A COMPARATIVE STUDY OF EFFICACY OF SILVER & CALCIUM ALGINATE WOUND DRESSING VS POVIDONE-IODINE WOUND DRESSING IN CHRONIC NON-HEALING ULCERS

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ABSTRACT: AIM: To compare the efficacy of calcium alginate dressings with betadine dressings in the management of non-malignant non-healing ulcers **MATERIALS AND METHODS:** The study was conducted on 60 patients with non-malignant non-healing ulcers in M.S. Ramaiah Medical Teaching Hospital between June 2nd 2008 and July 31st 2010. They were randomly divided into groups of 30. History was taken and relevant investigations done to rule out any focus of infection. All 60 patients were followed up for 6 months. Patients were assessed on many factors like size of ulcer, site, culture sensitivity of swab, co-morbidities. **RESULT:** There was similar improvement in both study groups with no complications in either. All parameters were comparable. **CONCLUSION:** Silver and calcium alginate wound dressings though more expensive have comparable efficacy compared to simple betadine dressings in the treatment of non-healing ulcers

KEYWORDS: Chronic ulcers, silver calcium alginate

INTRODUCTION: Chronic wounds, defined as wounds that fail to heal after three months, are an important cause of physical and emotional stress as well financial burden, especially in patients over the age of 60 years. It is major cause of morbidity in diabetics – around 700,000 amputations are performed annually in diabetics.

In India, it is estimated that diabetic foot ulcers are responsible for 10% of hospital admissions and 40,000 legs are amputated annually due to diabetes. However studies show that with a multi-disciplinary approach and an aggressive conservative management of diabetic foot ulcers, amputation can be avoided.

Although many expensive solutions, ointments, granules and wound-care technologies are available, evidence suggests that none of these are more effective than meticulous wound care. Calcium alginate dressings have been in use for around 3 decades and have been used extensively

in skin wounds and this study compares the efficacy of these with povidone-iodine wound dressings.

MATERIALS AND METHODS: This was a prospective case-control study conducted on 60 individuals attending M.S. Ramaiah Hospital. Both out-patients and in-patients were included in the study. Subjects were randomized into two groups after age, sex and wound matching, one group receiving calcium silver alginate dressings and the other group receiving povidone iodine dressings.

INCLUSION CRITERIA:

1. Any individual with chronic non-malignant ulcer in the lower limb

EXCLUSION CRITERIA:

1. Ulcers arising from ischemia, osteomyelitis or malignancy
2. Patients on other local treatment for the ulcers

All patients who presented to the hospital with complaints of chronic non-healing ulcer were taken up as part of the study. A detailed history was taken and clinical examination was done. Relevant investigations were done. Size and other standard characteristics of the ulcers were noted and patients were randomly divided into test and control group.

Those in the test group received calcium silver alginate dressings and those in the control group received povidone iodine dressings. Patients were followed up for a period of 3-10 months. The wounds in both groups were compared on the basis of time to healing and time taken to convert infected ulcers to non-infected ulcers.

Clinico-pathological study of patients was done to identify clinical parameters like average age of patients, associated co-morbidities and average size of the ulcers and pathological data such as common micro-organism isolated from the ulcers.

Ethics: Ethical clearance was taken from the institutional review board. No ethical objections were raised as both forms of treatment were established to be effective in treatment of non-healing ulcers

Statistics: Chi square test and Fischer exact test were used to find significant association of study characteristics between control and test group. Student t test was used to find the significance of wound size before and after treatment.

RESULTS: There was no appreciable difference in the test or control group in any of the evaluated parameters. At the end of 6 months duration, 32% of the test cases had completely healed ulcers, while 24% of the controls had completely healed ulcers – there was no statistically significant difference. The remaining in both groups underwent split-skin grafting.

In both case and control groups, all wound culture-sensitivity swabs were negative at the end of 14 days. In comparison of wound size before and after dressing, there was a significant reduction in size in both the test cases (89.28±9.6%) and the control cases (87.94±8.8%), however there was no statistically significant difference between the two groups.

In the clinic-pathological study of chronic ulcers, the mean patient age was 43.6 years, with 74% of the subjects being males. 10% of the patients had ulcers at multiple sites. In addition it was

observed that 25% of the patients had vasculitis and 15% of the patients had type 2 diabetes. These co-morbidities were distributed evenly between test and control groups.

Clinically, 33% of patients had purulent discharge from the ulcer and 10% of the patients had serous discharge. Culture-sensitivity of ulcers showed multi-bacterial growth in 32% of patients. Most common multi-bacterial growth was pseudomonas aeruginosa with staphylococcus epidermidis and enterococci with streptococcus viridans. Most common monobacterial growth was Escherichia coli, staphylococcus aureus and streptococcus viridans.

DISCUSSION: Chronic non-healing ulcers are a major problem, especially in the setting of diabetes. Those who have large, deep ulcers requiring surgical management, usually split skin grafting, full thickness grafting or flap reconstruction with or without debridement. However those who have superficial ulcers or small ulcers that are not fit for definitive surgery should be managed conservatively.

This study shows that povidone iodine dressings are as effective as calcium silver alginate dressings in chronic non-healing ulcers – at a fraction of the cost. It hence supports evidence that simple, regular wounds dressings with minimal mechanical debridement are most effective in managing chronic non-healing ulcers. It is also important to avoid hasty procedures and allow the wound heal in due course, especially in patients with poor wound healing. In spite of the added anti-microbial properties of silver and the promotion of formation of granulation tissue and fibroblast proliferation by alginates, the overall efficacy of the two groups were comparable.

These results were applicable in patients with different co-morbidities such as type 2 diabetes, rheumatoid arthritis, chronic renal failure, neuropathy, gout and hemolytic anemia. The response of patients with and without co-morbidities in the test and control groups was also similar.

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Tables:

Table 1: Comparison of size (cm²) between study groups before and after dressing

Size (cm ²)	Control	Test	P value
Before dressing	20.68±8.916	17.98±15.943	0.299
After dressing	2.22±1.345	1.92±1.676	0.326
% change	87.94±8.085	89.28±9.636	0.453
Change from baseline	17.06±8.24	19.46±15.37	0.553
P value	<0.001	<0.001	

Table 2: Duration in reduction in size of non-healing ulcers

Duration of ulcer	Group	Outcome			P value
		Less than 100% decreased	100% in size	No improvement	
3 months	Test	5	3	20	0.4268
	Control	4	1	23	
4 months	Test	11	5	21	0.5485
	Control	12	4	23	
5 months	Test	27	6	3	0.3747
	Control	26	7	5	
6 months	Test	30	9	0	-
	Control	30	9	0	