Research Article

Management of Rheumatoid Arthritis *(Amavata)* with Herbo-mineral formulation - A clinical study

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Abstract

Rheumatoid Arthritis (R.A) is a chronic, progressive and disabling auto-immune disease that causes chronic inflammation of the joints. It makes life miserable and crippling due to unknown cause, claiming the maximum loss of human working capacity. The polyarticular joint disease has been described in *Ayurveda* has high resemblance with Rheumatoid arthritis in modern medicine. The disease draws attention for the consideration of research firstly due to the gravity of the problem and secondly due to lack of adverse free modern drugs for the treatment of R.A. Hence the present study has been taken up to see the efficacy of a combination of herbomineral drugs i.e *Sunthi, Guggulu* and *Godanthi bhasma* (1:2:1 ratio) on 71 cases of *Amavata (*R.A). The study observations showed that the overall treatment response among the cases studied, 10 (15%) cases showed good response, 20 (30%) cases showed fair response, 33 (49%) cases showed mild response and 4 (06%) patients did not show any response and rest 4 cases were dropouts. There was a significant improvement in loss of appetite, anorexia, fever in *amavata* patients after treatment. Statistical analysis of the mean difference before and after treatment in relief on all the above symptoms except in sub cutaneous nodules and erythrocyte sedimentation rate (ESR), were found highly significant (P<0.0001). It was also observed a definite improvement and subjectively maximum patients had a feeling of well-being. No side effects were reported during and after the treatment.

Key words: Rheumatoid Arthritis, *Amavata*, Herbo-mineral drugs, *Ayurveda*

Introduction

Rheumatoid arthritis (R.A) is a chronic multisystem disease of unknown aetiology (1).It is a systemic disorder characterized by chronic inflammatory synovitis involving mainly the peripheral joints (2).The disease apparently has no racial or ethnic discrimination. However, females are affected approximately three times more often than men. There is symmetrical synovitis, with arthralgia, stiffness and swelling and if prolonged destruction of peripheral joints (3). About 1% of the world's population is afflicted by rheumatoid arthritis. Onset is most frequent between the ages of 40 and 50, but people of any age can be affected. Although the cause of rheumatoid arthritis is unknown, non-specific autoimmunity plays a pivotal role in both its chronicity and progression (3).

The polyarticular joint disease, Rheumatoid arthritis clinical symptoms has high resemblance with "*Amavata***"** described in *Ayurveda.* The word '*Ama*' means toxic material generated as a un wholesome product in the body, due to weakening of digestive fire. This '*Ama*' is

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then carried by '*Vayu*' and travels throughout the body and accumulates in the joints, which is the seat of '*Kapha*'. As this process continuous, all the joints are gradually affected, which results in severe pain and swelling in the joints (4).

In conventional medicine, R.A is typically treated with the synthetic drugs may induce remission. The non-steroidal, anti-inflammatory drugs (NSAIDs) still form the mainstay of drug therapy for rheumatic diseases. They do not cure or permanently reverse the inflammatory process, but by reducing pain, swelling, stiffness, and they improve function and give considerable symptomatic relief. On the other hand, all have potentially adverse effects.

However, in *Ayurveda* the principal treatment of *Amavata* (R.A) is more or less etiologically oriented. Since the gastro intestinal sluggishness leads to indigestion and malabsorption is attributed to the cause of this disease, the correction of gastro intestinal hypo function is first line of treatment to reduce the further damage to the tissues. The line of treatment is described as *langhana, deepana, ama pachana* and *Vatanulomana* along with the *vata shamaka* drugs which acts as anti inflammatory and analgesic action (5).

The CCRAS is incessantly engaged in finding out a safe with better efficacious and affordable treatment with suitable herbal and herbomineral drugs for *Amavata* (R.A).Clinical trials on *Sunthi* and *Guggulu* was carried out by the council and the results were found promising (6). Literature review shows that, an ethanolic extract of the rhizomes of *Zingiber officinale* was investigated for anti-inflammatory, analgesic, antipyretic, activities in mice and rats showed significant effect(7)ʾ *Zingiber officinale* was also evaluated for its anti-inflammatory activity (8). A dose-dependent inhibition of prostaglandin release effect was observed and was also reported that ginger extract inhibits the

cyclooxygenase and 5-lipoxygenase enzymatic pathways which leads to the regulation of prostaglandin and leukotriens biosynthesis (9).

Guggulu (Commiphora mukul) has been evaluated for anti arthritic and anti inflammatory actions (10,11). This effect was also been demonstrated and it has significant anti-inflammatory and antiarthritic activity in the animal experiments (12,13).

But to potentiate additional analgesic action of the combination of *Sunthi* and *Guggulu of council's earlier studies,* G*odanthi* bhasma (*CaSO$_4$, 2H2O*), the third component of a mineral origin drug was added. *Godanthi bhasma* possess the pharmacodynamic properties of *agnideepana* (digestive), *jwarahara* (antipyretic), *pitta shamaka* (pacify the pitta dosha),*balya* (energetic),*sulahara* (analgesic) and also *asthi poshaka* (calcium supplementary)(14) and the study was planned for trial on 71 established cases of *Amavata* (RA) and the results are reported.

Materials and methods:

A total number of 71 established cases of *Amavata* were selected for this study from the OPD of Regional Research Institute (Ayurveda), Mandi (H.P) during 2001-2004.Clinical, pathological and biochemical investigations carried out as per the proforma and results assessed according to the assessment criteria.

- **Inclusion criteria** :
  1. Age between 12-60 years of either sex
  2. Chronicity between 6 weeks to 5years
  3. Morning stiffness
  4. Arthritis of 3 or more joints
  5. Arthritis of hand joints
  6. Symmetrical joints swelling
  7. Subcutaneous nodules over bony prominences (Rheumatoid nodules)

8. Typical X ray changes which must include erosions or bony decalcification localized in or adjacent to involved joint
9. Positive test for RA factor (latex fixation test)

- **Criteria of Exclusion:**
1. Age below 12 years and more than 60 years
2. Chronicity less than 6 week and 5 years
3. Gout
4. Osteo arthritis
5. Gonorrhoeal arthritis/syphilitic arthritis
6. Tubercular arthritis
7. Arthritis with malignancy
8. Acute pyogenic arthritis
9. Psoriatic arthritis
10. Osteomyelitis
11. Rheumatic fever
12. Ankylosing spondylitis
13. Arthritis with serious complications
14. Bursitis
15. Osteoporosis
16. Diabetes arthritis

Preparation of trial drug:

Rhizomes of *Sunthi* (*Zingiber officinale Roxb.*) 500mg, Exudate of *Guggulu* (*Commiphora wighti (Arn.) Bhand.*)1000mg and *Godanti bhasma* (*CaSO₄, 2H2O*) 500mg were mixed in 1:2:1ratio. *Guggulu* and *Godanti* were taken in purified form.

Dose schedule: Sunthi-500mg, Gugulu-1000mg, Godanti-500mg three times daily, oral administration with luke warm water for 6 weeks to assess the improvement on every 15 days follows up.

Assessment criteria:
The assessment was done in respect of subjective and objective improvement in every follow up on the basis of scoring in their category as mentioned in Table.1. The overall treatment response was done on the basis of response above 75%, 50% and 25% and less than 25% are good, fair, poor and no response respectively.

Level of study was OPD; type - Single blind trial

Criteria for establishment of diagnosis of disease
Data were collected to commencing the therapy and also periodically as per the criteria described below.

Table1.Clinical symptoms assessment grade with scoring

Subjective	Grade with score				
Morning stiffness	Severe:6	Moderate:4	Mild:2		
Pain on rest	Severe:9	Moderate:6	Mild:3		
Objective					
Pain on motion	Severe:9	Moderate:6	Mild:3		
Swelling	Severe:15	Moderate:10	Mild:5		
Tenderness	G4:20	G3:15	G2:10	G1:5	
Muscle power	G0:10	G1:8	G2:6	G3:4	G4:2	G5:0
Restricted movements	Fully restricted:6	Partially restricted:3	No restriction:0		
Sub cutaneous nodules	Present:2	Absent:0			
Functional status	Grade 4:6	Grade 3:4	Grade 2:2	Grade 1:0	
Fever	Present:2	Absent : 0			
ESR (1ˢᵗ hour)	71mm or more: 6	41mm to 70 mm: 4	20mm to 40 mm: 2	0 mm to 20 mm: 0	

Digestive impairment			
Constipation	Regular:3	Frequently:2	Occasionally:1
Loss of appetite	Appetite lost:2	Poor appetite:1	Normal appetite : 0
Anorexia	No inclination for diet:2	Less inclination for diet:1	No anorexia : 0
Loose motion	Present:2	Absent : 0	

Observations and Result:

It was observed that females were more affected than males. The incidence ranging from 46-55 years of age were more followed by 36-45 (Table 2, Fig.1).

Table 2. Incidence of Age and Sex

Age in years	Male	Female	Total	percentage
12-16	0	0	0	00%
17-25	3	0	3	04%
26-35	3	12	15	21%
36-45	9	13	22	31%
46-55	10	15	25	35.5%
56-60	2	4	6	08.5%
	27 (38%)	44(62%)	71	100%

Table 3. Duration of illness

S.No	Duration of illness	No.of Pts		Total	Percentage
		Male	Female		
1	6wks to < 1 year	13	25	38	53.5%
2	1-2 yrs	9	8	17	24%
3	2-3	5	8	13	18%
4	3-4	0	2	02	2.82%
5	4-5	0	1	01	1.41%
6	Above 5 yrs	0	0	00	00
	Total	27 (38%)	44(62%)	71	100%

It was observed that patients between 6 weeks to below 1 year duration were more affected compared to other categories (Table3, Fig2.)

Table 4. Educational status

Educational status	No.of patients	Percentage
Illiterate	13	18%
Read &Write	00	00%
Primary school	08	11.3%
Middle school	06	8.45%
High school	26	37%

Higher studies	18	25%
	71	100%

Number of high school educated persons was more affected than others (Table 4).

Table 5.Diet wise distribution

Nature of Diet	No.of patients	Percentage
Vegetarian-	25	35.2%
Non Veg. diet	38	53.5%
Lacto ova	08	11.3%
Total	71	100%

The disease was found to be more susceptible in patients having non vegetarian diet along with irregular bowel habits (Table 5&6, Fig3&4).

Table 6. Bowel habits

Bowel habits	No.of patients	Percentage
Regular	21	30%
Constipation	50	70%
Total	71	100%

Table 7. Occupation wise distribution

Occupation	No.of patients	Percentage
Desk work	19	27%
House wife	34	48%
Field work	15	21%
Business	03	04%
Total	71	100%

According to occupation house wives were found more affected than other categories (Table 7).

Table 8. Distribution of Prakriti

Shareera prakriti	No.of patients	Percentage
Vataja	03	04.2%
Pittaja	04	05.6%
Kaphaja	09	13%
Vata pittaja	02	12.67%
Vatakaphaja	42	59.15%
Pittakaphaja	11	15.49%
Total	71	100%

As far as body constitution is concerned, vatakaphaja prakriti persons were more susceptible to the disease (Table 8, Fig. 5)

Table 9. Statistical analysis on the effect of treatment on clinical parameters of Amavata patients [N=67]   [D.F=66]

Clinical parameter	Before Treatment		After Treatment		t value	p value	Significance
	Mean ± SD	SEM	Mean ± SD	SEM			
Morning stiffness	3.73±1.30	0.16	1.16±1.16	0.14	23.13	<0.0001	Highly significant
Pain on rest	4.88±2.14	0.26	1.97±2.12	0.26	26.47	<0.0001	Highly significant
Pain on motion	5.60±2.15	0.26	2.51±2.19	0.27	24.30	<0.0001	Highly significant
Swelling	6.94±3.37	0.41	2.69±3.41	0.42	19.41	<0.0001	Highly significant
Tenderness	10.52±5.09	0.62	5.15±4.44	0.54	24.33	<0.0001	Highly significant
Muscle power	4.96±2.18	0.27	2.66±2.01	0.25	23.61	<0.0001	Highly significant
Restricted movements	3.72±1.29	0.16	1.03±1.44	0.18	23.78	<0.0001	Highly significant
Sub cutaneous nodules	0.87±1.00	0.12	0.69±0.96	0.12	2.55	p=0.013	significant
Functional status	3.76±1.50	0.18	1.73±1.47	0.18	68.00	<0.0001	Highly significant
Fever	0.63±0.93	0.11	0.18±0.58	0.07	4.36	<0.0001	Highly significant
Loss of appetite	1.16±0.37	0.05	0.27±0.45	0.05	20.71	<0.0001	Highly significant
Anorexia	3.72±1.29	0.16	1.03±1.44	0.18		<0.0001	Highly significant

S.D-Standard deviation; S.E.M-Standard error of mean; D.F-Degree of freedom
Statistical analysis of the mean difference before and after treatment in relief on all the above symptoms and Erythrocyte sedimentation rate (ESR) were found highly significant (P<0.0001) except in sub cutaneous nodules (Table 9&10).

Table 10. Effect on ESR in patients of Amavata (N=67)

Clinical parameter	Before Treatment		After Treatment		t value	p value	Significance
	Mean ± SD	SEM	Mean ± SD	SEM			
E.S.R	4.00±0.92	0.11	2.24±0.82	0.10	15.11	<0.0001	Extremely significant

Table 11. Treatment effect on RA factor in patients of Amavata (N=67)

Rheumatoid Arthritis factor			
Before treatment (positive)		After treatment	
No.of Pts	percentage	Positive cases (%)	Negative cases (%)
28	41.8%	18 (26.87%)	10 (14.93%)

Before treatment RA test was positive in 28 cases, while after the treatment 10 cases became negative and 18 cases remained positive (Table.11).

Table 12. Result of treatment (n=67)

Response	No.of patients	percentage
Good Response	10	15%
Fair Response	20	30%
Poor Response	33	49%
No Response	04	06%
Total	67	100%

Drop outs=04

The overall treatment responses among the cases studied were as follows: 10 (15%) cases showed good response, 20 (30%) cases showed fair response, 33 (49%) cases showed mild response and 4 (06%) patients did not show any response and rest 4 cases were dropouts (Table 12,Fig.6).

DISCUSSION

Rheumatoid arthritis is a complex and variable condition from the point of view of severity. It is usually a "painful nuisance" for which treatment needs to be individualized with optimum dosage of safe, effective and affordable herbomineral drugs i.e rhizomes of *Sunthi* (*Zingiber officinale Roxb*.), exudates of *Guggulu* (*Commiphora wighti (Arn.) Bhand.*) and *Godanthi bhasma* ($CaSO_4, 2H2O$) having digestive, analgesic, antipyretic and anti-inflammatory properties. As per the scientific observations of the selected drugs and also on the basis of *ayurvedic* line of treatment, the study was aimed at effective control of symptoms without any adverse effects.

In the present study, it was noticed that pain, restricted movements, pain of joints were more in the morning, Metacarpo phalengeal (MCP), wrist and knee joints were more affected. Anorexia, loss of appetite, indigestion and irregular bowels were the common complaints.

The main objective of this trial is to evaluate the efficacy of *Sunthi, Guggulu* and *Godanthi* (1:2:1) in controlling the clinical symptomatology of *Amavata* (R.A). The standard criteria have been used for diagnosis and certain functional tests have also been done for objective evidence. Laboratory parameters like ESR and RA factor have been carried out before and after treatment.

The observations were done on the basis of age and sex wise distribution of data which clearly showed that the incidence of RA is more prone in females with the age group of 36-55 years. Most of the *amavata* patients were having the history of faulty dietary habits with sedentary life style leads to hypofunction of *jatharagni* and thus help in pathogenesis of *Amavata* (R.A). It was observed that more number of cases showed irregular bowel habits or constipation, which is a major causative factor of *Amavata*. In regards to body constitution, *vatakaphaja prakriti* patients (59.15%) were more affected the disease. Clinical symptoms like morning stiffness, pain and restricted joint movements were seen in all the patients. Digestive impairment with loss of appetite, anorexia, indigestion etc was noted in maximum patients, which appear due to the nature of *amadosha* of *Amavata*. There was significant reduction in clinical symptomatology i.e *sandhi sula* (pain) *sandhi sotha*(swelling) and *sandhi stabdata* (stiffness of joints) due to its digestive, carminative properties of trial drugs, result in inhibition of formation of *Ama* (toxic substance) and also alleviation of *vata* and *kapha dosha*. In spite of this, a

definite improvement was also noted and subjectively maximum patients had a feeling of well-being. No side effects were reported during and after the treatment.

CONCLUSION

Based on study observations, it may conclude that, the selected trial drugs may have better approach and scope in successful management of Rheumatoid arthritis *(Amavata)*.Clinical symptoms like pain, swelling morning stiffness etc were best-controlled and significant improvement was noticed in digestive impairment. Besides, a definite improvement was noted and subjectively maximum patients had a feeling of well-being. The combination of *Sunthi, Guggulu* and *Godanthi* is a balanced and judicious formulation, which synergistically acts in breaking the complex of pathogenesis of the disease Rheumatoid arthritis *(Amavata)*. Besides, the mineral drug *Godanthi*, a natural purified calcium supplement plays an important role in bone nourishment. No side effects were reported during and after the treatment.

References:
1. P.E. Lipsky, Harrison's Principle of Internal Medicine,ed.by WisonJD,Braunwald E;published by McGeaw-Hill.Inc.,New York,15th ed,chapter-312; 2001, 1928-1936.
2. Kumar P & Clark M, Clinical Medicine, published by W B Saunders, London, 4th ed., chapter 8 (Rheumatology and Bone diseases); 1999, 447-518.
3. Chandrasekharan AN, API Textbook of Medicine, ed.Sainani GS published by Association of Physicians of India, Mumbai, 5th ed., Section XVI, chapter 4 (Rheumatology); 1992, 1118-1121.
4. Murthy KRS, Madhava Nidanam of Madhavakara, Varanasi Choukambha Orientalia; 1987, Ch.25/1-12.
5. Ambikadatta sastry, Bhaishajyaratnavali of Govindadasa, 14th edn, Varanasi,Choukambha Sanskrit Sansthan; 2001
6. Prem Kishore et.al. "Clinical studies on the treatment of Amavata (Rheumatoid arthritis) with sunthi-guggulu", JRAS.Vol.III; 3-4; 1982: 133-146.
7. Srivatsava KC and Mustafa T et. al. "Ginger (Zingiber officinale) in rheumatism and musculoskeletal disorders", Med Hypothesis; 1992, 39(4):342-348.
8. Mascolo N, Jain R, Jain SC& Capasso F et al., "Ehnopharmacologic investigation of ginger (Zingiber officinale)", J Ethnopharmacol; 27(12); 1989:129-40
9. Kuchi F, Iwakami S, Shibuya M et al, "Inhibition of prostaglandin and leukotrine biosynthesis by gingirols and diarylheptanoids", Chem Pharm.Bull.(Tokyo) 40(2); 1992: 387-391.
10. Satyavati, GV et al., "Commiphora mukul Engl.and Tinospora cordifolia Willd. A study of anti inflammatory activity", Rheumatism, Vol.4; 1969: 141.
11. Bhattacharya, C et al.,"Guggulu and Rheumatic disease", Rheumatism,Vol.11; 1975: 16.
12. Gujral, ML, Saxena PN et al., "An experimental investigation of antiarthritic effect of some indigenous and modern medicine". Ind.Jour.Med.Res.Vol.44; 1956:657.
13. Gulati,OP et.al., "Anti inflammatory activity of Guggulu in white rats".Rheumatism.Vol.8; 1972: 83.
14. Sadananda Sharma, Rasatarangini, 11th edn., Varanasi; Chaukhambha Sanskrit Bhavan; 1994.

15. Nadakarni, K.M, Indian Meteria Medica, Vol.II, 3rd revised edn, Bombay; Popular Prakashan pvt.Ltd; 1982.

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Fig.1 Distribution of cases according to age and sex N=71

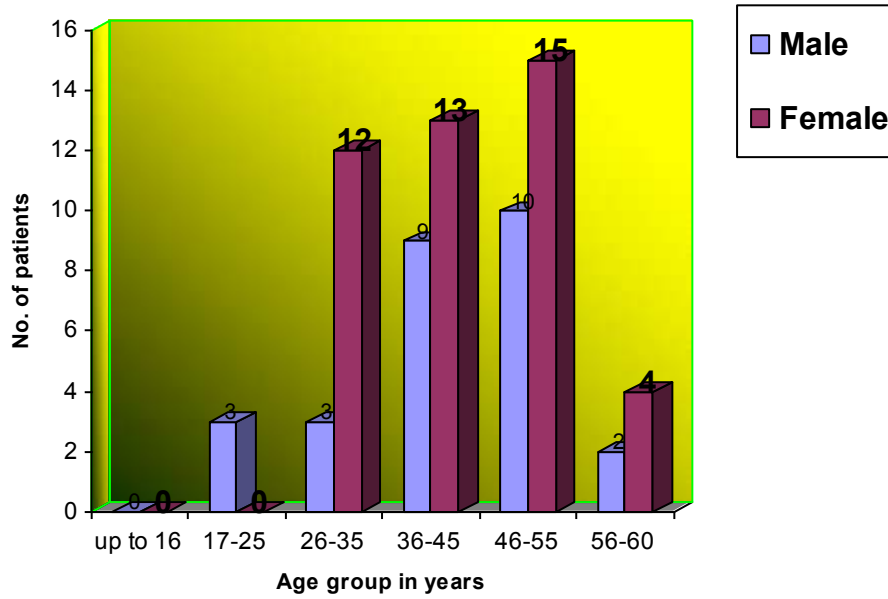Fig.1 Distribution of cases according to age and sex N=71

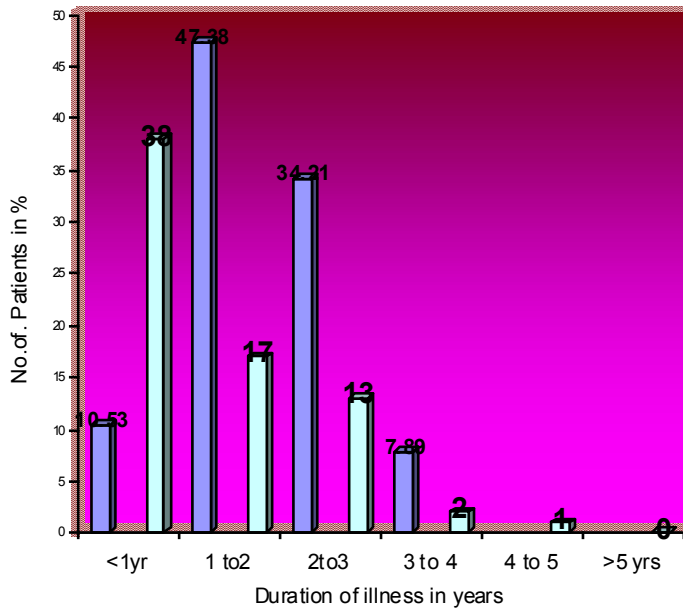Fig.2.Distribution of cases according to duration of disease N=71

Fig3.Diet wise distribution
N=71
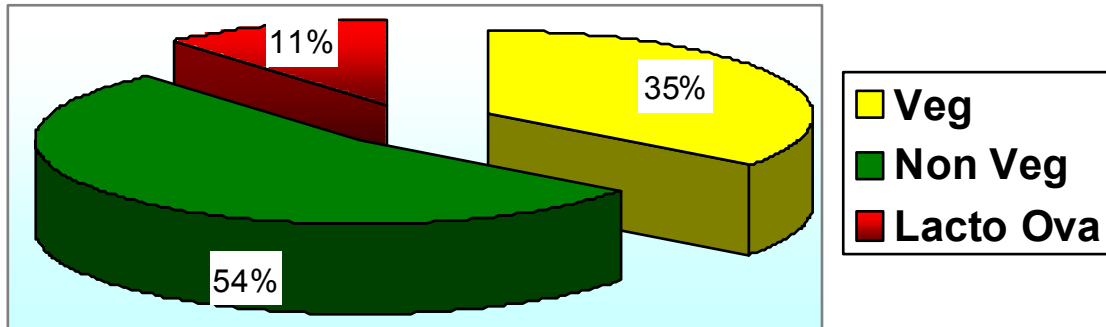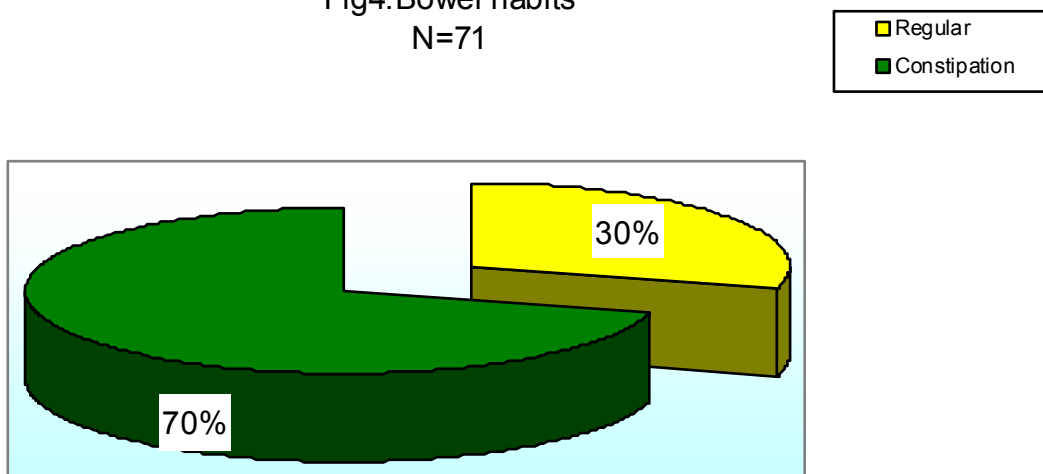

Fig4.Bowel habits
N=71

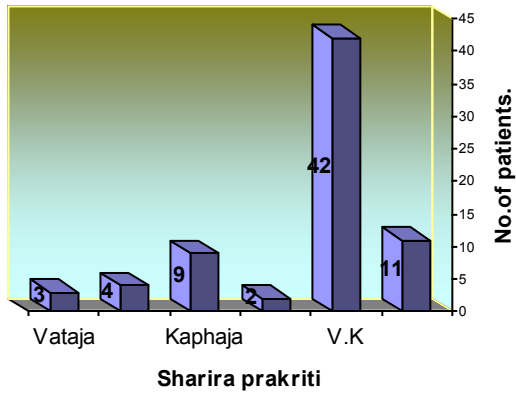**Fig.5. Distribution of patients acc. to incidence of *Sharira Prakriti***

Sharira prakriti

Fig 6. Treatment response in Amavata patients

N=67