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Research Article

EFFECT OF ANTI INFLAMMATORY ACTIVITY OF AYURVEDIC CAPSULE IN ALBINO RATS

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ABSTRACT

The inflammatory response is a biological reaction that takes place in response to damaging stimuli such as pathogens, damaged cells, or irritants. This reaction takes place in order to protect the body from further harm caused by the damaging stimuli. The body goes through this reaction so that it can defend itself against any additional damage. It is clinically characterised by cardinal symptoms such as redness, fever, discomfort, and edema, and it performs a preventive role through the body's natural defense systems while simultaneously causing edema. Additionally, it is clinically characterized by edema. In addition to this, it will eventually result in edema. Because natural therapies are perceived to be safer and to have fewer unpleasant side effects, natural medications are regarded as being preferable to their synthetic equivalents. This is the primary reason why natural medicines are preferred. In laboratories, synthetic medications were conceived and birthed. Over the course of the past several years, the demand for synthetic herbal formulations has been consistently expanding throughout all of the marketplaces across the world.

INTRODUCTION

Inflammation is a natural protective response that occurs in response to tissue damage brought on by toxic chemicals, infectious agents, or damaging physical trauma [1]. Inflammation is a natural protective response that occurs in response to tissue damage brought on by toxic chemicals [2]. Inflammation is a natural protective response that happens as a response to tissue damage caused by toxic substances. This damage can occur as a direct or indirect result of inflammation [3]. The process by which the body attempts to defend itself against foreign pathogens by neutralizing or destroying them, ridding itself of irritants, and preparing damaged tissue for repair is referred to as inflammation [4]. This procedure kicks off when the body identifies an incoming microorganism from the environment as a potential threat. Damage to cells is caused by inflammation, which in turn has an effect on cell membranes, which in turn induces leukocytes to release lysosomal enzymes [5]. Inflammation is responsible for causing this chain reaction. The subsequent step in the production of various eicosanoids involves the release of arachidonic acid from the molecule that serves as a precursor. After the formation of the precursor molecule, this phase can then take place. The cyclooxygenase pathway of the arachidonic acid metabolism is responsible for the generation of prostaglandins, which have a variety of effects on cells that are engaged in the inflammatory process as well as blood vessels and nerve terminals [6]. Prostaglandins are also responsible for the production of eicosanoids, which play a role in the development of atherosclerosis [7]. In order to determine whether or not anti-inflammatory pharmaceuticals are effective, researchers studied the inflammatory reactions that occurred in animals after they were given injections of unknown or potentially harmful compounds. The researchers could then determine whether or not the drugs were effective as a result of this. The testing for anti-inflammatory effect is based on the reduction of local edoema that is brought on by the injection of irritants, which are compounds that generate inflammation. This constitutes the primary basis for the structure [8]. A wide variety of triggers can set off a chain of events known as the inflammatory process, which is comprised of a variety of different activities. These events are arranged in this fashion in order to (infectious agents, ischemia, antigen antibody interactions, burns or other physical injuries, etc.). The following is a list of the three stages that are involved in the

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process of inflammation, starting from the beginning and going all the way through to the end [9]:

1. The enlargement of small blood vessels, which leads to an increase in their permeability, which results in the creation of edoema and swelling.
2. The migration of leukocytes from venues and capillaries, which results in cellular infiltration and general clearance.
3. The multiplication of fibroblasts and the formation of new connective tissue in order to repair any damage that might have been done.

It has been discovered that the early stages (the first stage) of the development of various experimentally generated inflammatory processes are under the control of a variety of different mediators [10].

In the course of this research project, herbal capsule preparations are put through their paces so that researchers can evaluate the possibility of the growth of anti-inflammatory qualities. In order to evaluate the anti-inflammatory activity of herbal capsules in adult albino rat models, this study will compare them to the standard drug indomethacin using a model of carrageenan-induced paw edema.

MATERIAL AND METHODS

The study was undertaken at the Sangli, India, Biocyte centre for R&D after it was given the go light by the Institutional Animal Ethical Committee. The study was undertaken at the Sangli, India, Biocyte centre for R&D after it was given the go light by the Institutional Animal Ethical Committee. 24 mature albino rats of either sex were split into 4 groups of 6 and given various levels of Diclofenac sodium via oral administration. Paw swelling was observed in rats given 1% Carrageenan. The percentage of edema decrease was estimated by comparing the difference in volume between the left and right paws. The volume of each paw was measured for 30 minutes, one hour, two hours, three hours, and four hours after the injection.

Experimental design: For this experiment, 24 mature albino rats of either sex were split into 4 groups of 6. Before the experiment, animals were housed in cages for a week to help them adjust to their new environment. They were maintained in a room with a constant temperature, required to fast overnight, and given free access to water during the day. Those in Group I, the control group, were given free access to food and water at all times. Group II served as the control and got 10 milligram's of Diclofenac sodium per kilogram of body weight via oral administration, while Groups III and IV were given 200 and 400 milligrammes of the test chemical, respectively [11].

Table 1 Experimental design

Groups	Study	Treatment
1	Control	Normal saline (10ml/kg)
2	Standard	Diclofenac sodium (10mg/kg)
3	Test I	LPE 200mg/kg
4	Test II	LPE 400mg/kg

Methodology: Paw swelling was observed in rats given 1% **Carrageenan**. An edematous condition was generated by injecting 0.1 ml of sterile Carrageenan in saline sub plantarly into the left hind paw. One hour before to the carrageenan injection, both the reference medicine and the experimental drug were given. After 30 minutes, 1 hour, 2 hours, 3 hours, and 4 hours of carrageenan injection, plethysmograph measurements were taken of the paw edoema (at the level of the ankle joint). The percentage of edoema decrease was estimated by comparing the difference in volume between the left and right paws to that of the control animals [12-14].

$$\text{Percentage inhibition in edema} = \frac{Vc - Vt}{Vc} \times 100$$

Vc - Mean volume of paw edema in control group Vt - Mean volume of paw edema in the drug treated groups

Statistical Analysis: The statistical analysis was carried out utilizing the analysis of variance (ANOVA) method in a single direction. Following the conclusion that P values with a 95% confidence limit that were lower than 0.05 were statistically significant, a Fisher's least significant difference post hoc test was carried out. The software known as Graph Pad was used in order to carry out the task of doing an analysis on the data.

RESULT

Following the injection of carrageenan, the volume of each paw was measured thirty minutes, one hour, two hours, three hours, and four hours after the injection. This was done for all of the groups. According to the information contained in the table, the paw volume of the control group had an increase of 8.44±0.19 percent. The volume of the control group was 6.86 ±0.05at 30 min, but after four hours, it had dropped to 4.82±0.30. In a manner that is identical to the previous example, the paw volume of the test groups III and IV was 6.13±0.09 and 5.95±0.14 after 30 minutes, and 4.7±0.03 and 4.22±0.07 after four hours, respectively.

Table 2 Experimental results

Time Interval	Control	Standard	Test I	Test II
30 min	8.44±0.19	6.86±0.05	6.13±0.09	5.95±0.14
1Hr	8.57±0.15	6.61±0.31	5.90±0.09	5.33±0.09
2 Hr	8.62±0.16	6.32±0.15	5.5±0.10	5.04±0.25
3 Hr	8.09±0.17	5.06±0.29	5.07±0.05	4.43±0.15
4 Hr	7.62±0.41	4.82±0.30	4.7±0.03	4.22±0.07

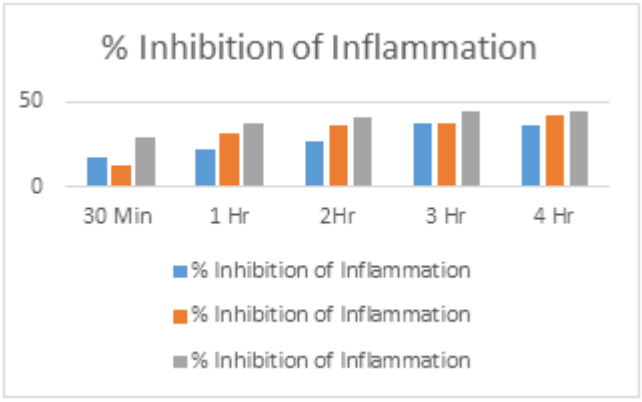

Figure 1 % Inhibition of inflammation

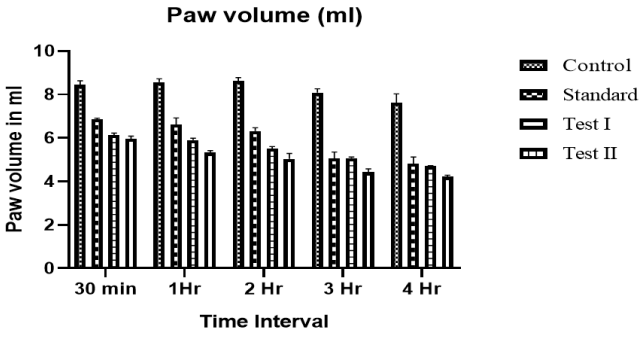

Figure 2 Paw volume (ml)

When compared with the control group, the groups that were treated with the standard medicine and the test drug demonstrated a statistically significant difference in the anti-inflammatory activity that they exhibited. Anti-inflammatory activity for the test drug when compared to the control was in the order of Group Standard >Test II >Test I> Control.

Table 3 % Inhibition of Inflammation

% Inhibition of Inflammation			
Time Interval	Standard	LPE 200	LPE 400
30 Min	18.04	13.03	29.5
1 Hr	22.87	31.15	37.8
2Hr	26.68	36.19	41.53
3 Hr	37.45	37.33	45.24
4 Hr	36.74	42.65	44.61

Figure 3 Experimentation on animals

CONCLUSION

Inflammation is a natural protective response that occurs in response to tissue damage brought on by toxic chemicals, infectious agents, or damaging physical trauma. In order to determine whether or not anti-inflammatory pharmaceuticals are effective, researchers studied the inflammatory reactions that occurred in animals after they were given injections of unknown compounds.

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