodhan* process in controlling the disease.
- Both the groups showed insignificant change in platelet counts and both drugs did not differ in their effect on platelet count.

Effect of trial drug and Erand tail on Clinical disease activity scores (CDAI)

The CDAI is a composite index used to report change in clinical disease actuvity. Other composite indices are DAS, DAS28 and SDAI. These indices are easy to use and produce reliable clinical data in research as well as clinical practice.

Effect on tender joint count (TJC)

The trial drug in group A resulted in significant decrease ($P<0.05$) in tender joint count with a mean difference of 1.5 whereas Erand tail in group B resulted in highly significant ($P<0.001$) decrease in with a mean difference of 5. This proves superiority of *Erand tail*($P<0.05$) in decreasing tenderness in joints.

Effect on swollen joint count

Both the drugs decreased swollen joint count with a mean difference of 2.58 in group A vs 5.92 in group B both of these differences were highly significant. This also proves that *Erand tail* is significantly ($P<0.05$) better than trial drug in decreasing swollen joint count.

Effect on patients' global assessment of disease activity

Erand tail proved to be better than trial drug in patients' global assessment of disease activity with a highly significant difference. Both drugs were successful in decreasing this parameter with mean difference of 0.79 (P<0.05) in group A in contrast to 2.03(P<0.001) in group B. This means that the patients were more satisfied with *Erand tail* treatment.

Effect on providers' global assessment of disease activity

Both the groups showed highly significant difference (0.75 in group A vs 2.11 in group B) in this parameter but *Erand tail* treated group showed more difference as compared to trial drug group. This means that physician was also more satisfied with *Erand tail* treatment.

Effect on total CDAI scores

There was highly significant change in CDAI scores of both groups with a mean difference of 5.625 in group A vs 14.80 in group B. The Erand tail group was found to be superior in decreasing total CDAI scores with a highly significant difference over trial drug.

Among the three clinical complaints of pain, swelling and tenderness there was noted a pattern of disappearance of complaints in which pain was subsided at starting then swelling decreased and tenderness disappeared at last.

During trial study it is found that small joints improved first and large joints took more time to improve. It is also observed that wrist joint was almost always involved in all patients and shows universal involvement of wrist. Involvement of joints was symmetrical in chronic cases but asymmetrical in acute cases and cases treated by DMARDs. The Interview of the patients suggested that onset of the disease was related to change in diets and habits.

The Trial drugs and their probable mode of action

The trial drugs (*Nirgundi, Haridra, Marich* and *Sireesh*) are *katu, tikt ras* and *teekshan gun* dominating drugs having *ushan veerya*. These are frequently indicated for the treatment of *Amavat*.[11]

Due to their *Tikt* and *katu ras,* these drugs possess antagonistic properties to *ama* and *kapha* which are causative of this disease[12] and *tikt* and *katu* ras also increases digestive power which digests *ama* and reduces excessive production of *kapha* and *tikshan guna* helps to open obstructed *srotas*. Because of and *ushan veerya* these drugs alleviate vitiated *vata dosh* decreasing pain in joints. Thus trial drugs are effective on both *ama* and *vata* for controlling

the disease. The anti toxin properties of these drugs collectively work on reduction of *ama vish* from body.

The *Erand tail* (Group B drug) and probable mode of action

The *Erand tail* was choosen for comparison of trial drug because in *Ayurved, Erand tail* is established as highly effective in treatment of rheumatoid arthritis. *Bhavpraksh, Madanpal* and *Kaidev nighantu* indicated *Erand tail* in *amavata.*[13,14,15] By virtue of its *ushan veerya* and *snigdha guna* it alleviates vitiated *vata dosh*. *Tikt* and *katu ras* helps in digestion of *ama dosh* and being a purgative (*virechaniye*) by its *prabhava*, it pulls out *ama dosh* from body and alleviating *vata dosh* simultaneously. It exerts its action by two ways firstly systemic effect on inflammation due to its anti inflammatory properties and secondly sudden effect on pain and inflammation after purgation.

A study found efficiency of castor oil and diclofenac sodium comparable in treatment of osteoarthritis but castor oil had lesser side effects.[16]

CONCLUSIONS

Amavata (rheumatoid arthritis) is a chronic progressive disease which is hard to control and leads to disabilities in absence of effective treatment. The *vishaghna dravayas* are effective in controlling the symptoms of *amavata*, decreasing acute phase reactants and improving lifestyle of the patients. *Erand tail* is more effective than the *vishaghna dravyas* in controlling the symptoms of *amavata*. If we take into consideration *desh, kala, deh-manasik bal* etc, pretreatment purification (*shodhan*) process, *sama* or *nirama avastha* for status of *ama dosh* in the body, results would be better in the treatment of Amavata. We also conclude that patients of *vata-pittaja prakriti* suffer more aggressively from RA, hence these patients should avoid pitta vitiating food and habbits along with strict diet regime and exercises as recommended by physicians.

REFERENCES

1. Aletaha, D., Neogi, T., Silman, A. J., Funovits, J., Felson, D.T., Bingham, C.O., Birnbaum, N.S., Bykerk, V.P., Cohen. M. D., Combe, B., Costenbader, K.H., Dougados, M. *et al.* Arthritis & Rheumatism. *Arthritis & Rheumatism*, 2010; 62(9): 569–2581.
2. American college of rheumatology committee to reevaluate improvement criteria. A Proposed Revision to the ACR20: The Hybrid Measure of American College of

Rheumatology Response. *Arthritis & Rheumatism (Arthritis Care & Research)*, 2007; 57: 193–202.

3. Aletaha D, Smolen J: The Simplified Disease Activity Index (SDAI) and the Clinical Disease Activity Index (CDAI): a review of their usefulness and validity in rheumatoid arthritis. Clin Exp Rheumatol, 2005; 23(5 Suppl. 39): S100-S108.
4. Murthy, K.R.S (Ed.). *Madhava Nidana Rog Vinishchya.* Chaukhamba Orientalia. Varanasi, 95.
5. Kasper, D.L., Fauci, A. S., Hauser, S.L., Longo, D.L., Jameson, J.L., Loscalzo, J. *Harrison`s principles of Internal medicine*. New York: McGraw Hill Education Medical, 2001; 2.
6. Charak Samhita by Agnivesha Vsidyamanorama Hindi Commentary Edited by Acharya Vidhyadhar Shukla and Prof. Ravi Dutt Tripathi. Dehli: Choukhambha Sanskrit Pritishthan, 73.
7. Murthy, K.R.S (Ed.). Sharangadhara Samhita. Varanasi, Chaukhamba Orientalia, 20.
8. Bhavaprakash. *Bhavprakash Samhita: Madhyam Khand:AmavataAdhikar*. Retrieved from http://vedicreserve.mum.edu/bhava_prakash_samhita.htm.
9. Kumar, N. and Kumar, A., An applied aspect of rheumatoid arthritis: an ayurvedic approach, *J. Res. Ayurveda Siddha*, 1995; 16: 134.
10. Krishna, K.P.R. The efficacy of *Ayurvedic* treatment for rheumatoid arthritis: Cross-sectional experiential profile of a longitudinal study. *Int J Ayurved Res*, 2011; 2(1): 8–13.
11. Chuneker K.C. (Ed.) *Bhavaprakasa Nighantu*. Varanasi, Chaukhambha Bharti Academy.
12. Murthy, K.R.S (Ed.). *Madhava Nidana Rog Vinishchya.* Varanasi, Chaukhamba Orientalia, 2010; 95-96.
13. Chuneker K.C. (Ed.). *Bhavaprakasa Nighantu*. Varanasi, Chaukhambha Bharti Academy, 2010; 286-288.
14. Shastry, J.L.N. (Ed.) *Madanpal Nighantu*. Varansi, Chaukhamba Orientalia, 65.
15. Sharma P.V. and Sharma G.P (Ed.). *Kaideva Nighantu*. Varansi, Chaukhamba Orientalia, 2006; 24-25.
16. Medhi, B., Kishore, K., Singh, U. and Seth, S.D. Comparative clinical trial of castor oil and diclofenac sodium in patients with osteoarthritis. *Phytother Res*, 2009; 23(10): 1469-73.