Amavata is one type of disease which is mentioned in text of Madhav nidan. Symptoms of Amavat in Ayurveda are similar to that of Rheumatoid arthritis (RA). For this disease many Herbal & Herbomineral formulation are mentioned in Ayurveda. Hinguleshwar rasa is one of the Herbomineral formulation in Ayurveda. Inflammation of the joints is a more common symptom found in many cases of Rheumatoid arthritis. In this study Anti-inflammatory activity of Hinguleshwar rasa was evaluated by measuring paw volume in Freud’s complete adjuvant (FCA) induced RA model of rats. In 28 days, study, standard drug Indomethacin & test drug Hinguleshwar rasa was administered orally from day 14 (After administration of FCA and development of arthritis). After administration of single oral dose of Hinguleshwar rasa & Indomethacin per day for next 14 days it is observed that, swelling of paw volume of rats was significantly reduced in standard and test group of animals on day 28, hence can be concluded that Hinguleshwar rasa also helps to reduce swelling in rats as compared to Indomethacin and it may be useful in treatment of Rheumatoid arthritis (Amavata).
INTRODUCTION:
Amavata disease was mentioned in text of Madhvanidan\(^\text{1}\). The Rheumatoid arthritis (RA) has been described as Amavata in Ayurveda, in which the vitiated Vata and Ama afflicts the lining of the joints, causing Shula (Pain) & Shotha (Swelling)\(^\text{2}\). In Ayurveda many formulations on (Amavata) Rheumatoid arthritis are mentioned in text. Hinguleshwar rasa \(^\text{3}\) is a one of the Herbomineral formulation which is mentioned in Ayurvedic text. Indication of Hingulehwar rasa on Amavata was mentioned in text of Rasa tarangini\(^\text{4}\). Inflammation on joints is a more common symptom found in cases of Rheumatoid arthritis (RA). In this study we try to evaluate in vivo anti-inflammatory activity of Hinguleshwar rasa with compared to Indomethacin on Rheumatoid arthritis (Amavat).

MATERIAL & METHOD
The Ayurvedic formulation Hinguleshwar rasa\(^\text{3}\) was carried out in Department of Rasashastra & Bhaishajya kalpana, D Y Patil Deemed to be university Nerul, Navi Mumbai & Tablet Indomethacin procured from pharmacy.

Ingredients in Hinguleshwar rasa:

1) Pippali: 100 gm
2) Purified Hingul (Cinnabar): 100gm
3) Purified Vatsanabh : 100 gm

Invivo FCA induced Rheumatoid arthritis (RA) study in rats was conducted at Department of pharmacology & toxicology, KNP college of Veterinary Science Shirwal, Dist-Satara, Maharashtra.

Animal study: Sprague-Dawley rats (32) were recruited in the animal study with 50% male and female ratio. All the animals were weighing 180 – 200 g. which were procured from National institute of Biosciences, Bhor, Pune, after getting approval from the Institutional Animal ethics committee, of the KNPCVS, Shirwal. Animals were transported in AC vehicle and kept for quarantine for 10 days at Central laboratory Animal House of the KNPCVS Shirwal, District Satara. All the animals were apparently healthy and without any disease signs. Animals were divided into four groups comprising of eight animals in each group. The grouping of the animals was as follows (Table 1). All the animals in each group were marked with picric acid markings.

<table>
<thead>
<tr>
<th>Group no.</th>
<th>Group (n=8)</th>
<th>Treatment offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Normal control (NC)</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Disease control (DC)</td>
<td>FCA (0.1 ml- Subplantar)</td>
</tr>
<tr>
<td>3</td>
<td>Standard (STD)</td>
<td>FCA + Indomethacin (2 mg/kg p.o.)</td>
</tr>
<tr>
<td>4</td>
<td>Test group</td>
<td>FCA + Hinguleshwar Rasa (Human dose converted to Rat dose =1.125 mg (for 200 gm rat)</td>
</tr>
</tbody>
</table>

Animals from the Group 1 received normal saline at 1ml /day, group 2, 3 and 4 received 0.1ml FCA \(^\text{5}\) and administered with 26g needle in sub plantar region. Further animals of group 3 received Indomethacin at 2 mg/kg orally\(^\text{9}\) after day 14 onwards. Animals from the group 4 received Hinguleshwar rasa at 1.125 mg per rat.

Arthritis induction in Rats:
1) Prior to the experiment, paw volume (baseline) of each animal at ‘0’ day was measured. All animals of group 2,3 and 4 were receiving sub-plantar injection of FCA (0.1 ml)\(^\text{5}\) in left hind paw, whereas normal control group (Group 1) left untreated and receiving only normal saline.
2) Rats were left for 14 days after the injection of FCA to allow the development of arthritis (inflammation).
Starting from day 14, Indomethacin and Test drug (Hinguleshwar Rasa) was administered orally daily till day 28.

3) Paw volumes of all animals were recorded on day 0, 14, 21 & Day 28.

RESULTS

Animals from group 2, 3 and 4 showed swelling after day 14. The treatment was started on day 15 to day 28. The paw volumes of all the animals were recorded with Vernier calliper (Table 2.)

Table 2: Paw volumes (in mm) in all the animals

<table>
<thead>
<tr>
<th>S.No</th>
<th>Day 0</th>
<th>Day 14</th>
<th>Day 21</th>
<th>Day 28</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>5.163±0.691</td>
<td>5.138±0.042b</td>
<td>5.113±0.069d</td>
<td>5.125±0.049d</td>
</tr>
<tr>
<td>Group 2</td>
<td>5.150±0.729</td>
<td>7.625±0.162a</td>
<td>7.538±0.846a</td>
<td>7.500±0.116a</td>
</tr>
<tr>
<td>Group 3</td>
<td>5.188±0.740</td>
<td>7.613±0.850a</td>
<td>6.288±0.703c</td>
<td>5.363±0.597c</td>
</tr>
<tr>
<td>Group 4</td>
<td>5.213±0.737</td>
<td>7.638±1.020a</td>
<td>6.888±0.090b</td>
<td>5.775±0.070b</td>
</tr>
</tbody>
</table>

From the above table, it is obvious that the paw volumes of the group 2, 3, and 4 were increased and showing significant differences from that of control group 1. As these groups received Freuds complete adjuvant the paw volumes were increased and found that FCA can induce inflammation. During the study there was no change in the paw volumes of the control group from day 0 to day 28. Animals from the group 2 which received FCA in their hind paws, they showed consistent swelling till day 28. Animals from the group 3 which received the Indomethacin, which is a standard anti-inflammatory agent, showed anti-inflammatory efficacy and the paw swellings were reduced and comes to normal at day 28 of the study. Regarding animals of the group 4 who received the formulation Hinguleshwar rasa show reduction in swelling at day 21 and 28. On day 28 all the animals from group 1, 3, and 4 were showing normal paw volume and no significant differences were observed among them. However, group 2 which was the disease control group showed high paw volume and was significantly differing from other normal and treatment group.
DISCUSSION:
In ancient Ayurvedic texts many formulations on Amavata (Rheumatoid arthritis) was mentioned. Hinguleshwar rasa is one of the Herbomineral formulation which is mentioned in the book of Rasatarngini. Because its indication on Amavata (Rheumatoid arthritis) we test its anti-inflammatory action on FCA induced rheumatoid arthritis model of rats. In Ayurveda combined as well as individual action of each ingredient in Hinguleshwar rasa (Pippali, purified Vatsanabh & purified Hingul) are mentioned on Amavata[4,6,7,8] (Rheumatoid arthritis). Inflammation was a very common symptom found in Rheumatoid arthritis. In this study, the result of FCA induced swelling in left paw of rats we found that paw volume of 3rd group of standard drug Indomethacin and 4th test group of Hinguleshwar rasa was significantly decreased within ‘14’ days. According to the results Hinguleshwar rasa may helpful to treat the cases of Amavat (Rheumatoid arthritis).

CONCLUSION:
Hence this can be concluded that Hinguleshwar rasa as compared to Indomethacin helps to reduce swelling in ‘14’ days in FCA induced Rheumatoid arthritis rat model. Further laboratory studies should be carried out to find out the mechanisms of anti-inflammatory activity of the Hinguleshwar rasa in animals and humans.

REFERENCES:
2) Ayurvedic Guidelines for Amavata (Rheumatoid Arthritis)- ccras,http://www. ccras.nic.in /content/
ayurvedic-guidelines-amavata-rheumatoid-arthritis.


How To Cite This Article:

Conflict of Interest: None declared

Source of Support: Nil

Your next submission with British BioMedicine Institute will reach you the below assets
- Quality Editorial service
- Swift Peer Review
- E-prints Service
- Manuscript Podcast for convenient understanding
- Global attainment for your research
- Manuscript accessibility in different formats (Pdf, E-pub, Full Text)
- Unceasing customer service

Track the below URL for one-step submission
http://www.britishbiomedicine.com/manuscript-submission.aspx