Scholars Journal of Applied Medical Sciences (SJAMS) **ISSN 2320-6691 (Online)**
Sch. J. App. Med. Sci., 2017; 5(6E):2432-2434 **ISSN 2347-954X (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublishers.com DOI: 10.36347/sjams.2017.v05i06.070

Original Research Article

Screening of Wound Healing Effect of Nifedipine in Wistar Albino Rats

Chakradhar T[1], Sarath Babu K[2],
[1]Professor, Department of Pharmacology, Osmania Medical College, Hyderabad, Telangana
[2]Assitant Professor, Department of Pharmacology, Sree Mookambika Institute of Medical Sciences, Kulasekharam, Kanyakumari (Dist), Tamil Nadu

***Corresponding author**
Sarath Babu K
Email: sarathgrey@gmail.com

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.

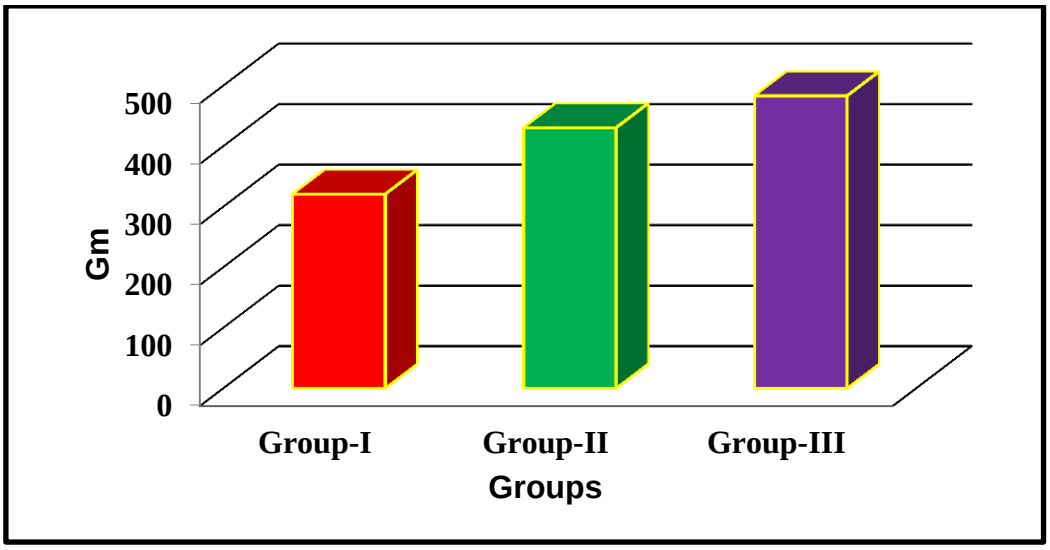
RESULTS

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

Groups	Drugs administrated	Tensile strength (MEAN±SD)
Group-I	Normal saline	320.45±0.34
Group-II	Nifedipine (2 mg/kg)	430.12±0.45*
Group-III	Nifedipine (4 mg/kg)	482.83±0.89*,#

(*p<0.05 significant in group-2 .compared with group-1
#p<0.05 significant in group-3, compared with other groups)



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.

REFERENCE

1. Seth SD, Seth S. Calcium channels and calcium channel blockers.
2. Bhaskar HN, Udupa SL, Udupa AL. Effect of nifedipine and amlodipine on dead space wound healing in rats.
3. Majid CA, Ebadi A, Eimani H. Healing effect of topical nifedipine on skin wound of diabetic rats. JFP 2012; 11(1):710-4.
4. Lee RC, Ping J. Calcium antagonists retard extracellular matrix production in connective tissue equivalent. Journal of Surgical Research. 1990 Nov 1; 49(5):463-6.
5. Srivatavanidhi, Jain JK, Dubey MP, Ragubir R. Role of free radicals scavenger in wound healing, Abstract 31st Annual of Indian Pharmacological Society 18-21st December 1998 (p 90).
6. Bagheri M, Jahromi BM, Mirkhani H, Solhjou Z, Noorafshan A, Zamani A, Amirghofran Z. Azelnidipine, a new calcium channel blocker, promotes skin wound healing in diabetic rats. Journal of Surgical Research. 2011 Jul 31; 169(1):e101-7.
7. Pawar RS, Chaurasiya PK, Rajak H, Singour PK, Toppo FA, Jain A. Wound healing activity of Sida

cordifolia Linn. In rats. Indian journal of pharmacology. 2013 Sep; 45(5):474.
8. Murthy S, Gautam MK, Goel S, Purohit V, Sharma H, Goel RK. Evaluation of in vivo wound healing activity of Bacopa monniera on different wound model in rats. BioMed research international. 2013 Jul 29; 2013.
9. Gal P, Toporcer T, Vidinský B, Mokrý M, Novotný M, Kilik R, Smetana Jr K, Gal T, Sabo J. Early changes in the tensile strength and morphology of primary sutured skin wounds in rats. Folia biologica. 2006 Jul 1; 52(4):109.
10. Berard CW, Woodward SC, Herrmann JB, Pulaski EJ. Healing of Incisional Wounds in Rats The Relationship of Tensile Strength and Morphology to the Normal Skin Wrinkle Lines. Annals of surgery. 1964 Feb; 159(2):260.
11. Rozaini MZ, Zuki AB, Noordin M, Norimah Y, Hakim AN. The effects of different types of honey on tensile strength evaluation of burn wound tissue healing. Int J Appl Res Vet Med. 2004; 2(4):290-6.
12. Kurahashi T, Fujii J. Roles of antioxidative enzymes in wound healing. Journal of Developmental Biology. 2015 Apr 27; 3(2):57-70.