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Research Article

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A comparative study of the effect on healing of ulcer using silver dressing

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ABSTRACT

Background: Argentanon-N contact dressings composed of knitted fabrics covered with thin coat of silver compound it provides local broad spectrum antimicrobial coverage, fractional barrier to environment pathogen. It also assists in autolysis of necrotic tissue. The patients have less pain and contracture formation.

Methods: The study was carried out on 60 patients of all age group from 1 year to 80 year. Both male and female patients were included in the study ulcer of various size and all body sites were included in the study. All patients were randomly divided into two groups viz study group in whom silver dressings were applied and control group, in whom conventional dressings were applied. Majority of the ulcers were of four week's duration in the study group as well as in the control group. Cases having diabetes mellitus and malignancy were also included in the study.

Results: No patient experienced pain on change of dressing in the study group as compared to most of the patients in the control group who experienced pain on change of dressing. In the study discharge from ulcer site had reduced with application of silver dressing as compared to conventional dressing. In the study group granulation tissue appeared earlier than in the control group. The patients in the study group were ready for skin grafting after 1 week whereas their counterparts could receive the same at the end of the second week. This is suggestive of granulation promoting activity of silver dressing. Rate of epithelialization over ulcer irrespective of age and type is more in the study group than control group. No adverse reaction was observed in study group. There was no mortality in the present series as in literature.

Conclusions: Silver dressing since it causes more rapid healing, promotes early appearance of granulation tissue, prevents development of infection and is comfortable to the patient being painless on change in all age groups and sex; irrespective of the type, size, site and duration of the ulcer and presence or absence of concomitant illness.

Keywords: Wound, Ulcer, Silver dressing

INTRODUCTION

Wound management has been a challenging task in the medical field since mankind's efforts are being regularly directed to achieve satisfactory results. Every surgeon is deeply concerned and wary about the process of healing of wound, and the response of living tissue to injury is of

prime importance to the surgeon. The purpose of surgical dressings is to provide best possible environment for the healing. Historically dressing were introduced primarily to protect the wound and many of the dressing materials were introduced empirically with the hope that it will enhance the process of healing still sometimes patient have to bear plenty of financial costs for wound care.

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Ulcer is susceptible to colonization of different microbes. This may lead to invasive wound sepsis and its complications. Topical antimicrobial are used to minimize colonization and invasive wound sepsis a wide variety of agents available for treatment of ulcer including ointments, cream, biological and non biological dressings. Topical therapeutic agents have been shown to be effective in the management of open skin wounds. These agents may assist less complicated healing and wound related morbidity. Antimicrobial property of silver is known since long time. Silver is used in burn dressing for more than half century. Application of Silver either in form of Silver Nitrate, Silver sulfadiazine on wound has very short life aid has to be re-applied frequently to achieve its benefit. If the delivery of silver on wound surface is prolonged the desired action of anti-microbial can be achieved for longer duration without need of frequent opening of dressing. Argentanon-N contact dressings composed of knitted fabrics covered with thin coat of silver compound it provides local broad spectrum antimicrobial coverage, fractional barrier to environment pathogen. It also assists in autolysis of necrotic tissue. The patients have less pain and contracture formation. In this study various types of ulcers were selected with random use of silver dressing and conventional dressings (Eusol, poviodone iodine, hydrogen peroxide), as dressing materials and they were subjected to a close clinical and histological monitoring for judging the process of healing. Comparison of the responses with the two dressing materials was done and conclusions were drawn accordingly.

METHODS

The study will be conducted in the Department of General Surgery, Dr. S. N. Medical College & Associated Group of Hospitals, Jodhpur from January 2006 to February 2007. A total of 60 patients suffering from ulcer will be taken randomly for study after explaining the procedure and motto of study. Informed consent will be taken prior to enrollment in the study.

Inclusion criteria

Patients of any age and sex, clinical diagnosis of chronic ulcer.

Exclusion criteria

Known hypersensitivity to any component of drug, an active systemic infection. immune suppression treatment in last three months, any serious preexisting cardiovascular pulmonary or immunological disease, pregnant women, lactating mother.

Patient examination

Each selected patient will be examined in detail by complete physical examination, complete history regarding age, sex, socio-economic status, rural, urban,

duration of ulcer, history of any chronic illness and treatment undertaken for illness and ulcer. The ulcer will be assessed as follows: Location of ulcer, shape and size of ulcer, edge and margins, base and floor, discharge from ulcer, depth of ulcer, surrounding skin. Any associated disease like diabetes mellitus, vascular disease, neuropathy, malignancy. This will be followed by appropriate investigation like routine haemogram, blood sugar, serum cholesterol, serum albumin, wound swabs taken from ulcer discharge from culture and sensitivity. Anemia, nutritional deficiencies and hypoprotenemia treated appropriately. The protocol to be followed in management is Local management of wound, management of associated condition, antibiotic therapy, rehabilitation, patient education and instruction.

Material used

Silver dressing (Argentanon-N) and conventional dressing as dressing with antiseptic material (Dressing with antiseptic solutions like povidone iodine, saline, eusol, etc.)Condition of wound was accessed on day 7, day 14 and day 21 pain during change on dressing epithelialization, any adverse reaction and healing recorded.

RESULTS

The distribution varied from 23.33 % (7) cases from 3rd decade to 6.67 % (2) cases each from 2nd and 8th decade of life in the study group. In the control group it varied from 30 % (9) cases from 7th decade to 3.33 % (1) case from the 6th decade of life (Table 1). In the study group 66.67% (20) cases were male and 33.33% (10) cases were female. In control groups 93.33% (28) patients were male and 6.67% (2) patients were female (Table 2). The study group included 50% (15) cases of split skin graft donor site ulcers and 50% (15) cases of superficial burn ulcers. In control group included 50% (15) cases of split skin graft donor site ulcers and 50% (15) cases of superficial burn ulcers (Table 3). The study included 50% (15) cases that had ulcer surface area less than 51 square centimeters and 6.67% (2) cases had between 51 to 100 square centimeters. 10% (3) cases had ulcer area between 101 to 150 squire centimeters and 30% (10) cases had ulcer area more than 151 squire centimeters. In control group 40% (12) patients had ulcer surface area less than 51 square centimeters. 36.67% (11) patients had ulcer area between 51 to 100 square centimeters. 10% (3) patients had ulcer area between 101 to 150 square centimeters and 13.33% (4) patients had ulcer area more than 151 square centimeters (Table 4). In the study group 23.33 % (7) cases had ulcer on the leg while 20 % (6) had ulcer on foot, 16.67% (5) had ulcer on the upper limb, 13.33% (4) cases had ulcer on the thigh, 10% (3) cases had ulcers on the chest, 6.67% (2) cases had it on the back and abdomen each while 3.33% (1) cases had ulcer on the scrotum (Table 5). The study included 10% (3) cases who had diabetes mellitus while 6.66% (2) cases had malignancy where as 83.34% (25) cases did not have

any concomitant illness. In control group included 10% (3) cases who had diabetes mellitus while 6.66% (2) cases had malignancy where as 83.34% (25) cases did not have any concomitant illness. In the control group 36.67% (11) cases had ulcer on the leg while 30% (9) cases had ulcer on foot, 16.67% (5) cases had ulcer on the upper limb, 6.67% (2) cases had ulcer on the back while 3.33% (1) cases had ulcer on the chest ,gluteal region and thigh each (Table 6). The study included 50% (15) of cases in which Amniotic Membrane applied on ulcer just after taking split skin graft (0-Day), 40% (12) cases presented with ulcer of one day duration, 6.66% (2) cases presented of two days duration and 3.33% (1) case was three days old. In control group 50% (15) of patients Amniotic Membrane applied on ulcer just after taking S.S graft (0-Day), 43.33% (13) patients presented with ulcer of one day duration, 6.66% (2) patients presented of two days duration and no patient was three days old (Table 7). No patient experienced pain on change of dressing in the study group as compared to 93.33 % (28) patients in the control group who experienced pain on change of dressing (Table 8). In the study group 96.67 % (29) patients have ulcer with discharge at one week 16.67 % (5) patients have discharge from the ulcer site. At 2nd week only 10% (3) patients have discharge from the ulcer site and at 3rd week no patient has discharge from the ulcer site.

Table 1: Percentage distribution of studied subjects according to age incidence.

A so of	Study group	p	Control gro	up
Age of patients (Years)	Number of patients (N = 30)	%	Number of patients (N = 30)	%
0-10	4	13.33	0	0
11-20	2	6.67	2	6.67
21-30	7	23.33	4	13.33
31-40	3	10	3	10
41-50	3	10	6	20
51-60	6	20	1	3.33
61-70	3	10	9	30
71-80	2	6.67	5	16.67
Total	30	100	30	100

Table 2: Percentage distribution of studied subjects according to sex ratio.

	Study group		Control grou	ир
Sex of patients	Number of patients (N = 30)	%	Number of patients (N = 30)	%
Male	20	66.67	28	93.33
Female	10	33.33	2	6.67
Total	30	100	30	100

Table 3: Percentage distribution of studied subjects according to type of ulcer.

	Study group)	Control gro	up
Type of ulcer	Number of patients (N = 30)	%	Number of patients (N = 30)	%
Postcellulitic	8	26.66	12	40
Burn	12	40	3	10
Diabetic	5	16.67	6	20
Traumatic	2	6.67	3	10
Venous	1	3.33	2	6.67
Postoperative	1	3.33	2	6.67
Bedsore	1	3.33	2	6.67
Total	30	100	30	100

Table 4: Percentage distribution of studied subjects according to size of ulcer.

Size of	Study group)	Control gro	up
ulcer (Sq. cm.)	Number of patients (N = 30)	%	Number of patients (N = 30)	%
Below 51 cm. ²	15	50	12	40
51 - 100 cm. ²	2	6.67	11	36.67
101- 150 cm. ²	3	10	3	10
Above 150 cm. ²	10	30	4	13.33
Total	30	100	30	100

Table 5: Percentage distribution of studied subjects according to site of ulcer.

	Study Grou	p	Control Gro	oup
Site of Ulcer	Number of patients (N = 30)	%	Number of patients (N = 30)	%
Chest	3	10	1	3.33
Back	2	6.67	2	6.67
Upper limb	5	16.67	5	16.67
Abdomen	2	6.67	0	0
Gluteal region	0	0	1	3.33
Scrotum	1	3.33	0	0
Thigh	4	13.33	1	3.33
Leg	7	23.33	11	36.67
Foot	6	20	9	30
Total	30	100	30	100

In the control group all the patients had discharge from the ulcer. At one week 93.33 % (28) patients had discharge from ulcer. At 2nd week still 93.33 % (28) patients had discharge from the ulcer. At 3rd week 10 % (3) patients had discharge from the ulcer (Table 9). The study suggested that in study group average per day epithelialization over burn ulcer was 4.65% where as in control group it was 3.32%. The study suggested that in study group average per day epithelialization over bed sore was found to be 4.28% where as in control group it was 1.18%. The study suggested that in study group average per day epithelialization over diabetic ulcer was found to be 3.21% where as in control group it was .78%. The study suggested that in study group average per day epithelialization over postcellulitic ulcer was found to be 2.52% where as in control group it was 0.99%. The study suggested that in study group average per day epithelialization over venous ulcer was found to be 2.38% where as in control group it was .95%. The study suggested that in study group average per day epithelialization over traumatic ulcer was found to be 2.38% whereas in control group it was 1.09%. The study suggested that in study group average per day epithelialization over postoperative ulcer was found to be 1.90% where as in control group it was 1.18% (Table 10). The study revealed that the rate of epithelialization in various age groups varied from 1.54% to 7.14% in the study group whereas in the control group it varies between 92% to 2.38% (Table 11). In the study group granulation tissue appeared as an average of 8.33 days as compared to 14.03 days in the study group. The patients in the study group ready for skin grafting after 1 week where as their counterparts could receive the same at the end of second week (Table 12). Complete healing was observed in 6.67 % (2) cases after 1 week in the study group whereas no such healing occurred in the control group (Table 13). 23.33 % (7) cases in the study group healed at the end of 2nd week whereas no such phenomenon was observed in the control group (Table 14). Healing response after 3rd week. In the study group 43.33% (13) ulcers showed complete healing as compared to 6.67 % (2) ulcer in the control group (Table 15). No adverse reaction was observed in the study group

where as in the control group 23.33 % (7) patients had adverse reactions which included itching and hyperpigmentation (Table 16).

Table 6: Percentage distribution of studied subjects according to concomitant illness.

Concomit-	Study group	Control group				
ant illness	Number of patients	%	Number of patients	%		
Diabetes	6	20	7	23.33		
Malignancy	5	16.67	0	0		
No concomitant illness	19	63.33	23	76.67		
Total	30	100.00	30	100.00		

Table 7: Percentage distribution of studied subjects according to duration of ulcer.

Duration	Study Grou	p	Control Group		
(Days)	Number of patients	%	Number of patients	%	
0-4	23	76.67	29	96.67	
4-8	3	10	1	3.33	
>8	4	13.33	0	0	
Total	30	100	30	100	

Table 8: Percentage distribution of studied subjects according to pain on change of dressing.

Pain on	Study group)	Control group		
change of dressing	Number of patients	%	Number of patients	%	
Present	0	0	28	93.33	
Absent	30	100	2	6.66	
Total	30	100	30	100	

Table 9: Distribution of patients in study and control groups according to discharge from ulcer site.

Discharge	Durati	on in stu	ıdy grou	ıp					Durati	on in c	control g	group				
from	Day 0		Day 07	7	Day 14	ļ	Day 21		Day 0		Day 07	7	Day 14		Day 21	
ulcer site	N=30	%	N=30	%	N=30	%	N=30	%	N=30	%	N=30	%	N=30	%	N=30	%
Present	29	96.67	05	16.67	03	10	00	0	30	100	28	93.33	28	93.33	03	10
Absent	1	3.33	25	83.33	27	90	30	100	00	0	02	6.67	02	6.67	27	90
Total	30	100	30	100	30	100	30	100	30	100	30	100	30	100	30	100

DISCUSSION

Patients were divided into two groups viz. study group, in whom silver dressings were applied and control group, in whom conventional dressings using antiseptic solutions like povidone iodine, saline, eusol, etc. were applied. Each group had 30 patients each. Comparison of the results of our study was done with other studies on the

subject where ever literature was available. Because of paucity of literature comparison was not possible for every single observation. In the study group 13.33% (4) patients were less than 10 years of age.6.67% (2) and 23.33% (7) patients belonged to 2nd and 3rd decade of age. 10% (3) each were from 4th, 5th and 7th decade while 20% (6) and 6.67% (2) of the patients were included from 6th and 8th decade respectively. In the control group 6.67%

(2) and 13.33 % (4) patients belonged to 2nd and 3rd decade of age. 10 % (3) patients belonged to 4th decade. 20 % (6) and 3.33 % (1) patients belonged to 5th and 6th decade of age while 30 % (9) and 16.67 % (5) of the patients were included from 7th and 8th decade respectively (Table 1). In the study group 66.67% (20) cases were male and 33.33% (10) cases were female. In control groups 93.33% (28) patients were male and 6.67% (2) patients were female (Table 2). Study group included 26.66% (8) cases of postcellulitic ulcers, 40% (12) cases of burn ulcers, 16.67% (5) cases of diabetic ulcers, 6.67% (2) cases of traumatic ulcers, 3.33% (1) case of venous ulcer ,3.33% (1) case of postoperative ulcer and 3.33% (1) case of bedsore ulcer. Control group 40% (12) cases of postcellulitic ulcers, 10% (3) cases of burn ulcers, 20% (6) cases of diabetic ulcers, 10% (3) cases of traumatic ulcers, 6.67% (2) cases of venous ulcers, 6.67% (2) cases of postoperative ulcers and 6.67% (2) case of bedsore ulcer (Table 3). The study included 50 % (15) cases that had ulcer surface area less than 51 square centimeters and 6.67% (2) cases had between 51 to 100 square centimeters.10% (3) cases had ulcer area between 101 to 150 square centimeters and 30% (10) cases had ulcer area more than 151 square centimeters. In control group 40% (12) patients had ulcer surface area less than 51 square centimeters. 36.67% (11) patients had ulcer area between 51 to 100 square centimeters. 10% (3) patients had ulcer area between 101 to 150 square

centimeters and 13.33% (4) patients had ulcer area more than 151 square centimeters (Table 4). In the study group 23.33 % (7) cases had ulcer on the leg while 20 % (6) had ulcer on foot, 16.67% (5) had ulcer on the upper limb, 13.33% (4) cases had ulcer on the thigh, 10% (3) cases had ulcers on the chest, 6.67% (2) cases had it on the back and abdomen each while 3.33% (1) cases had ulcer on the scrotum. n the control group 36.67% (11) cases had ulcer on the leg while 30% (9) cases had ulcer on foot, 16.67% (5) cases had ulcer on the upper limb, 6.67% (2) cases had ulcer on the back while 3.33% (1) cases had ulcer on the chest ,gluteal region and thigh each (Table 5). The study included 10% (3) cases who had diabetes mellitus while 6.66% (2) cases had malignancy where as 83.34% (25) cases did not have any concomitant illness. In control group included 10% (3) cases who had diabetes mellitus while 6.66% (2) cases had malignancy where as 83.34% (25) cases did not have any concomitant illness (Table 6). In present study 76.67 % (23) ulcers were 0-4 weeks duration in the study group. In the control group 96.67 % (29) ulcers were also 0-4 weeks (Table 7). No patient experienced pain on change of dressing in the study group as compared to 93.33 % (28) patients in the control group who experienced pain on change of dressing (Table 8). Muangman reported that silver dressing has an advantage of limiting the frequency of replacement of the dressing and less pain on change of dressing.1

Table 10: Percentage of rate of epithelialization in studied subjects according to type of ulcer.

	Study group		Control group		
Type of ulcer	No. of patients N=30	Average per day epithelialization	No. of patients N=30	Average per day epithelialization	
Burn	12	4.65%	3	3.32%	
Bed Sore	1	4.28%	2	1.18%	
Diabetic	6	3.21%	7	0.78%	
Postcellulitic	8	2.52%	12	0.99%	
Venous	1	2.38%	2	0.95%	
Traumatic	1	2.38%	3	1.09%	
Postoperative	1	1.90%	2	1.18%	

Table 11: Percentage distribution of studied subjects according to epithelialization in different age groups.

	Study group		Control group	
Age group (Yrs.)	No. of patients N=30	Average per day epithelialization	No. of patients N=30	Average per day epithelialization
0-10	04	7.14%	00	
11-20	02	1.54%	02	2.38%
21-30	07	4.11%	04	1.54%
31-40	03	3.32%	03	1.26%
41-50	03	2.81%	06	1.26%
51-60	06	2.81%	01	1.19%
61-70	03	2.85%	09	0.92%
71-80	02	1.90%	05	1.10%

Table 12: Comparison of appearance of granulation tissue.

Group	Appearance of Granulation Tissue (average duration in days)
Study	8.33
Control	14.03

Table 13: Percentage distribution of patients in the study and control groups after 1 week according to outcome of treatment.

Outcome	Study group		Control group	
of treatment	No. of patients	% of patients	No. of patients	% of patients
Healed	2	06.67%	00	00
Not healed	28	93.33%	30	100%
Total	30	100%	30	100%

Table 14: Percentage distribution of patients in the study and control groups after 2 week according to outcome of treatment.

Outcome	Study group		Control group	
of treatment	No. of patients	% of patients	No. of patients	% of patients
Healed	07	23.33%	00	00
Not healed	23	66.77%	30	100%
Total	30	100%	30	100%

Table 15: Percentage distribution of patients in the study and control groups after 3 week according to outcome of treatment.

Outcome	Study group		Control group	
of treatment	No. of patients	% of patients	No. of patients	% of patients
Healed	13	43.33%	02	06.67%
Not healed	17	56.67%	28	93.33%
Total	30	100%	30	100%

Table 16: Percentage distribution of studied subjects according to adverse reaction.

Adverse	Study group		Control group	
reaction	Number of Patients	%	Number of Patients	%
Present	0	0	7	23.33
Absent	30	100	23	76.67
Total	30	100	30	100

In the study group 96.67 % (29) patients have ulcer with discharge at one week 16.67 % (5) patients have discharge from the ulcer site (p<.05). At 2nd week only

10% (3) patients have discharge from the ulcer site (p <.05) and at 3rd week no patient has discharge from the ulcer site (p >.05). In the control group all the patients had discharge from the ulcer. At one week 93.33 % (28) patients had discharge from ulcer. At 2nd week still 93.33% (28) patients had discharge from the ulcer. At 3rd week 10% (3) patients had discharge from the ulcer (Table 9).

In our study maximum reduction in amount of discharge after 3 weeks of treatment (100%) occurs in all patients in the study group as compared to 27 (90%) patients in the control group.

Jorgersen Betal showed from his study that wound treated with silver dressing had minimal discharge in the silver dressing group compare to control side.² Due to discharge reduction; quality of life is also improved in the patients using silver dressing.

The study suggested that in the study group average per day epithelialization over burn ulcer was 4.65% where as in the control group it was 3.32%. The study suggested that in the study group average per day epithelialization over bed sore was found to be 4.28% where as in the control group it was 1.18%. The study suggested that in the study group average per day epithelialization over diabetic ulcer was found to be 3.21% where as in the control group it was 0.78%. The study suggested that in the study group average per day epithelialization over postcellulitic ulcer was found to be 2.52% where as in the control group it was 0.99%. The study suggested that in the study group average per day epithelialization over venous ulcer was found to be 2.38% where as in the control group it was 0.95%. The study suggested that in the study group average per day epithelialization over traumatic ulcer was found to be 2.38% where as in the control group it was 1.09%. The study suggested that in the study group average per day epithelialization over postoperative ulcer was found to be 1.90% where as in the control group it was 1.18% (p>.05) (Table 10).

In the study group 7.14% (4) patients were less than 10 years of age. 1.54% (2) and 4.11% (7) patients belonged to 2nd and 3rd decade of age. 3.32% (3) patients belonged to 4th decade. 2.81% (3) and 2.81% (6) patients belonged to5th and 6th decade of age while 2.85% (3) and 1.90% (2) of the patients were included from 7th and 8th decade respectively. In the control group 2.38% (2) and 1.54% (4) patients belonged to 2nd and 3rd decade of age 0.1.26% (3) patients belonged to 4th decade. 1.26% (6) and 1.19% (1) patients belonged to5th and 6th decade of age while 0.92% (9) and 1.10% (5) of the patients were included from 7th and 8th decade respectively (p>.05) (Table 11).

Thus increased epithelialization was found in ulcers treated with silver dressing. Silver dressing have variable

effect on various types of ulcers. Maximum benefit appears in burn ulcer.

In the study of Munter wound area was reduced by 50% with silver dressing.³ Epithelialization was more than 50% at the end of treatment. Caruso DM showed majority of wound treated with silver dressing decreased in size (70%) and increased epithelialization more than 50% with decreased exudates, decreased purulence and resolution of surface slough.

In the study group granulation tissue appeared as an average of 8.33 days as compared to 14.03 days in the control group. The patients in the study group ready for skin grafting after 1 week whereas their counterparts could receive the same at the end of second week (Table 12).

Hence granulation tissues appear faster and are of good quality in wound receiving silver dressing. This is suggestive of granulation promoting activity of silver dressing.

In the study by various authors there were variable effects of silver dressing on granulation tissue formation. In the study of Coutts P silver dressing significantly increased the rate of granulation tissue. There was an increased quality and quantity of granulation tissue. Treatment with silver dressing significantly increased number of capillaries and fibroblasts. Studies of Ziegler K showed granular tissue appear earlier and increased in wounds treated with silver dressing.⁵

Complete healing was observed in 6.67 % (2) cases after 1 week in the study group whereas no such healing occurred in the control group (p>.05) (Table 13). In the study group 23.33 % (7) cases healed at the end of 2nd week whereas no such phenomenon was observed in the control group (p<.05) (Table 14). In the study group 43.33% (13) ulcers showed complete healing as compared to 6.67 % (2) ulcers in the control group at the end of 3rd week(p<.05) (Table 15).

Oslon suggested that silver dressing provides a moist environment for wound healing combined with an effective antimicrobial agent, and this significantly accelerates healing compared with wounds dressed with conventional dressings.⁶

Karlsmark reported that silver dressing was found to be safe and performed well when used in the treatment of delayed-healing chronic venous leg ulcer. Silver dressing promotes healing and has properties with excellent exudate management.

Rayman demonstrated that silver dressing is safe and easy to use and effectively supports healing and good wound progress of diabetic foot ulcers.⁸

Munter reported that silver dressing supports faster healing of delayed healing wounds.³

No adverse reaction was observed in the study group where as in the control group 23.33 % (7) patients had adverse reactions which included itching and hyperpigmentation (Table 16).

Trop after 1 week of local treatment with silver dressing in a young ,previously healthy 17 years old boy with 30% mixed depth burns, hepatotoxicity and argyria like symptoms, a grayish discoloration of the patients face, appeared. As soon as the local application of silver dressing was aborted, the clinical symptoms and liver enzymes returned to normal values. However in our study no such toxicity developed in any of the patients. There was no mortality in the present series as in literature.

CONCLUSION

It can be concluded that silver dressing is more effective than conventional dressings since it causes more rapid healing, promotes early appearance of granulation tissue, prevents development of infection and is comfortable to the patient being painless on change in all age groups and sex; irrespective of the type, size, site and duration of the ulcer and presence or absence of concomitant illness.

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