VOLUME-8, ISSUE-9, SEPTEMBER-2019 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Ayurveda

EXPERIMENTAL EVALUATION OF WOUND HEALING PROPERTY OF DURVADI OIL IN WISTER ALBINO RATS

Sharma Sukrant* Dr. Sukrant Sharma M.S (ayu) Assistant professor, Jammu Institute Of Ayurveda and Research Nardini, Jammu, India Corresponding Author

Bhardwaj Ashanka Ashanka Bhardwaj MDS(oral pathologist),Jammu

Yadav Rajesh Assistant professor, SGM P.G Ayurvedic Medical College and Hospital Saheri Ghazipur U.P.

Kour Sarabjeet Kour PG scholar, Jammu Institute Of Ayurveda and Research Nardini, Jammu, India

ABSTRACT Wound (vrana) means break /destruction / rupture / discontinuity of body tissue / part of body. Sushruta samhita describes Vrana as the sign of the disease (lesion) which never disappears even after complete healing and as its imprint persist lifelong1. These descriptions match the description of a wound. Wound is a discontinuity or break in the surface epithelium. Wound healing is a mechanism whereby the body attempts to restore the integrity of the injured part. Durvadi oil is a formulation mentioned in Bhaishajya ratnavali having healing property. This is an experimental study on Wistar albino rats to find out the healing effect of Durvadi oil.There were 3 groups- normal control, standard and test, each group containing 6 rats. In control group no intervention was done. In standard and Test group were treated with Povidone iodine ointment and Durvadi oil as an external medication respectively. Study was carried out for 24 days. Observational parameters included period of epithelialisation, percentage of wound contraction periodically, hydroxyproline estimation and histopathology assessed on 24th day. Period of epithelialisation was considerably reduced in test and standard group as compared to normal control group. Hydroxylproline estimation in the test group has shown significant decrease in the concentration as compared to normal control group. Histological examination showed better wound healing profile in reference standard and test drug applied group than normal control group. Wound area contraction rate was higher in test and standard group in comparison to normal control group.

KEYWORDS : Wound, Vrana, Durvadi oil, Hydroxyproline, epithelialisation, Wistar albino rats

INTRODUCTION

Surgery is a medical specialty associated with greater risks and challenges to its practitioner yet can be highly rewarding as the prudence and dexterity of a surgeon can save the lives of many patients who otherwise may seemed to have lost all hopes of surviving. Wounds are believed to be affecting approximately 1% of the population worldwide. Whereas an Indian perspective of hospital based study shows leprosy (40%), diabetes (23%), venous disease (11%), and trauma (13%) were among important causes of lower extremity wounds. In that study, 13% of wounds were directly linked to any known cause2.Wound is a discontinuity or break in the surface epithelium3. Wound healing is a mechanism whereby the body attempts to restore the integrity of the injured part4. Active promotion of wound healing is a continuing challenge in current surgical practice. Routine antiseptic dressings though reduce the microbial colony have a deleterious effect on growing epithelium5. Antibiotic ointments will irritate the skin, slow down healing and greatly increase risk of contact dermatitis and antibiotic resistance. Because of this, they should be used when a person shows signs of infection and not as a preventive measure6. Mitigation of pain, discharge and discoloration after healing are the other important factors. The proper initial care of the fresh wound will definitely prevent the inadvertent use of the oral and systemic antibiotics. Management of wound has always been a difficult proposition in the evolution of medical practice. Only recently the medical professional and researchers have realized that spending time in search of newer antimicrobial is of no use. Thus relentless emergence of antibiotic-resistant strains of pathogens, together with the retarded discovery of novel antibiotics has led to the need to find alternative treatments7. Now the scenario is changing and the whole world is looking towards the traditional and herbal medicine for the management of infection.As the science is advanced newer remedies are tried out for speedy recovery of wounds, but the older remedies still contribute high. Ayurvedic treatises especially Sushruta samhita describes wounds elaborately, in terms of definition, etiology, classification, clinical features and also a detail management is described, in the form of Shashtiupkramas8 (60 therapeutic procedures). These principles of management are valid even today. Among these Shashtiupakrama, 7 types of Healants (Ropana) are listed using decoction(kashaya),pack (varti),paste(kalka), medicated ghee (sarpi), oil (taila),linctus(rasakriya) and dusting of drugs(avachoornana)9. In shalyatantra, ropana denotes active promotion of wound healing in a Shuddha vrana10 (uncomplicated clean ulcer or wound). Durvadi oil11 is a formulation mentioned in Bhaishajya ratnavali containing Durva svarasa, Kampillaka, Daruharidra bark powder and Tila oil as ingredients, having ropana property. This is an experimental study with an affort to evaluate the effect of healing property of Durvadi oil on clean excision wounds induced in wistar albino rats, compared to Standard (Povidone Iodine) & Control (no intervention). The objective parameters are Period of Epithelialisation, hydroxyproline estimation, histopathology study and percentage wound area contraction. Therefore, this study seeks to identify the active wound healing potential of an Ayurvedic formulation which is simple, reliable, easily available, economical and easy to use that promotes wound healing without any complications.

METHODS

A. Test drugs: Mallotus philippinensis(Kampillak phalraj12) Family-Euphorbiaceae ,100 gmBerberis aristata(Daruharidra bark13)Family-Berberidaceae, 100 gm,Cynodon dactylon(Durva juice14)Family-Graminae ,6 L Sesamum indicum(Tila oil15) Family-Pidaliceae 1.5 L
B. Standard drug: Povidone iodine ointment
C. Experimental animals: Healthy 18 albino rats of either sex with average body weight of 180-255g
D. Route of drug Administration: External Application

E. Total duration of the study : 24 days

The animals were anesthetized by using Diethyl ether as an anesthetic agent. An impression was made on the dorsal thoracic region 1 cm away from vertebral column and 5 cm away from ear on the anaesthetized rat. The particular skin area was shaved one day prior to the experiment. The skin of impressed area was excised to the full thickness to obtain a wound area of about 2x2cm2. Haemostasis was achieved by blotting the wound with cotton swab soaked in normal saline. The animals were then grouped and treated as follows:

Group I: (Normal control): No intervention
Group II: (reference standard): Povidone iodine ointment
Group III: (Test drug): Durvadi oil

PARAMETERS ESTIMATED

1. Period of Epithelialisation - falling of scab, leaving no raw wound behind has been taken as end point of complete epithelisation and the days required for this were taken as period of epithelialisation.
2. Hydroxyproline estimation of the wound bed, after the 24 days of the study.
3. Histopathological study of the wound bed, after 24 days of the study. 4. Wound area contraction - observed on 4th, 8th, 12th, 16th, 20th & 24th day of post wounding. The percentage wound contraction was assessed by noting the progressive changes in wound area plan metrically, excluding the day of the wounding. The sizes of the wounds were traced on a transparent paper every 2 days, throughout the monitoring period. The tracing was then superimposed on a 1 mm 2 graph sheet, from which the wound surface area was evaluated. The evaluated surface area was then employed to calculate the percentage of wound contraction, taking the initial size of the wound, as 100%, by using the following formula. % of wound contraction = Initial wound size - specific day wound size ÷ Initial wound size x 100

RESULT

Data was statistically analyzed as MEAN ± SEM using one way ANOVA followed by Tukey's multiple comparison test

The data shows there was decrease in number of days taken for epithelialisation in standard group and as compared to normal control. The observed decrease was found to be statistically non-significant. The data shows there was decrease in number of days taken for epithelialisation in test group when compared to control group. The observed decrease was found to be statistically non-significant. There was 1.78 % decrease in the number of days taken for epithelial formation in test group comparison to normal control.

From the data it can be observed that there was statistically non-significant decrease in the hydroxylproline concentration in standard group in comparison to normal control. The test drug administered group has shown statistically very significant decrease in the hydroxylproline concentration in comparison to normal control. There was 68.33 % decrease in test group compared to control group.

The data related to the % changes in wound contraction on 2nd day.The data shows there was increase in % wound contraction in 2nd day of standard group when compared to the normal control group, the observed increase was found to be statistically non-significant. The data shows there was increase in % wound contraction in 2nd day of test group when compared to the normal control group, the observed increase was found to be statistically non-significant. There was 126.41% increase in test group compared to control group. While compared with standard drug % wound contraction was increased. The observed increase was found to be statistically non-significant. Overall P value is 0.0986 considered not quit significant.

The data related to the % changes in wound area on 8th days. The data shows there was increase in % wound contraction on 8thday in standard group when compared to the normal control group, the observed increase was found to be statistically non-significant. The data shows there was decrease in % wound contraction in 8th day of test group when compared to the normal control group, the observed decrease was found to be statistically non-significant. There was 13.65 % decrease was noted in test group compared to control group. While compared with standard drug % wound contraction was decreased. The observed decrease was found to be statistically non-significant. Overall P value is 0.091 considered very significant.

The data related to the % wound contraction measured on 16th days.The data shows there was increase in % wound contraction on 16th day in standard group when compared to the normal control group, the observed increase was found to be statistically non-significant. The data shows there was increase in % wound contraction on 16th day of test group when compared to the normal control group, the observed increase was found to be statistically non-significant. There was 4% increase in test group compared to control group.

The data related to the % changes in wound area on 24th days has been expressed in the table 45.12. The data shows there was increase in % wound contraction in on 24th day of standard group when compared to the normal control group, the observed increase was found to be statistically non-significant. The data shows there was increase in % wound contraction in 24th day of test group when compared to the normal control group, the observed increase was found to be statistically non-significant. There was 0.47% increase in test group compared to control group. While compared with standard drug % wound contraction was increased. The observed increase was found to be statistically non-significant. Overall P value is 0. 198 considered non-significant.

CONCLUSION

Period of epithelialisation was considerably reduced in test and standard group as compared to normal control group.The estimated Hydroxyproline level was less in Durvadi oil group than standard Povidone iodine and normal Control group Histological examination showed better wound healing profile in reference standard and test drug applied group than normal control group.The percentage wound contraction was comparatively high in the test and reference standard group in the initial and at the end of the observational period as compared with normal control group. No adverse effects were detected in experimental study. Overall, experimentally Durvadi oil is a safe and effective healing oil and better compared to normal control group.

REFERENCES

1. Sushruta, Sushruta Samhita, Nibandhasamgraha commentary of Dalhanacharya and Nyayachandrika Panchika commentary of Gayadasa, editor Yadavji Trikamji Acharya,
2. ed.2014, sutra stana 21th chapter, sloka-40, Chaukhamba Sanskrit sansthan,Varanasi, Pp-824, page no.-107.Gupta SK, Shukla VK. Epidemiological Study of Wounds: An Indian Perspective, 1st ed. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd; 2007, p. 1.
3. Manipal Manual of Surgery Chief edited by Dr. K Rajgopal Shenoy and Co-edited by Dr.Anita Nileshwar, 3rd edition 2010, KMC Manipal,Pp- 969,page no.1.
4. Michael J.Earley "Wounds, tissue repair and scars" Chapter 3 in Bailey and Love's short practice of Surgery 25th edition 2008, edited by Norman S.Williams, Christopher J.k.Bulstrode and PRonan O'Connell, publice by Hodder Arnold, Hachette, UK, Pp-1513, page no.24.
5. Gregory W.Thomas, BS Leonard T. Rael, MS ,Raphael Bar-Or, BS Richard Shimonkevitz, Charles W, Mains, Denetta Sue Slone Michael L, Craun, David Bar, The journal of TRAUMA® Injury, Infection, and Critical Care, J Traum. January2009; volume 66: page no.82- 91.
6. American academy of Dermatology (February 2013),"Five things Physicians and Patients should Question" Choosing Wisely: ABIM Foundation, retrieved

5 December 2013, Sheth, V.M; Weitzul, S (2008), post-operative topical antimicrobial use" Dermatitis:contact atopic occupational, drug 19(4):181-189.
7. Rose Cooper BSc, PhD, PGCE, C Biol, MI Biol, Principal Lecturer in Microbiology, article, A review of the evidence for the use of topical antimicrobial agents in wound care.
8. Sushruta, Sushruta Samhita, Nibandhasamgraha commentary of Dalhanacharya and Nyayachandrika Panchika commentary of Gayadasa, editor Yadavji Trikamji Acharya, ed.2012, sutrastana 1st chapter, sloka-3, Chaukhamba Sanskrit sansthan Varanasi, Pp -824,page no.- 2.
9. Sushruta, Sushruta Samhita, Nibandhasamgraha commentary of Dalhanacharya and Nyayachandrika Panchika commentary of Gayadasa, editor Yadavji Trikamji Acharya, ed.2012, chikitsastana 1st chapter, sloka-8, Chaukhamba Sanskrit sansthan Varanasi, Pp -824, page no.- 397.
10. Sushruta, Sushruta Samhita, Nibandhasamgraha commentary of Dalhanacharya and Nyayachandrika Panchika commentary of Gayadasa, editor Yadavji Trikamji Acharya, sutrastana, 5th Chapter, ed.2012, Chaukhamba Sanskrit sansthan Varanasi, Pp-824, p. no.-22.
11. Bhaisajya Ratnavali of Kaviraj Govind Das Sen edited with "Siddhiprada" hindi commentary by Prof. Siddhi Nandan Misra edition 2009, vranashothadhikar 47th chapter, sloka -77,Chaukhambha Sanskrit sansthan Varanasi, Pp-1196, page no.- 827.
12. Dravyaguna Vijnana, Dr.J.L.N. Shastry, Volume 2, Reprint edition 2012, ChaukhambhaOrientalia Varanasi, Pp-1114 , page no-523.
13. Dr.J.L.N. Shastry, DravyagunaVijnana, Volume 2, Reprint edition 2012, Chaukhambha Orientalia Varanasi, Pp-1114, page no-537.
14. Dr.J.L.N. Shastry, DravyagunaVijnana, Volume 2, Reprint edition 2012, Chaukhambha Orientalia, Varanasi , Pp-1114 page no-79.
15. Dr.J.L.N. Shastry, DravyagunaVijnana, Volume 2, Reprint edition 2012, Chaukhambha Orientalia, Varanasi, Pp-1114, page no- 882.