

A comparative analysis of topical silver preparation versus conventional dressing in non healing ulcer

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Abstract

Background:The present study was conducted to compare topical silver preparation versus conventional dressing in chronic non healing ulcer. **Materials & Methods:**108 patients with chronic ulcers were divided into 2 groups of 54 each. Group I patients received silver colloid and group II patients received conventional dressing. Size of the ulcers was evaluated at regular interval. **Results:** At admission the size (cm²) of ulcer was 32.4 and 30.1 in group I and II respectively, at 2 weeks was 26.8 and 25.6, at 6 weeks was 23.5 and 20.2, at 10 weeks was 12.4 and 15.4 and at 12 weeks was 5.4 and 10.2 in group I and group II respectively. The difference was significant (P< 0.05). **Conclusion:**Silver dressing found to be effective in reducing the size of the ulcer as compared to conventional dressings.

Key words: Silver dressing, conventional dressings, Ulcer.

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Introduction

Wounds are either acute or chronic and can result from venous or arterial insufficiency, diabetes, burns, trauma, chronic pressure or surgery[1]. Antiseptic agents also may control bacterial load and prevent the development of infection but may also be toxic to fibroblasts and other viable cells[2]. However, Silver has only a very weak toxic potential and only rarely induces microbial resistance in vitro studies have demonstrated the effectiveness of silver-based dressings against pathogenic bacteria[3]. Wound healing is a complicated procedure involving a combination of activities of different tissues and cell lineages and has been the subject of concentrated research for a long time[3]. When skin is injured, bleeding occurs, which activates hemostasis, initiated by exudates with components such as clotting factors. Eventually hemostasis results in the formation of a clot

in the wound, and the bleeding stops[4]. The use of silver-releasing dressings in conjunction with debridement on wounds at risk of developing infection is beneficial[5]. Nanotechnology has facilitated the production of very small size silver particles with increasingly large surface area to volume ratios which imparts greater antimicrobial efficacy and most importantly lowers their toxicity to human tissue cell. The use of silver as a prophylactic and treatment for infection and other diseases dates back to about 1000 BC, when the ancient Greeks and the Romans used it as a disinfectant[6]. The present study was conducted to compare topical silver preparation versus conventional dressing in chronic non healing ulcers.

Material & Methods

The present study was conducted among 108 patients with chronic ulcers of both genders. All patients were informed regarding the study and their consent was obtained. Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 54 each. Group I patients received silver colloid and group II patients received conventional dressing. A thorough

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clinical examination included assessment of foot ulcer according to Meggitt Wagner Grading, examination of peripheral pulses, examination of peripheral nerves for sensory, motor or autonomic loss and systemic complications of diabetes mellitus if any. All the patients were subjected to routine investigations

including lipid profile, glycosylated hemoglobin (Hb1Ac), 24 hours urinary proteins, urinary ketone body, bacteriological culture and X-ray foot. Size of the ulcers was evaluated at regular interval. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table 1: Distribution of patients

Groups	Group I	Group II
Method	Silver colloid	Conventional dressing
M:F	24:30	28:26

Table 1 shows that there were 24 males and 30 females in group I and 28 males and 26 females in group II.

Table 2: Assessment of size of ulcer

Duration	Group I	Group II	P value
Admission	32.4	30.1	0.01
2 weeks	26.8	25.6	
6 weeks	23.5	20.2	
10 weeks	12.4	15.4	
12 weeks	5.4	10.2	

Table 2, Fig 1 shows that at admission the size (cm²) of ulcer was 32.4 and 30.1 in group I and II respectively, at 2 weeks was 26.8 and 25.6, at 6 weeks

was 23.5 and 20.2, at 10 weeks was 12.4 and 15.4 and at 12 weeks was 5.4 and 10.2 in group I and group II respectively. The difference was significant (P< 0.05).

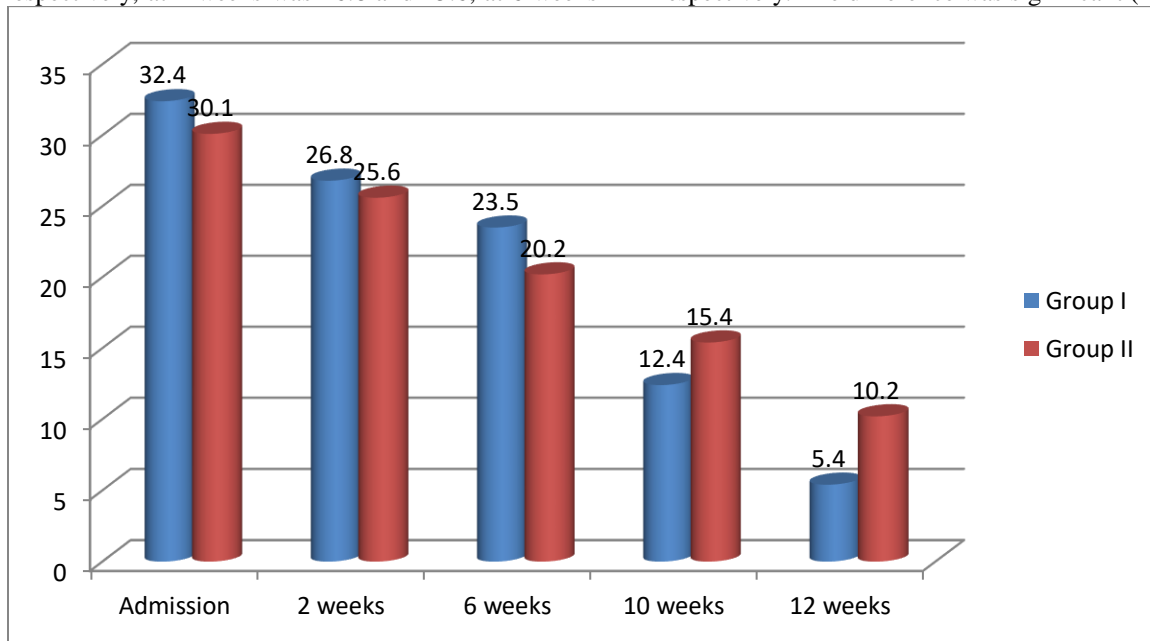


Fig 1: Assessment of size of ulcer

Discussion

Silver-containing dressings are used worldwide for the local management of colonized or infected wounds[7].

Silver has antiseptic, antimicrobial, anti-inflammatory properties and is a broad spectrum antibiotic. Silver is biologically active when it is in soluble form i.e., as

Ag⁺ or Ag⁰ clusters[8]. Ag⁺ is the ionic form present in silver nitrate, silver sulfadiazine, or other ionic silver compounds. Ag⁰ is the uncharged form of metallic silver present in nano silver[9]. The present study was conducted to compare topical silver preparation versus conventional dressing in chronic non healing ulcers.

In present study, there were 24 males and 30 females in group I and 28 males and 26 females in group II. Suhas et al¹⁰ compared the efficacy of nano silver dressing in chronic wounds with that of conventional dressings. In the study and were equally divided into – study group and control group randomly. Swab cultures were sent in all the patients. The study group received nano silver dressings while the controls received daily dressings with normal saline soaked gauzes, betadine and hydrogen peroxide. Nano silver dressings in the treatment of chronic wounds are found to be safe, effective, promoter of wound healing, promotes epithelization, accelerates healing, eliminates anaerobes and breaks microbial synergy more effectively than conventional dressing. Hence Nano silver spray prove to be more effective in the management of chronic wounds. In study group, 50% of patients stay for 3-4 weeks whereas in control group, 70% of patients stay for 5-6 weeks. 91-99% reduction in size of ulcer is seen in 43 out of 50 patients in study group whereas in control group only 8 out of 50 shows 91-99% reduction in size. We found that at admission the size (cm²) of ulcer was 32.4 and 30.1 in group I and II respectively, at 2 weeks was 26.8 and 25.6, at 6 weeks was 23.5 and 20.2, at 10 weeks was 12.4 and 15.4 and at 12 weeks was 5.4 and 10.2 in group I and group II respectively. Sharma et al[11] compared the outcome of silver colloidal based dressing in comparison to conventional dressing in management of diabetic foot ulcers. Patients were assessed on day one and then at two weeks interval for twelve weeks for ulcer size by planimetry. Out of 25 patients, 13 were randomized to silver colloid group and 12 in conventional dressing group. Age and sex distribution was comparable among two groups. Total 29 ulcers were present in silver colloidal and conventional dressing group. Mean wound area in silver colloidal dressing group and conventional dressing group on admission was 36.8 and 20.46 cm² respectively. After 12 weeks of dressing mean wound area in silver colloidal dressing group and conventional dressing group decreased by 31.52 (85.65%) and 14.04 (68.62%) and after 12-week complete healing was seen in 11 (84.62%) patients in silver colloidal dressing group and 5 (41.67) patients in conventional dressing

group. It is reported that colloidal (nano) silver particles promote wound healing and reduce scar appearance and that cytokines play an important role in these processes by their capacity to decrease wound inflammation and modulate fibrogenic cytokines. Nanosilver induces apoptosis primarily in inflammatory cells in the dermis and clearly resolve inflammation by removing the inflammatory cells safely[12].

Conclusion

Authors found that silver dressing found to be effective in reducing the size of the ulcer as compared to conventional dressings.

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