iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** VIII **Month of publication:** Aug 2023

DOI: https://doi.org/10.22214/ijraset.2023.55289

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue VIII Aug 2023- Available at www.ijraset.com

A Comparative Clinico-Pathological Study on CRP Positive Patients W.S.R. to Amavata (Rheumatoid Arthritis) and it's Management with Vatari Guggulu and Pathyadi Churna

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Abstract: ***Introduction- C-Reactive Protein (CRP) is an acute-phase of inflammatory protein, a highly conserved plasma protein that is named for its reaction with the capsular C-polysaccharide of Pneumococcus.[1] It is an Annular (Ring-shaped) Pentameric protein found in blood plasma, whose circulating concentration rise in response to inflammation and of hepatic origin that increases interleukin-6 secretion by macrophages and T-cells.[2] Due to this type of inflammatory changes there are stiffness, Pain, Swelling of joints along with generalized symptoms of fever etc. present in the disease like Amavata (Rheumatoid Arthritis).***
Materials and methods- 30 patients of Group-A (15) and Group-B (15) patients were registered from OPD and IPD of Govt. Ayurvedic College & Hospital, Balangir presented with Subjective Parameter as Sandhi Ruja, Sandhi Shotha, Sandhi Stabdhata, Jwara, Aruchi and Daurbalya and Objective Parameter as CRP>6mg/L, ESR, Hb%, DLC,TLC and Lipid profile test. After diagnosis they were under trial with Ayurvedic formulations of Vatari guggulu given 500mg thrice daily after food in Group A and Pathyadi Churna given 5gm twice daily after food with ushnajala for a period of 30 days with respectively. The subjective and objective parameters were assessed in 10 days interval to interpret the result by statistical evaluation.
Observation and results:- It has been observed that the result of trial drug Group-A patients is Significant ($p<0.05$) to reduce both Subjective and Objective parameter after 30 days of treatment as campair to Group-B patients.
Conclusion- CRP positive patients suffered from Amavata (Rheumatoid Arthritis) showed Significant improvement after receiving the Ayurvedic formulation 'Vatari Guggulu' in this study. No adverse effect was observed.
Keywords: CRP, Amavata, Rheuatoid Arthritis, Vatari Guggulu, Pathyadi Churna

I. INTRODUCTION

Amavata was described for the first time in *Madhava Nidana* by *Madhavkara* in 7th A.D. as a separate disease entity and has also mentioned that *Ama* and *Vata* plays a vital role in the pathogenesis of this disease. *Amavata* is the particular type of disease which is mentioned in Ayurveda under the category of *Vata-Kaphaja* disorder. The main causative factor *Ama* is caused due to derangement of *Agni* especially *Jatharagni*.[3]

This disease is initiated by the consumption of *Virudha Ahara* (incompatible food) in the pre-existence of *Mandagni*. In it vitiated *Vayu* forcefully circulates the *Ama* all over the body through *Dhamnies* (circulatory channels) which take shelter in the *Shleshma sthana* (*Amashyas, Sandhi* etc.)

In Rheumatoid Arthritis producing symptoms such as Stiffness, Bodyache, Anorexia, Polydipsia, Lassitude, and Heaviness in body, Fever, Indigestion of food, Swelling of the body.[4] In the later stage pain may begin to migrate from place to place with a *Vrishchika Danshnavat Vedana* (intense stinging type of pain) and burning sensation. CRP with pathological Rheumatic factors are present in this type of disease.

Penicillin is an effective drug to treat Rheumatoid Arthritis and there is changing to decrease CRP titre, but still remainschallenging due to its adverse reaction and drug sensitivity. As per classical reference,*Vatari Guggulu* and *Pathyadi Churna* are a miraculous *Ayurvedic* formulations used for pain, swelling along with non suppurative inflammatary disease and autoimmune diseases. So an attempt is being taken to use there drugs of choice for CRP positive patients in *Amavata* (Rheumatoid Arthritis) for clinical trial.

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A. *Aim And Objective Of The Study*

1) To review the literature on CRP titre related to *Ayurveda* classics.
2) To evaluate clinical effect of *Vatari Guggulu* and *Pathyadi Churna* in high level of CRP titre in *Amavata* (Rheumatoid Arthritis).
3) To correlate the disease *Amavata* in relation to the signs and symptoms of modern diseases Rheumatoid Arthritis where CRP is positive.

II. MATERIALS AND METHODS

A. *Selection of Patients*

The total 30 patients (Group-A 15, Group-B 15) had been selected by a special proforma covering demography along with both Subjective and Objective parameters from OPD and IPD of Govt. Ayurvedic College and Hospital, Balangir and Saradeshweri Govt. Ayurvedic Hospital Balangir. The consent of patient was also taken before clinical trial.

B. *Inclusion criteria*

1) Patient with more than normal CRP level>6.0 mg/L
2) Patient's age between 12-60yrs of both sexes.
3) Patients having clinical features of Rheumatoid Arthritis and *Amavata* CRP positive selected for this study.

C. *Exclusion Criteria*

1) Age <12 and >60 years.
2) Patient having systemic illness like Hypertension, Hypotension, Heart disease, Tuberculosis, Severe anemia, HIV and Carcinogenic growth in body were excluded from the study.
3) Patients who have undergone recent surgeries.
4) Patients taking immunosuppressive medicines like Steroids etc.
5) Pregnant woman and lactating mother.

D. *Criteria for Investigations*

CRP, ESR, Hb%, DC, TLC and Lipid profile tests were investigated initially and during follow up periods.

E. *Selection of Drug*

Two trial drugs i.e. *Vatari Guggulu* and *Pathyadi Churna* had been taken for clinical trial. The drugs of both medicines were identified by the experts of Dept. of *Dravyaguna and Rasashastra and Bhisajya Kalpana* which were approved by DRC and IEC of College and Sambalpur University. Medicines were prepared in the GMP certified Mini Pharmacy of College under the supervision of expert of *Rasashastra and Bhisajya Kalpana.* The Sample of Research Medicine were sent to Quality Control Laboratories, KOPPA, Dist. Chikmagalur, Karnataka for their Analitical study.

Table No.01:Showing the Pharmocodynamics of drug of *Vatari Guggulu* and *Pathyadi Churna*

Name	*Rasa* (Essence)	*Guna* (Quality)	*Veerya* (Potency)	*Vipaka* (Post digestive effect)	*Doshakarmata & Prabhava*	Quantity Taken
VATARI GUGGULU						
Guggulu	*Tikta, Katu, Madhura, Kashaya*	*Laghu, Ruksha, Tikshna, Vishad, Shukshma, Sara (Old Guggulu) Snigdha, Pichchhil (New Guggulu)*	*Ushna*	*Katu*	*Tridoshashamaka*	150gm
Gandhak	*Tikta, Katu, Kashaya, Madhura*	*Ushna, Snigdha, Sara*	*Ushna*	*Katu / Madhura*	*Vatakaphashamaka, Rakta-sodhana, Krmighna*	150gm

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Eranda	*Madhura, Anurasa- Katu, Kashaya*	*Snigdha, Tikshna, Sukshma*	*Ushna*	*Madhura*	*Tridoshashamaka*	150ml
Haritaki	*Kashaya, Tikta, Madhura, Katu, Amla (Panchrasa alavana)*	*Laghu, Ruksha*	*Ushna*	*Madhura*	*Tridoshashamaka, especially Vatashamaka*	150gm
Vibhitaki	*Kashaya*	*Ruksha, Laghu*	*Ushna*	*Madhura*	*Tridoshashamaka, especially Kaphapittashamaka*	150gm
Amalaki	*Panchrasayukta (Amlapradhan) except lavan*	*Guru, Ruksha, Sheeta*	*Sheeta*	*Madhura*	*Tridoshashamaka, especially Pittashamaka*	150gm
PATHYADI CHURNA						
Haritaki	*Kashaya, Tikta, Madhura, Katu, Amla (Panchrasa alavana)*	*Laghu, Ruksha*	*Ushna*	*Madhura*	*Tridoshashamaka, especially Vatashamaka*	2kg
Sunthi	*Katu*	*Laghu, Snigdha*	*Ushna*	*Madhura*	*Vatakaphashamaka*	2kg
Yavani (Ajwain)	*Katu, Tikta*	*Laghu, Ruksha, Tikshana*	*Ushna*	*Katu*	*Vatakaphashamaka, Pittavardhaka*	2kg

Dose- Patients were advised to take *Vatari Guggulu* 2 tabs (500mg) thrice a day (1.5gms) and *Pathyadi Churna* 1tsf (5gm) twice daily after food both with *ushnajala* for 30 days in Group-A and Group-B respectively.

F. Assessment Criteria-

The Subjective parameters and Objective parameters as per Inclusion Criteria were assessed by the grading score from 0 to 3 according to the severity of diseases and favorable shift to back. Both parameters were followed up 10^{th}, 20^{th} and 30^{th} day of medication. The overall assessments were done considering the percentage relief of both parameters andstatistical evaluation.

III. OBSERVATION AND RESULTS-

The Clinical study period of 30 patients were taken from 06/08/2020 to 20/03/2021. Within aforesaid period the demography (Table No.02) based on Age-Sex-Religion etc. along with incidence of Dasvidha Pariksha (Table No.03) were observed and assessed.

Table No.02: Demography Incidence of Registered Patients. (n=30)

Criteria	Maximum Percentage	Category
Age	40%	46-60yr
Sex	70%	Female
Habitat	60%	Urban area
Religion	90%	Hindu
Occupation	56.67%	Housewives
Socio-economical status	80%	Middle Class
Educational Qualification	83.33%	Literate
Dietary Habits	80%	Mixed Diet
Habit/Addiction	86.67%	Taking Tea
Marital status	83.33%	Married

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Table No.03: Incidence of *Dashvidha-Pariksha* of Registered Patients.

Criteria	Maximum Percentage	Category
Prakriti	60%	*Vata-Kaphaja*
Vikriti	70%	*Madhyamabala Vyadhi*
Sara	70%	*Madhyamasara Purusha*
Samhanana	56.67%	*Madhyama*
Satmya	63.33%	*Madhyama*
Satva	73.33%	*Madhyama*
Ahara shakti	83.33%	*Avara Ahara shakti*
Vyayama shakti	76.33%	*Avara Vyayama shakti*
Pramana	53.33%	*Madhyama pramana*
Vaya	100%	*Madhyama vaya*
Desha	100%	*Jangala desha*

The Subjective and Objective parameters of both Group-A and Group-B were observed during clinical study. The percentage of improvement were also observed and assessed after clinical trial. (Table No.04)

Table no. 04: Total Patients as per disease and Percentage of Improvement in Group-A and Group-B. (n=15)

Subjective Parameters	Group-A		Group-B		Group-A	Group-B
	f	%	f	%	% of improve.	% of improve.
Sandhi Ruja (Joint Pain)	15	100	14	93.33	56.10	31.71
Sandhi Shotha (Swelling)	15	100	14	93.33	56.41	31.71
Sandhi Stabdhata (Stiffness)	14	93.33	15	100	58.54	34.15
Jwara (Fever)	13	86.67	13	86.67	61.54	30.56
Aruchi (Loss of Appetite)	13	86.67	14	93.33	61.54	51.43
Daurbalya (Weakness)	12	80	14	93.33	61.11	51.28
Objective Parameters						
CRP	15	100	15	100	55.88	44.44
ESR	15	100	15	100	50.17	46.93
Hb%	15	100	15	100	73.33	69.23

After observation of subjective and objective parameters, the statistical analyses of parameters were assessed by the helping statistical method. (Table No.05)

Figure No.01:Showing the effect of *Vatari Guggulu* and *Pathyadi Churna* on Subjective & Objective Parameters

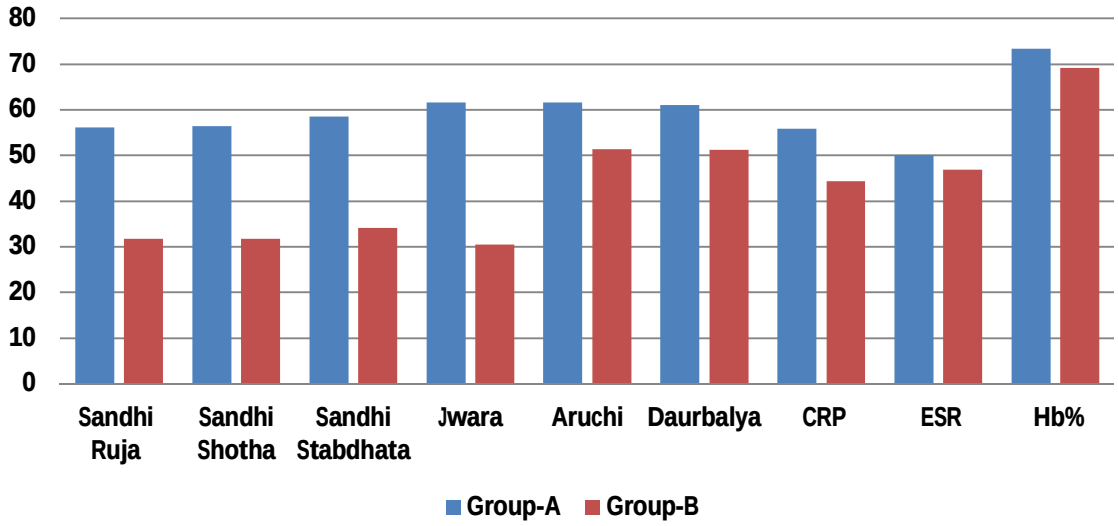


Table no. 05: Showing the Statistical Analysis of Subjective Parameter. (n=15)

Subjective Parameter	Groups	BT/ AT	Mean	Median	SD	Wilcoxon W	P-Value	% Effect	Result
Sandhi Ruja (Joint Pain)	Group-A	BT	2.73	3.00	0.46	-3.508[a]	0.00045	56.10	Sig
		AT	1.20	1.00	0.41				
	Group-B	BT	2.73	3.00	0.46	-.577[b]	0.56370	31.71	NS
		AT	1.87	2.00	0.35				
Sandhi Shotha (Swelling)	Group-A	BT	2.60	3.00	0.51	-3.508[a]	0.00045	56.41	Sig
		AT	1.13	1.00	0.52				
	Group-B	BT	2.73	3.00	0.46	-.577[a]	0.56370	31.71	NS
		AT	1.87	2.00	0.35				
Sandhi Stabdhata (Stiffness)	Group-A	BT	2.73	3.00	0.46	-3.487[a]	0.00049	58.54	Sig
		AT	1.13	1.00	0.52				
	Group-B	BT	2.73	3.00	0.46	-1.414[b]	0.15730	34.15	NS
		AT	1.80	2.00	0.77				
Jwara (Fever)	Group-A	BT	2.60	3.00	0.51	-3.487[a]	0.00049	61.54	Sig
		AT	1.00	1.00	0.53				
	Group-B	BT	2.40	2.00	0.51	-1.000[b]	0.31731	30.56	NS
		AT	1.67	2.00	0.72				
Aruchi (Loss of Appetite)	Group-A	BT	2.33	2.00	0.49	-3.578[a]	0.00035	54.29	Sig
		AT	1.07	1.00	0.46				
	Group-B	BT	2.33	2.00	0.49	-3.448[a]	0.00057	51.43	Sig
		AT	1.13	1.00	0.35				
Daurbalya (Weakness)	Group-A	BT	2.40	2.00	0.51	-3.508[a]	0.00045	61.11	Sig
		AT	0.93	1.00	0.26				
	Group-B	BT	2.60	3.00	0.51	-3.397[a]	0.00068	51.28	Sig
		AT	1.27	1.00	0.46				

Table no. 05: Showing the Statistical Analysis of ObjectiveParameter. (n=15)

Objective Parameters	Groups	BT/AT	Mean	SD	SE	t-Value	P-Value	% Change	Result
CRP	Group A	BT	2.27	0.80	0.21	10.717	0.000	55.88	Sig
		AT	1.00	0.93	0.24				
	Group B	BT	1.80	0.86	0.22	7.483	0.000	44.44	Sig
		AT	1.00	0.76	0.20				
ESR	Group A	BT	38.93	10.84	2.80	11.054	0.000	50.17	Sig
		AT	19.40	5.11	1.32				
	Group B	BT	35.80	10.63	2.75	8.911	0.000	46.93	Sig
		AT	19.00	5.21	1.35				
Hb%	Group A	BT	2.00	0.76	0.20	8.876	0.000	73.33	Sig
		AT	0.53	0.64	0.17				
	Group B	BT	1.73	0.70	0.18	11.225	0.000	69.23	Sig
		AT	0.53	0.64	0.17				

(SD=Standard Deviation, SE=Standard Error, t=Test of Significance, p=probability, <0.05= Significant at 5% level, >0.05= Not Significant at 5% level)

IV. DISCUSSION

Amavata can be co-related with Rheumatoid Arthritis. The clinical presentation of *Amavata* closely related with the special variety of Rheumetological disorders called Rheumatoid Arthritis (R.A.). The main clinical features of Rheumatoid Arthritis like Pain, Swelling, Stiffness, Fever, and general debility can be compared with clinical features of *Amavata* as mentioned in Ayurvedic Classics. But the *Nidana* of *Amavata* does not co-related with Rheumatoid Arthritis as it is an Auto-immune disease. The *Samprapti* of *Amavata* co-related with Rheumatoid Arthritis as in both the type of *Srotodusti* is *Sanga.*

The detail of *Amavata* was discussed in the form of *Nidana, Purvarupa, Rupa, Upasaya, Samprapti* and treatment which are described in *Lagutrayi* classical books. All these features were teken into consideration for this study as well as etiology, pathogenesis, clinical features and treatment described in modern science were also followed during research work.

The aim of present study was the effect of *Vatari Guggulu* and *Pathyadi Churna* on CRP Positive patients in *"Amavata (Rheumatoid Arthritis)". Vatari Guggulu* was a classical yoga which contains *Sudha Gandhak, Sudha Guggulu, Eranda tail, Amalaki churna, Vibhitaki churna,* and *Haritaki churna* selected from *Bhaisajya Ratnavali* and *Pathyadi Churna* was also a Classical yoga which contains *Haritaki, Sunthi* and *Yavani (Ajwain)* from *Cakradatta*. The whole study was performed in two groups i.e. Group-A treated with *Vatari Guggulu* and Group-B treated with *Pathyadi Churna.*

Predominant rasa of *Vatari Guggulu* is *katu, tikta, kasaya rasa* having *madhura* and *katu vipaka.* Mainly *katu, tikta* and *kasaya rasa* act on *Kapha dosha* whereas *Madhura Vipaka* helps in alleviation of *vata dosha.* The drugs also poses *ushna Veerya* act on *kapha and vata dosha. Laghu, ruksha and tikshana guna* act as *kapha shamaka* and *snigdha guna* act as *vata Shamaka.* This drug is predominantly *Tridoshahara.* It contains *Deepana Pachana* properties.

Predominant rasa of *Pathyadi Churna* is *katu, tikta, kasaya rasa* having *madhura* and *katu vipaka.* Mainly *katu, tikta* and *kasaya rasa* act on *kapha dosha* whereas *madhura vipaka* helps in alleviation of *vata dosha* and *katu vipaka helps in alleviation of kapha dosha.* The drugs also poses *ushna veerya* act on *kapha and vata dosha. Laghu, ruksha guna* act as *kapha shamaka.* This drug is predominantly *Vatakaphahara.* It contains *Deepana Pachana* properties.

It was observed from demographical study (Table No.02) that most of the patients were from Middle aged (46-60 years), female (70%), Hindu (90%) , Married (83.33%), Housewives (56.67%) having middle class socio-economic status (80%), addiction with tea- smoking (83.33%, 26.67%), Disturb sleeping habit (60%), Abnormal bowel habit (76.67%) and mixed variety dietary habits affected due to non-maintenance of hygienic lifestyle and dietic habit.

It was observed that maximum numbers of patients were having *Vata-kapha prakriti* (60%) with the predominance of *madhyama satwa-sara-samhanana-satmya-pramana*, and predominance of *Avara aharashakti-vyayama shakti* and *Madhyama Vaya.*

From the above Table No.04, It was observed that Patients treated with *Vatari Guggulu* (Group-A), was statistically significant(P<0.05) improvement in Subjective parameters symptoms like *Sandhi Ruja* (56.10%), *Sandhi Shotha* (56.41%), *Sandhi Stabdhata* (58.54%), *Jwara*(61.54%), *Aruchi*(61.54%) and *Daurbalya*(61.11%). In Objective parameters CRP (55.88%) was also observed Statistically Significant (P<0.05).

In Group-B patients treated with *Pathyadi Churna*, was observed statistically not significant (P>0.05) improvement in subjective parameters like *Sandhi Ruja*(31.71%), *Sandhi Shotha*(31.71%), *Sandhi Stabdhata*(34.15%), and *Jwara(*30.56%) and other subjective parameters like *Aruchi*(51.43%) and *Daurbalya*(51.28%) was observed statistically significant (P<0.05). In objective parameters CRP (44.44%) was observed statistically significant (P<0.05) but less than Group-A patients.

Regarding Serological Findings improvement was noticed equally statistically significant (P<0.05) in both Group-A and Group-B. but more improvement was revealed in Group-A

It was revealed that, P-Values (P<0.05) for Objective parameters were statistically significant in both Group-A and Group-B. Further it showed that, mean rank for Group-A was greater than Group-B and effect of *Vatari Guggulu* (Group-A) was more than *Pathyadi Churna* (Group-B).

Further it was observed that, mean rank for Group-A was greater than Group-B. The overall percentage of improvement in Group-A (57.99%) is more than Group-B (38.47%). Hence it was revealed that, effect observed in Group-A is more than Group-B.

As regards to CRP, it was revealed that, P-Value is less than 0.05 and mean difference for Group A is greater than Group B. Hence it conclude that, effect observed in Group-A was better than Group-B.

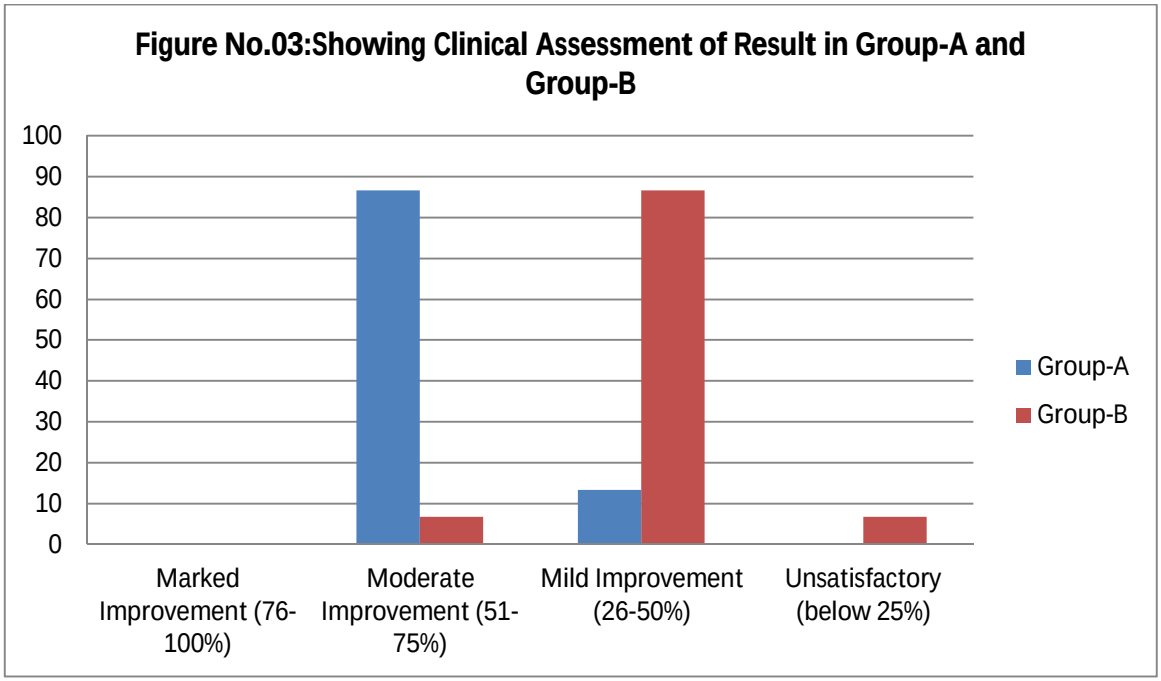
Table No.06; Showing Clinical Assessment of Result in Group-A and Group-B

Clinical Assessment	After Treatment			
	Group-A		Group-B	
	No. of Patients	%age	No. of Patients	%age
Marked Improvement (76-100%)	00	00	00	00
Moderate Improvement (51-75%)	13	86.67	01	6.67
Mild Improvement (26-50%)	02	13.33	13	86.67
Unsatisfactory (below 25%)	00	00	01	6.67

In assessing overall effect of therapy, it was seen that:

- Overall comparison showed that best results was obtained in Group-A (Vatari Guggulu) in the form of better clinical response and statistical significance.
- Present study reveals that the selected *Vatari Guggulu* drug has potential effect on *Amavata* with the added advantage of being free from side effects.

Figure No.03:Showing Clinical Assessment of Result in Group-A and Group-B



V. CONCLUSION

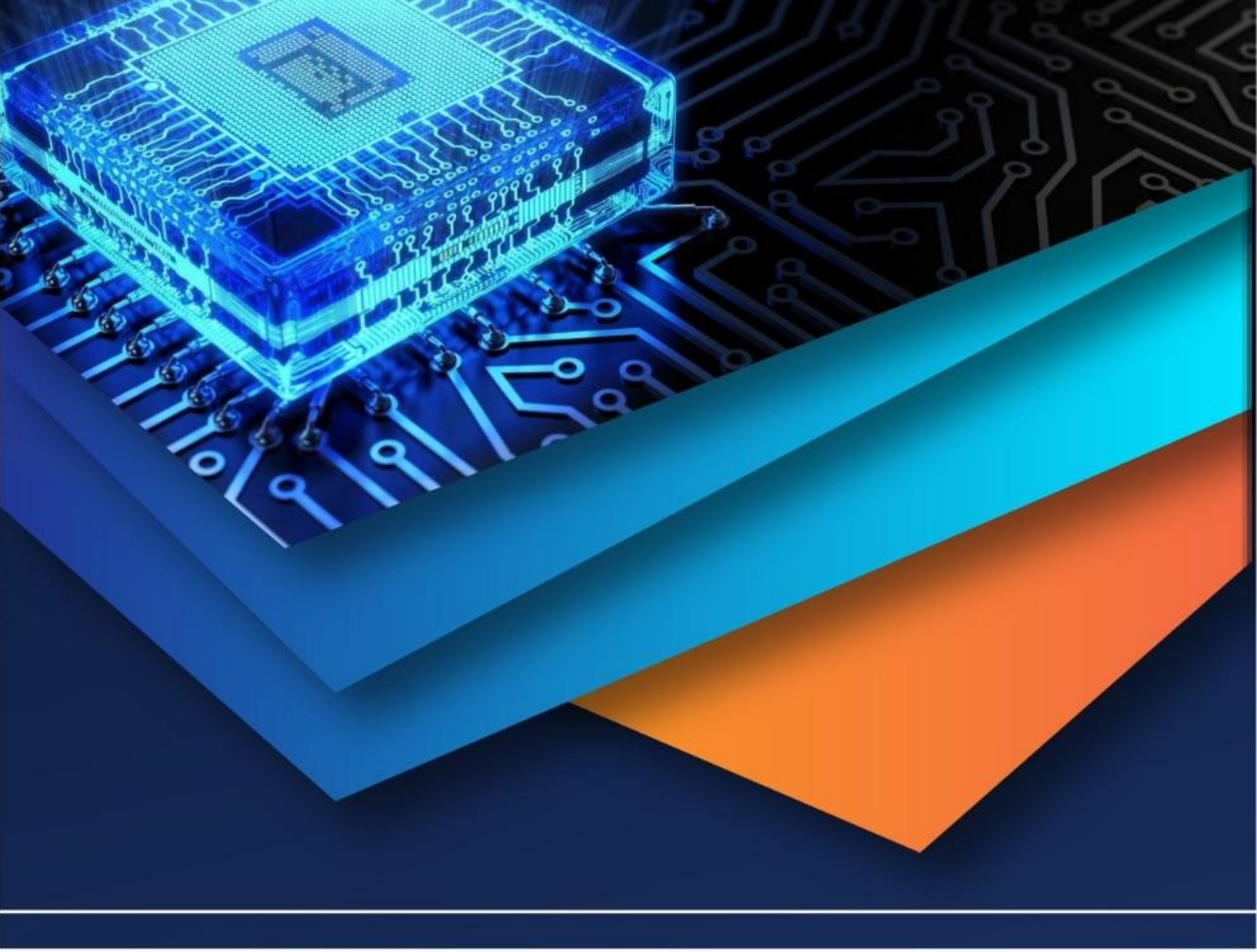
CRP positive patients suffered from *Amavata* (Rheumatoid Arthritis) showed significant improvement in Subjective and Objective parameters after receiving the *Ayurvedic* formulation '*Vatari Guggulu'*. So '*Vatari Guggulu'* has provided significant result in improving signs and symptoms and decreased the levels of CRP in *Amavata* (Rheumatoid Arthritis) patients. *Pathyadi Churna* shows no response and no improvement in Subjective parameters like *Sandhi Ruja, Sandhi Shotha, Sandhi Stabdhata* and *Jwara. Pathyadi Churna* showed response and significant improvement in Subjective parameters like *Aruchi, Daurbalya* and Objective parameters like CRP, ESR and Hb%. Present study was carried out with certain limitations like fewer samples. Forth coming researchers may pursue further study in a large sample size over a period of longer duration. No side effect was noticed during clinical trial in both the groups.

VI. ACKNOWLEDGEMENT

I am very much grateful and thankful to Dr. G.B. Acharya, H.O.D *Dravyaguna*, Dr. S.B. Behera, H.O.D *Rasashastra & Bhaisajya Kalpana*, Dr. Manoj Kumar Sahu, H.O.D. *Samhita & Sidhanta*, Dr. Vinod Chandra Singh, Lecturer, RNVV, Dr. Manoranjan Sahu, Lecturer, RNVV for their grateful blessings. I am also thankful to Dr. Dusmanta Kumar Majhi, Dr Bishnupriya Lenka, Dr. Esha Dhiman, Dr. Saumyaleena Baral, and Dr. Madhusmitarani Sethi all my P.G. Scholars friends, Hospital Staff and other Staff of RNVV dept. for their constant helping attitude to complete the research work with a full satisfaction and belief.

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