Screening of Wound Healing Effect of Nifedipine in Wistar Albino Rats
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Abstract: The effect of Nifedipine was studied in rats using incision wound model. Total 18 rats were divided in to three groups each of 6 rats. G-I Control, G-II-Nifedipine (2 mg/kg) and G-III- Nifedipine (4 mg/kg). 6 cm length of incision was made at para vertebral palace. Rats were given test drugs one week before incision made and one week after incision. Significant difference was observed in the tensile strength with high dose of test drug compared to low dose and control group. In conclusion, Nifedipine increased wound healing. Further studies required to find the mechanism of action.

Keywords: Anti-oxidant, healing, Incision, Nifedipine, Para vertebral, tensile strength.

INTRODUCTION
Nifedipine is a calcium channel blocker. It is most commonly used drug in various cardiovascular diseases and some of the non-cardiovascular diseases [1]. Various studies showed wound healing activity of Nifedipine in various models [2, 3]. Cellular calcium plays major role in the wound healing [4]. Nifedipine alters the intra and extra cellular calcium levels and also has anti-oxidant effects [5]. With this background the present study was planned to screen the wound healing effect of nifedipine in incision wound model in rats.

MATERIALS AND METHODS
Animals
Total 18 Wistar Albino rats weighing 250gms were included in the study. They were housed individual cages. Rats allowed free access to water and food during the study period [6].

Study groups
Group-I: Control (Normal Saline)
Group-II: Nifedipine (10 mg/kg)
Group-III: Nifedipine (20 mg/kg)

Procedure
All the drugs were administered per orally for 14 days. Rats were anesthetized during the wounding procedure. On 7th day Wound was made under aseptic conditions. Both sides of paravertebral incisions of 6 cm was made cutting through the full thickness of the skin. 6 sutures were made at each cm. On the 7th day sutures were removed and tensile strength was measured by water flow technique [7, 8].

Statistical Analysis
The data was analyzed by Statistical Package for Social Sciences (SPSS 16.0) version. One way ANOVA (Post hoc) followed by Dunnet t test applied to find the statistical significant between the groups. P value less than 0.05 considered statistically significant at 95% confidence interval.

RESULTS
Rats treated with Nifedipine showed significant difference compared to control group. Low dose Nifedipine showed less wound healing compared to high dose and it was statistically significant.
Table 1: Comparison of wound healing effect of Nifedipine

<table>
<thead>
<tr>
<th>Groups</th>
<th>Drugs administrated</th>
<th>Tensile strength (MEAN±SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group-I</td>
<td>Normal saline</td>
<td>320.45±0.34</td>
</tr>
<tr>
<td>Group-II</td>
<td>Nifedipine (2 mg/kg)</td>
<td>430.12±0.45*</td>
</tr>
<tr>
<td>Group-III</td>
<td>Nifedipine (4 mg/kg)</td>
<td>482.83±0.89*</td>
</tr>
</tbody>
</table>

(*p<0.05 significant in group-2 compared with group-1

Graph 1: Comparison of wound healing effect of Nifedipine

DISCUSSION
Tensile strength depends on the collagen content. Collagen formation directly related to the wound healing [9]. Agents stimulate the collagen synthesis plays major role in the wound healing [10]. Oxidative stress decreases the collagen formation and delay the wound healing. Antioxidants improve the wound healing by decreasing oxidative stress. Calcium levels also plays vital role in the wound healing [11]. Nifedipine is a calcium channel blocker commonly used in various cardiovascular diseases. It has anti-oxidant activity. The calcium channel blocking and anti-oxidant effect may increase the wound healing [12]. In this present study rats treated with Nifedipine showed significant wound healing effect. This can use full patients undergoing surgery with cardiovascular diseases.

CONCLUSION
Rats treated with Nifedipine showed wound healing activity. There is a further studies required to find out the mechanism of calcium channel blockers in the wound healing.

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