



STUDY TO EVALUATE THE THE EFFECT AND SAFETY OF TOPICAL COLLAGEN BASED SILVER SULPHADIAZINE OINTMENT ON WOUND HEALING ; OUR EXPERIENCE OF 160 CASE

General Surgery

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ABSTRACT

This Study was conducted to evaluate the effect and safety of collagen based silver sulphadiazine on wound healing.

Method: Patients of all age and sex, having surface wounds due to trauma ,infection or chronic wounds of non specific etiology with less than or equal to 100 square cms were included. Patients with uncontrolled wound bleeding, grossly infected wounds & with diabetes mellitus were excluded. In study group, the silver sulphadiazine was applied covering wound. In control group dressing done using povidone iodine ointment. Condition of wound assessed every third day.

Result: The rate of healing in study group dressing was 64.11 mm²/ day and in control group was 40.95 mm²/ day. (P value 0.001). The healing time in study group was 21.15 days, while in control group was 26.70 days. (P value- 0.01)

Conclusion: collagen based silver sulphadiazine is safe,effective in accelerated wound healing.

KEYWORDS

Collagen, silver sulphadiazine, wound healing

INTRODUCTION

There were various methods of wound healing and the Egyptians were the first to differentiate between infected and diseased wounds compared to noninfected wounds. The 1650 B.C. Edwin Smith Surgical Papyrus, a copy of a much older document, describes at least 48 different types of wounds.

Many therapeutic methods are available to effect wound healing such as skin grafts, hydrocolloid dressings, and high-protein diets, but some may not be economically suitable for the patient and/or may be associated with complications.^{15,16,17} Similarly, the cost of methods such as negative pressure wound therapy may be prohibitive for many patients^{18,19}. A less clinically and economically complicated approach to healing chronic wounds seems necessary.

Collagen^[24,25,26,27]

Acts as sacrificial substrates for matrix metalloproteinase. Degradation products is chemotectic for variety of cells required for wound healing. It Absorbs wound exudates and Maintain moist environment for wound healing.

AIMS & OBJECTIVES

The aims of study is to evaluate the effect and safety of topical collagen based silver sulphadiazine ointment on wound healing

MATERIALAND METHODOLOGY

This study was conducted on 160 patients coming to Surgery Department, SSG Hospital and Medical College Baroda, Patients of all age groups and either sex, having surface wounds either due to trauma ,infection or chronic wounds of non specific etiology with wound area less than or equal to 100 square cms. were included in the study. Patients with uncontrolled wound healing grossly infected wounds as determined by the presence of visible pus, exudate or those with diabetes mellitus were excluded from the study. On presentation, demographic data of the patients viz. age, sex was noted and a thorough history was taken regarding the complaints and their duration and progress. Then patients were thoroughly examined for the general disease and the local condition that brought the patient to the hospital. Routine investigation like hemogram and urine analysis was done in all the patients. Special investigation depending upon the other derangements in health status of the patient was done. Wound culture sensitivity test were done in all ulcers and according to that antibiotics were given.

Patients were divided into two groups –collagen based silver sulphadiazine(test) and povidone iodine ointment (Control) by Block randomization method, each block consisting of 5 patients. Random start was ensured by tossing coin and selecting the first block, which was sulphadiazine (Test) group and then alternatively the blocks were assigned tests and controls accordingly.

Wounds were examined and washed with normal saline. Dirty wounds were debrided under local anaesthesia. Post debridement bleeding controlled using sterile gauze packing.

The two largest perpendicular diameters of the wound were measured using a measure tape in millimeters. To obtain wound area, these two diameters were multiplied and approximate wound area in mm² was obtained.

DRESSING:

TEST GROUP:-

Skin surrounding the wound was cleaned with normal saline. Wounds were debrided as and when required. Depending on the wound area, the wound received collagen based silver sulphadiazine covering whole of the wound area. The wound was covered with sterile gauze piece and dressing applied. Wounds were dressed in 48 hours or earlier, if dressing soaked.

CONTROL GROUP:-

Dressing was done as per in the test group, except that instead of collagen based silver sulphadiazine, the control group povidone iodine ointment

RESULTS & ANALYSIS

This Study was conducted on 160 patients coming to Surgery Department, SSG Hospital and Medical College Baroda, during January 2012 to OCT 2019.

Wounds were assessed with regards to granulation tissue, pain, discharge, wound area .Rate of wound healing was calculated as the difference between the primary and final wound area in mm² as a function of healing time.

(in days) and reported as mm²/day. Statistical Analysis was carried out using Student's T Test and Mann-Whitney U Test. All results were considered to be significant at the 5% critical level. P(<0.05).

OBSERVATIONS

The healing rate and time to healing in group of patients receiving collagen based silver sulphadiazine was better than those not receiving povidone iodine ointment No significant adverse events and systemic events like allergic reactions observed.

No wound infection or uncontrolled bleeding occurred during treatment and none of the subjects had local pain.



Day-1

Day-2



Day-2

Day-2

DISCUSSION

Wound healing is a complex biologic process that involves chemotaxis and division of cells (neovascularization) that comprises synthesis of extracellular matrix proteins and remodeling of tissues. Sustained skin wounds are more susceptible to bacterial contamination and more likely to foster unfavorable complications; thus, many studies have reported on efforts and products to improve healing rates which may, in turn, reduce complication rates. In our study, we evaluated the effect of collagen based silver sulphadiazine on wound healing against that of povidone iodine ointment.

The mean age of patients in Test group was 42.42 years and that in Control group was 37.10 years. P value is 0.14 i.e. >0.05. Hence the age difference between two groups was not significant.

Table 1: AGE DISTRIBUTION (years):

GROUP	MEAN	STANDARD DEVIATION	P VALUE
Collagen based ssd	42.42	16.12	0.14
Providone iodine	37.10	15.81	

on analyzing the sex distribution pattern between the Test and Control Groups. P value is >0.05. Hence the sex difference between two groups was not significant.

TABLE: 2 SEX DISTRIBUTION:

GROUP	MALE	FEMALE	P VALUE
Collagen based ssd	74	6	> 0.05
Providone iodine	74	6	

The mean primary wound area of the patients receiving collagen based ointment dressing was 1447.50 sq. mm and that of those receiving saline dressing was 1122.50 sq mm. p value being 0.07 hence the difference in primary wound area between two groups was not significant

TABLE: 3 PRIMARY WOUND AREA (sq. mm) :

GROUP	MEAN	STANDARD ERROR OF MEAN	P VALUE
Collagen based ssd	1447.5	157.86	0.07
Providone iodine	1122.50	85.89	

We calculated rate of wound healing as the difference between primary and final wound area in mm² as a function of healing time in days and expressed as mm²/day. The rate of healing in the group of patients receiving collagen based silver sulphadiazine dressing was 64.11 mm²/day. The rate of healing in the group of patients receiving saline dressing was 40.95 mm²/day. P value being less than 0.001, the difference was highly significant.

TABLE: 4 HEALING RATE (sq. mm/day):

GROUP	MEAN	STANDARD ERROR OF MEAN	P VALUE
Collagen based ssd	64.11	3.20	<0.001
Providone iodine	40.95	1.27	

The time for healing in the group of patients receiving collagen based silver sulphadiazine was 21.15 days. The time to healing in those receiving povidone iodine ointment was 26.70 days. The P value being 0.01, the difference was significant.

TABLE : 5 TIME TO HEALING (days)

GROUP	MEAN	STANDARD DEVIATION	P VALUE
Collagen based ssd	21.15	1.37	0.01
Providone iodine	26.70	1.60	

CONCLUSION

The present study of 160 patients who received collagen based silver sulphadiazine showed accelerated wound healing in comparison to the control group(dressing using povidone iodine ointment). It is an effective way of enhancing healing rates in superficial wounds. Moreover, no side effects were associated with collagen based silver sulphadiazine and it is safe and effective solution for accelerated wound healing. Limitations of this study are - single center study and various parameters affecting healing are not made constant and these may affect the healing rate hence we require multicentre trial with factor affecting healing being made constant .

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