



Research Article

EXPERIMENTAL EVALUATION OF *ELADI GUTIKA* FOR ITS ANTI-RHEUMATIC ACTIVITY

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ABSTRACT

Background: *Amavata* is a disease caused due to the vitiation or aggravation of *Vata* associated with *Ama*. Vitiated *Vatadosha* circulates the *Ama* all over the body and *Sthanasamshraya* in joints producing symptoms such as stiffness, swelling and tenderness in multiple joints. The symptoms of *Amavata* are identical to Rheumatoid arthritis.

Rheumatoid arthritis is affecting the people predominantly between the ages of 30 to 50 years with predictable course it is a chronic inflammatory and systemic auto-immune disease. About 1% of the world population is affected by Rheumatoid arthritis and 2 to 3 times more common in women than men.

Aim and objective: An experimental evaluation of *Eladi gutika* for its anti-rheumatic activity.

Methods: The experimental study was a three-group experimental study, conducted on 6 different rats on each group. Total 18 healthy Sprague-Dawley rats weighing between 150-200gms will be taken and divided randomly into three groups; Rats were induced rheumatoid arthritis with single subcutaneous injection of "Freund's complete adjuvant (0.05ml-0.1ml) into footpad or base of the tail. The rats exhibit rheumatic symptoms within 12-14 days. Rats of group 1 will be administered with distilled water served as control group. Group 2 will be administered with celecoxib 10 mg/kg. Group 3 will be administered with *Eladi gutika* 40 mg/kg (trial group) for 21 day.

Results: In the experimental study the result was showed as the *Eladi gutika* helps to decrease the CRP and ESR levels.

Conclusion: From the experimental study the result it was found that *Eladi gutika* showed mild ant-rheumatic activity. Hence, it was inferred that the selected *Eladi gutika* inhibits the anti-rheumatic activity and there by curing *Amavata*.


INTRODUCTION

The main aim of Ayurveda is to help the healthy person to protect and maintain health, to eradicate the diseases of the diseased person^[1].

In the world of technology and competition where man neglects his health which lead to stress full life and lifestyle disorders. Ayurveda has discussed conduct under the topic *Sadvrutta*. According to classical references, Ayurveda emphasizes on systematic and healthy lifestyle which includes food, activities, sleep, thoughts etc.

In *Astangahrudaya sutrasthana*, *Vaghbatha* explains about the *Sadvrutta* (ethical regimen) that one must follow. *Sadvrutta* help in keeping the mind healthy. A healthy mind is as important for a healthy body. Unhealthy mind generates wrong judgments and misconceptions which in turn is responsible for causing diseases^[2]. Ayurveda is a holistic system of healthcare that originated in the ancient *Vedic* period. Rasashastra is a part of Ayurveda devoted for the preparations of herbal, mineral and herbo-mineral formulations. It aims in designing classical drugs with better therapeutic attributes at minimum dose.^[3]

Rheumatoid arthritis is most common chronic autoimmune disease with the symptoms of pain, stiffness, swelling of joints^[4]. RA is a symmetrical, destructive, and deforming polyarthritis which affecting small and large synovial joints with associated systemic disturbance, a variety of extra-

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articular features and the presence of circulating anti-globulin (Rheumatoid factor). It has worldwide prevalence of about 1% of adult population. This has affected women more than men with an annual incidence of 3 per 10000 adults. The prevalence of rheumatoid arthritis increases with age in both sexes with nearly 5% women and 2% men over 55 years of age.

Amavata is a term derived from *Aama* and *Vata* which are predominant pathological factors acting in the disease process. *Amavata* is a disease in which vitiated *Ama* circulates all over the body by *Vatadosha* and accumulation and takes place in *Sandhis* and characterised by inflammation, soreness, stiffness in the muscle and pain in and around the joints. *Nidana* according to classical texts are *Virudhaahara*, *Virudhachesta*, *Mandagni*, *Nischestata* and consumption of *Kandashakhas*. Number of anti-rheumatic drugs has been mentioned in Ayurvedic classical texts^[5]. *Eladigutika* is one such formulation explained in classical text *Bhaishajya Rathnavali Raktapittadikara*. *Eladigutika* is a traditional Ayurvedic poly herbal formulation used as a remedy for *Kasa*, *Swasa*, *Bhrama*, *Rakthapitta*, *Jwara*, *Chardi* and *Amavata*. It is a formulation having *Ela*, *Patra*, *Twak*, *Pippali*, *Sarkara*, *Yastimadhu*, *Kharjurapinda*, *Draksha*

and *Madhu*. Here an attempt made to study about the efficacy of *Eladigutika* for its Anti-Rheumatic activity.

MATERIALS AND METHODS

The raw drug was purchased from Indian Drug House, Malleshwaram, Bengaluru, Amruth Kesari Depot, Chickpet, Bengaluru, Dry Fruit House, Yelahanka and local market at Yelahanka, Bengaluru. The test drug was prepared from Department of Rasa Shastra & Bhaishajya Kalpana, Ramakrishna Ayurvedic Medical College, Yelahanka, Bengaluru. All the Chemical reagents and other requirements of experimental study used from stock of In-vivo biosciences Bengaluru.

Total 18 healthy Sprague-Dawley rats weighing between 150-200gms will be taken and divided randomly into three groups, each containing six rats, maintained under a constant 12hr light and dark cycle at 22-24 and at 45%-55% relative humidity. Animals were feed with pelleted rodent from VRK nutrition solutions. Deep bore well water passed through charcoal filters and exposed to UV rays and water in polypropylene water bottles were provided to the animals. The Animal Ethical committee has approved for experiment on animals (Approval number In-vivo/104).

Table 1: Group Allocation

Group No	Treatment group	Dose	No. of animals	Animal numbers	
1	Control	-	6	1	6
2	Positive control (Celecoxib)	10 mg/kg	6	7	12
3	<i>Eladigutika</i>	40 mg/kg	6	13	18

Rats of group 1 will be administered with distilled water served as control group. Group 2 will be administered with celecoxib 10mg/kg. Group 3 will be administered with *Eladi gutika* 40mg/kg (trial group) for 21 day. The anti-arthritis activity of test samples was studied in SD rats by administering the test substance orally in FCA induced rheumatic rats. The test substances were administered for 21 days. On 21st day all the animals were anesthetized, and blood was collected for biochemical analysis of CRP and ESR. Subsequently all the animals were sacrificed to collect spleen.

Average of all the data was compiled and SEM was calculated. All the data was analyzed using one-way ANOVA followed by Dunnett's multiple comparison test

OBSERVATION AND RESULTS

The effect of the drugs in body weight, spleen, ESR and CRP of the animals as shown in the below table.

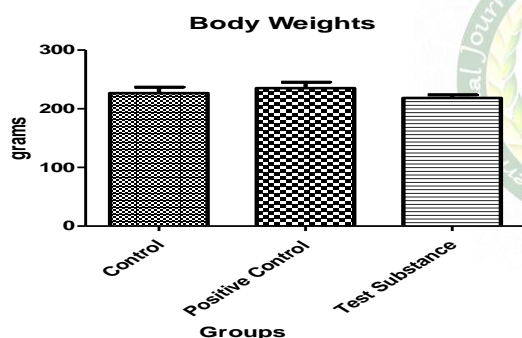
Table 2: Effect of the drugs in animals

Group	Animal No.	Body weights (g)	Spleen (g)	ESR (mm/hr)	CRP(mg/dL)
Negative Control	1	264	0.73	8.59	8.52
	2	217	0.92	9.02	8.68
	3	242	0.73	8.13	8.62
	4	230	1.01	8.16	8.74
	5	215	0.93	7.63	8.65
	6	192	0.83	7.82	8.54
Mean		226.7	0.9	8.2	8.6

SEM		10.1	0.0	0.2	0.0
Positive control	7	280	0.58	3.51	5.68
	8	240	0.69	3.99	5.74
	9	240	0.66	3.52	5.86
	10	220	0.57	4.39	5.46
	11	216	0.71	4.11	5.62
	12	215	0.64	4.29	5.87
Mean		235.2	0.6	4.0	5.7
SEM		10.1	0.0	0.2	0.1
Test substance	13	220	0.82	6.93	8.82
	14	210	0.63	7.31	8.54
	15	204	0.72	7.34	7.68
	16	227	0.81	6.52	7.98
	17	239	0.66	7.77	8.21
	18	210	0.83	8.12	8.25
Mean		218.3	0.7	7.3	8.2
SEM		5.3	0.0	0.2	0.2

The effect of the drugs in body weight of the animals as shown in the below graph.

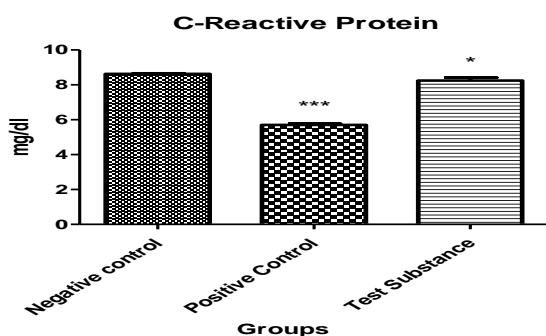
Graph 1: Effect of the drugs in body weight



There was no significant body weights difference observed when compared with negative control.

The effect of the drugs in CRP of the animals as shown in the below graph.

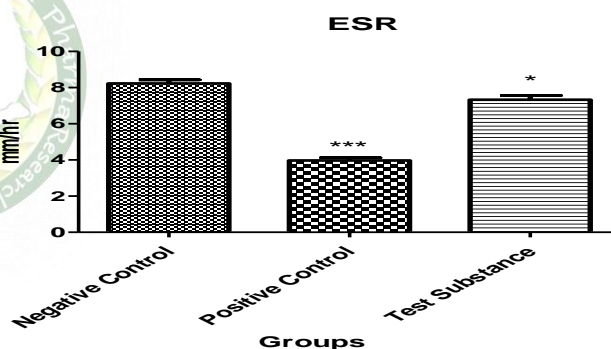
Graph 2: Effect of the drugs in CRP



The C-reactive protein was increased in negative control group, and in the test drug group have shown the decrease in c- reactive protein when compared against negative control group.

The effect of the drugs in ESR of the animals as shown in the below graph.

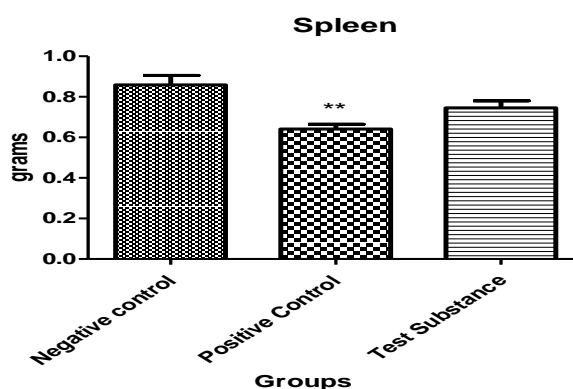
Graph 3: Effect of the drugs in ESR



The ESR elevated in negative control group, which is an indication of arthritic condition, while in test drug group showed decrease in ESR level when compared against the negative control group.

The effect of the drugs in Spleen weight of the animals as shown in the below graph.

Graph 4: Effect of the drugs in Spleen weight



The organ weight of spleen was measured, and it was found that, there is an increase in weight of the spleen in negative control group where spleen weight was stable and normal in the treatment groups.

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DISCUSSION

In *Bhaishajya ratnavali raktapittadhikara* mentioned *Eladi gutika* with the ingredients (*Ela, Twak, Tamalapatra, Pippali, Yastimadhu, Draksha, Kharjura, Sarkara* and *Madhu*), therapeutic uses and dosage. The ingredients of *Eladi gutika* are *Madhura Kashaya Rasa*, predominant *Sheeta Veerya, Madhura vipaka, Guru* and *Snigdha* in nature with alleviating action on all *Doshas*. The contents drug of *Vati* showed a very good action when administered to rats for curing induced Arthritic activity, *Amavata* is condition with *Ama* and *Vikrutha Vatavikara* in which there is vitiation of *Vata, Pitta dosha* and *Dushti* of *Ama* and involves all the *Dhatus*. The *Ama* in the body associates with *Vata* and produces *Amavata lakshanas*. *Eladi gutika* bring back the balance of these factors and promote the good anti-rheumatic activity, by reducing elevated CRP & ESR levels. Pharmacologically drugs act as immunomodulators, anti-inflammatory & antioxidants. By virtue of *Yastimadhu*, These may be attributed to antioxidant activity. *Katu Rasa* of *Pippali* helps to equalize the vitiated *Doshas*, *Madhura Rasa* influences in *Prasadana*, improves strength and helps in *Rakta Vrudhi* and it also alleviates vitiated *Pitta* and *Vata*. By virtue of *Sheeta Veerya* reduces *Daha* (burning sensation) and helps in reducing inflammation. Thus the experimental study of anti-rheumatic activity which is mainly due to vitiated *Dosha* association with *Ama* will be taken care by *Rasa* and *Dosha* alleviating properties of *Eladi gutika*.

After the end of dosing period, blood was collected from all the animals for biochemistry (ESR, CRP). Spleen was isolated and weight. The C-reactive protein was increased in negative control group, while the *Eladi gutika* treatment groups have shown

decrease in c-reactive protein when compared against negative control group. The ESR elevated in negative control group, which is an indication of arthritic condition, while in the *Eladi gutika* treatment groups showed decrease in ESR level when it compared against the negative control group. The organ weight of spleen was measured, and it was found that there is an increase in weight of the spleen in negative control group where as spleen weight was stable and normal in the treatment groups. There was no significant body weights difference observed when compared with negative control. The decrease in the mean suggests significant reduction in the *Amavata lakshana*. It also indicates that after each day of intervention the severity of the condition is getting relieved, which can be attributed to the anti-inflammatory properties of the drugs present in the intervention.

CONCLUSION

On the basis of experimental observations made in this study, Anti-rheumatic activity was carried out on SD rats to prove the action of the *Eladi vati*, *Eladi vati* proves to be highly beneficial in treatment of *Amavata*.

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