Evaluation of in vivo Wound healing activity of Jasminum angustifolium linn on excision wound model in rats

Kukloria Sonam*, Singune Shantilal, Bele ,D.S, Kukloria Gagan
*Department of Pharmacology,
Charak Institute Of Pharmacy Mandleswar, Madhya Pradesh, India
*Corresponding author e-mail: drdanishmehmood@gmail.com

Received on: 17-12-2018; Revised on: 05-01-2019; Accepted on: 18-01-2019

ABSTRACT

Objective: To evaluate the wound healing effect of ethanolic and aqueous extract of dried roots of Jasminum angustifolium linn in rats.

Methods: Wound model excision wound were used in this study. The parameter studies were percentage of wound contraction and period of epithelialization in excision wound model. The ethanolic and aqueous extract of Jasminum angustifolium linn administered at 300mg/kg per day for 20 day.

Result: In excision wound model, the percentage of wound contraction was significantly (P<0.05) increased by doses of test extract on all the days. Conclusion: The results suggest that ethanol and aqueous extract of Jasminum angustifolium Linn was found to possess significant wound healing property. This was evident by decrease in the period of epithelialization, increase in rate of wound contraction. Hence Jasminum angustifolium linn could be a good wound healer agent.

Keywords: Jasminum angustifolium linn, Wound healing, Excision, Wound, % of wound contraction, Rats.

INTRODUCTION

Wounds are physical injuries that result in an opening or breaking of the skin. Proper healing of wounds is essential for the restoration of disrupted anatomical stability and disturbed functional status of the skin. Repair of injured tissues occurs as a sequence of events, which includes inflammation, proliferation, and migration of different cell types. The inflammation stage begins immediately after injury, first with vasoconstriction that favors homeostasis and releases inflammation mediators. The proliferative phase is characterized by granulation tissue proliferation formed mainly by fibroblast and the angiogenesis process. The remodeling stage is characterized by reformulations and improvement in the components of the collagen fibre that increases the tensile strength. Factors that contribute to causation and perpetuation of the chronicity of wounds include repeated trauma, poor perfusion, oxygenation, excessive inflammation. Imbalance in free radical generations and antioxidants has been observed to induce oxidative stress and tissue damage and delayed wound healing. Therefore, elimination of ROS could be an important strategy in healing chronic wounds.

MATERIAL AND METHODS

Animals care and handling

This was done as per the guidelines set by the Indian National Science Academy New Delhi India. Adult wistar rats (100-150g), were employed for wound healing activity study used. They were housed under controlled condition of temperature of (25±2)ºC, of humidity of 50% and 10-14 hr of light and dark cycles respectively. The animals were housed individually in polypropylene cages containing sterile paddy husk (procured locally) as bedding throughout the experiment and had free access to sterile food and water libitum. Animal were kept under fasting for overnight and weighted before experimental. Ethical clearance for the animal study was obtained from institutional animal Ethical Committee.
Collection and preparation of extract of Jasminum angustifolium Linn

The whole plant Jasminum angustifolium Linn. were collected from the Sitaram nursery Indore M.P. and was identified by Dr. S.K. MAHAJAN Department of botany P.G. college Khargone. M.P. India. The coarsely powdered roots (100 g) of Jasminum angustifolium were extracted to exhaustion in a soxhlet apparatus with 500 ml of ethanol.

Then the extracted material was successively extracted with ethanol for 72 hours followed by maceration with water for aqueous extract. These extracts were dried by rotary vacuum dryer. Both the extracts were stored in an air tight container for further study. The resulting extracts were dissolved in distilled water and used for animal study at the dose of 300 mg/kg, 250 mg/kg of Ethanol and aqueous extract of Jasminum angustifolium Linn.

Acute toxicity studies

Healthy wistar rats of either sex were chosen and divided into six groups (n=6). They were starved overnight. They were orally fed with graded doses of ethanolic and aqueous extract of Jasminum angustifolium. Following the administration, the animals were closely observed during the first 24 hours. Rats of either sex weighing 100-150 g were used for the study.

EXPERIMENTAL WOUND MODEL

Healthy animals were randomly allocated into six groups with six animals for wound model. Group 1 received 2 ml of 0.5% CMC by oral through intragastric tube.

Experimental Wound Model

Wounds were traced on 1 mm² graph paper on the day of wounding and subsequently at a gap period of 4 days till 12th day, then on the alternate days until healing was complete. Changes in wound area were measured regularly and the rate of wound contraction calculated as given in the formula below. Significance in wound healing of the test group is derived by comparing healed wound area on respective days with healed wound area of control group. The healed area was calculated by using sub tracing wound area from the original wound area the percentage of wound contraction was calculated using the formula:

\[ \% \text{ wound contraction} = \left( \frac{\text{Healed area}}{\text{Original wound area}} \right) \times 100 \]

Statistical Analysis

Value are expressed in mean±SEM. Result were analysed by one way analysis of (ANOVA) followed by Dunnett’s test for multiple comparisons” instead of “for multiple comparisons verses control group was done by Dunnett’s test. P value <0.05 was considered significant.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>4th day</th>
<th>8th day</th>
<th>12th day</th>
<th>16th day</th>
<th>18th day</th>
<th>20th day</th>
<th>22nd day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>22±1.1</td>
<td>40.54±0.77</td>
<td>60.54±0.77</td>
<td>71.3±0.88</td>
<td>74.01±0.53</td>
<td>79.22±2.2</td>
<td>82.13±1.1</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>30.31±0.65</td>
<td>44.53±0.3*</td>
<td>71.30±0.61*</td>
<td>93.82±1.03**</td>
<td>95.0±0.3**</td>
<td>100±0.0**</td>
<td>100±0.0**</td>
</tr>
<tr>
<td>EE(300mg/Kg)</td>
<td>31.90±0.1*</td>
<td>41.53±0.48*</td>
<td>73.64±0.12*</td>
<td>93.90±0.77**</td>
<td>95.40±0.2*</td>
<td>98.33±0.5*</td>
<td>100±0.0**</td>
</tr>
<tr>
<td>EE(250mg/Kg)</td>
<td>32.50±0.4*</td>
<td>45.03±0.51*</td>
<td>70.73±1.0*</td>
<td>93.06±0.73**</td>
<td>95.40±0.2*</td>
<td>98.05±1.2*</td>
<td>100±0.0**</td>
</tr>
<tr>
<td>EA(300mg/Kg)</td>
<td>32.03±0.2*</td>
<td>47.23±0.28*</td>
<td>73.01±0.58*</td>
<td>93.9±0.72**</td>
<td>95.0±0.3*</td>
<td>98.33±0.5*</td>
<td>100±0.0**</td>
</tr>
<tr>
<td>EA(250mg/Kg)</td>
<td>32.6±0.5*</td>
<td>47.79±0.4*</td>
<td>71.92±0.68*</td>
<td>93.7±0.73*</td>
<td>97.1±0.2*</td>
<td>98.2±1.1*</td>
<td>100±0.0**</td>
</tr>
</tbody>
</table>

The % of wound contraction was:

22±1.1, 40.54±0.77, 60.54±0.77, 71.3±0.88, 74.01±0.53, 79.22±2.2, 82.13±1.1.

RESULTS

The % of wound contraction was:

22±1.1, 40.54±0.77, 60.54±0.77, 71.3±0.88, 74.01±0.53, 79.22±2.2, 82.13±1.1 as measured on 4 day to 22 day while complete epithelization and healing were observed on day 22. The percentage rate of wound contraction in rats treated orally with JAE (300 mg/kg) was from 31.9% on day 4 to 73.64% on day 12 and 93.9% to 100% from day 14 to 22 respectively. While Vitamin E treated rats showed an increase in wound contraction from 30.31% on day 4 to 71.30% on day 12 and 93.82% to 100 from day 14 to 22, respectively.

The mean of % of wound contraction showed faster healing which was comparable with VTE treated group (table).

Table: Excision wound model induced in rats.
**DISCUSSION**

Plants have served as a good source of wound healing agents. Several studies have been conducted on herbs under a multitude of ethnobotanical grounds. A large number of plants possessing wound healing properties have been documented. Whole plant of *Jasminum angustifolium* Linn was traditionally used in the treatment of wound. The present investigation was carried out to evaluate the wound healing activity of the EEJA and AEJA in EAC wound bearing rats.

**CONCLUSION**

In conclusion, the ethanol extract of *Jasminum angustifolium* Linn was effective in wound contraction excision models. The biochemical and histological studies supported its antioxidant and hepatoprotective properties. The present work demonstrates that ethanolic and aqueous extract of roots of *Jasminum angustifolium* has wound healing activity in rat. It is concluded from the study that in excision model (ethanolic extract) showed 100% wound healing in 20 days and (aqueous extract) of roots of *Jasminum angustifolium* shows 100% wound healing activity in 22 days.

**REFERENCES**


