ORIGINAL RESEARCH PAPER

General Surgery

AN OBSERVATIONAL STUDY OF EFFICACY OF CADEXOMER IODINE AND POVIDINE IODINE IN INFECTIVE WOUND MANAGEMENT

KEY WORDS: cadexomer iodine, ulcer, povidone iodine dressing

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ABSTRACT

Background : A wound is considered infectious if it does not heal in the typical way that most wounds do. Wounds that do not heal in three months are often classified as chronic. It appears that infectious wounds are postponed throughout one or more stages of the healing process. For example, infected wounds often stay in an inflammatory state for a long time. Chronic wounds may never fully heal or may take many years to do so. These wounds put a great deal of financial burden on the healthcare system overall and give patients great mental and physical suffering. Long-term infected wounds, wounds that need continuous care or hospitalisation, and wounds that are anticipated to heal slowly are all treated with sugar dressings. The rate of healing was assessed following the administration of povidone Iodine and Cadexomer . Cadexomer /povidone was used to manage the infection for the period while using a traditional dressing

Aims And Objectives:

1. To assess role of cadexomer iodine and povidone iodine in controlling of local infection in chronic non healing infectious wounds
2. To assess the control of infection in terms of improvement of ASEPSIS score
3. To assess rate of wound healing in terms of a)Reduction of wound size and epithelisation b)Decrease in duration of hospital stay c)Minimise extreme outcomes like amputation.

Methodology : Prospective ,observational study carried out in Dept. of General Surgery, Dr.PSIMS & RF between November 2020 and October 2022 in 80 cases of chronic non healing infectious wounds divided into two groups. **Results And Conclusion:** It is concluded that cadexomer iodine and povidine iodine is very effective in management of infective wounds.

INTRODUCTION:

A wound is considered infectious if it does not heal in the typical way that most wounds do; in most cases, wounds that do not heal in three months are classified as chronic.It seems that infectious wounds are postponed throughout one or more stages of the healing process. For example, infected wounds often stay in an inflammatory state for a long time. Chronic wounds may never fully heal or may take many years to do so. These wounds put a great deal of financial load on the healthcare system overall and give patients great mental and physical suffering. Long-lasting infected wounds, wounds that need continuous care or hospitalisation, and wounds that are anticipated to heal slowly are all treated with sugar dressings. The rate of healing was measured after the administration of povidone and cadexomer. Using a standard dressing and cadexomer/povidone, the infection was managed for the period.

AIMS AND OBJECTIVES:

1. To assess role of cadoxemer iodine and povidone iodine in controlling of local infection in chronic non healing infectious wounds
2. To assess the control of infection in terms of improvement of ASEPSIS score
3. To assess rate of wound healing in terms of
   a. Reduction of wound size and epithelisation.
   b. Decrease in duration of hospital stay.
   c. Minimise extreme outcomes like amputation.

MATERIALS AND METHODS :

Prospective ,observational study, carried out in Dept. of General Surgery , Dr. Pinnamaneni Siddhartha Institute of Medical Sciences & Research Foundation, Chinnaoutpalli, Gannavaram between November 2020 and October 2022 in 80 cases of chronic non healing infectious wounds divided into two groups – cadexomer iodine dressing group and povidone iodine dressing group.Observations

- Noting site and size of the wound.
- Observing duration of wound healing with the use of CI & PI.
- Assessing requirement of systemic antibiotics.

• Grading with ASEPSIS wound scoring system.
• Length of hospital stay.
• Statistical analysis will be carried out and all the observations and results will be evaluated.

Granulation Tissue
1. No granulation present
2. < 25% of wound is granulated
3. 25-74% of wound is granulated
4. 75-100% of wound is granulated Statistical analysis Data Entry was done using Microsoft excel 2013 and analysis done using SPSS V16.

Qualitative data was expressed in frequencies and percentages and Quantitative data in mean and standard deviation.

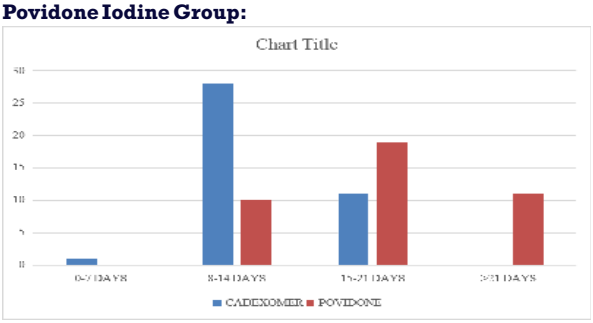
RESULTS :
In this study, the age distribution of the cadexomer iodine group is as follows: 2.5% of patients were under 20 years old, 0% were between 21 and 30 years old, 20% were between 31 and 40 years old, 30% were between 41 and 50 years old, 32.5% were between 51 and 60 years old, and 15% were over 60 years old. In the present research, the majority of patients fall within the 51–60 year age range.

In the current study, the cadexomer group population had 35% of patients with ulcers with a surface area of 1–20 cm2, 32.5% of patients with ulcers with a surface area of 21–40 cm2, 12.5% ofpatients with 41–60 cm2, 7.5% of patients with 61–80 cm2, 5% of patients with 81–100 cm2, and 7.5% of patients with > 100 cm2.

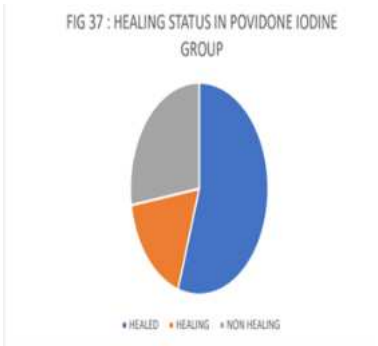
In the current study, the majority of the ulcers were located over the foot area, with 55% on the plantar and dorsum of the foot, 17.5% on the leg, 2.5% on the thigh, 12.5% on the perianal region, 12.5% on the gluteal region, and 0% on the scrotal region in the cadexomer group.

In the Povidone group, there were 57.5% of ulcers on the plantar and dorsum of the foot, 12.5% on the leg, 0% on the thigh, 15% on the perianal region, 10% on the gluteal region, and 5% on the scrotal region. The majority of the ulcers in the Povidine iodine group also affected the foot area.

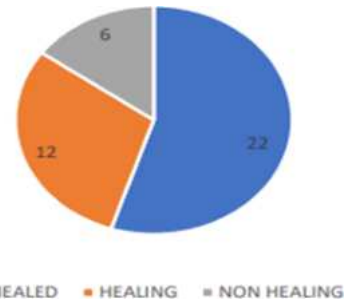
Duration Of Hospital Stay In Cadexomer Iodine And Povidone Iodine Group:



Healing Status Of Wound In Cadexomer Iodine Group:



Healing Status Of Wound In Povidone Iodine Group:



2nd Line Of Management:

2nd Line Of Management In Cadexomer Group:

Procedure	Number	Percentage %
Amputation	6	15%
Split skin graft	10	25%
Secondary suturing	1	2.5%
Debridement	0	0%
Epithelised	23	57.5%
Total	40	100%

2nd Line Of Management In Povidine Iodine Group:

Procedure	Number	Percentage
Amputation	8	20%
Split skin graft	5	12.5%
Secondary suturing	5	12.5%
Debridement	3	7.5%
Epithelised	19	47.5%
Total	40	100%

DISCUSSION:
According to the results of the present research, diabetes is the primary cause of wound development and infection in both groups of participants. Due to the fact that diabetic ulcers are a complex process. It was long thought that ischemia, trauma, and infection were the main causes of diabetic foot ulcers; however, neuropathy is now generally accepted as the primary cause.

Furthermore, arteriovenous shunting within skin microcirculation seems to be a possible side effect of autonomic neuropathy. This leads to decreased cutaneous perfusion and oxygen saturation, which exacerbates ulceration and impairs the body's ability to fight off infection.

According to a research by Leila Yazdanpanah et al. (1) on the incidence and risk factors of diabetic foot, 30% of females and 70% of men get diabetic foot where as in our current research, which showed that 22.5 percent of diabetes patients were female and 72.5 percent of diabetic patients were male.

Raju R et al(2) conducted a study to determine the efficacy of CI in the treatment of chronic ulcers, which also revealed male predominance 65.9% in their sample population which is also on par with this study population.

Gupta et al conducted a study on Comparison of the Outcomes of CI and Povidone-Iodine Ointments in Wound Management (3).The cadexomer group's wound size in the stated research was 189.35 ± 58.72 cm2, but the current study's wound size was 37.9 ± 30.4 cm2. The ulcer in the providone group measured 190.85 ± 76.28 cm2, while the ulcer in the current research measured 33.3 ± 32.85 cm2. Compared to the previous trial, the present study's small-sized ulcers healed more quickly— within two to three weeks.

In the current research, 62.5% of patients had type 2 diabetes, 12.5% had hypertension (HTN), 2.5% had peripheral vascular disease (PVD), 0% had a cerebrovascular event (stroke), and 22.5% in the cadexomer group had no co-morbidities. Diabetes was the co-morbidity that was most common.

In the povidone group, the most common co-morbidity was diabetes, with type 2 diabetes mellitusaccounting for 70% of patients, hypertension (HTN) accounting for 0%, cerebrovascular accidents (CVAs) for 5%, peripheral vascular disease (PVD) for 2.5%, and no co-morbidities accounting for 22.5% of patients.70% of the sample group was under 30 on day 10, 7.5% was between 31 and 40, and 17.5% was above 40.

In the current research, 75% of patients in the cadexomer group showed recovery from wound infection and produced excellent granulation tissue; 17.5% of patients showed no change at all, and 7.5% of patients had their wound infection worsen and their condition worsened.

Upon admission, asepsis scores of >40 were present in 30% of the povidone test group, ≤30% in 47.5%, and 31–40% in 22.5% of the group. This suggests that a mild illness affected over half of the sample group.

By the tenth day, asepsis scores for 67.5% of patients in the povidone group were < 30, 12.5% were between 31 and 40, and 20% were over 40.

In the current study, 55% of patients in the povidone group had improved wound infection management, 27.5 % of patients showed no change at all, and 17.5% of patients had worsen in wound infection and ultimately required amputation.

22 individuals out of 1662 in the Insiyah Campwala et al. (4) research have surgical site infections. Of these patients, 18 of the 22 had mild wound infections, and 2 of the 22 had moderate and severe wound infections, accounting for 9% of each. About 10.8% of patients with mild infections did not recover, whereas 50% of patients with intermediate and severe infections did not recover. It indicates patients worsened as there were less antibiotics available. These findings were contrasted to the current research, which found that the proportion of patients who worsened in the cadexomer and povidone groups was 7.5% and 17.5%, respectively. The wide range of antibiotics that are readily available is the reason.

Culture and sensitivity testing was performed in both sample groups, yielding the following findings: the proportion of patients exhibiting positive results was similar between the cadexomer and povidone groups. In both groups, 57.5 percent of patients had positive culture results.Pseudomonas aeruginosa (37.5%) and E. Coli (19.5%) were the most often isolated organisms from culture-positive lesions in both research groups.

Gram negative bacteria were more likely to be isolated from the wound swab in this investigation than gram positive bacteria, which were typically more prevalent in superficial wound infections.

In a randomised experiment comparing CI and conventional therapy for the out-patient management of chronic venous ulcers, E. SKOG et al. (5) found that 77–79 percent of the bacteria isolated from the ulcer bed were Gram positive. The most often isolated gram-positive bacterium was Staphylococcus aureus.

Roche ED et al (6), conducted a study on CI effectively reduces bacterial biofilm in porcine wounds ex vivo and in-vivo in their study gram positive bacteria (65 %) was more likely cultured, while in this study gram positive was isolated from the wound predominantly staphylococcus aureus.

In the cadexomer group, 52.5 percent of patients needed debridement, 25 percent had an abscess and needed I&D, and 22.5 percent didn't need any kind of intervention.

In a similar vein, 30% of patients in the povidone-treated group had an incision and drainage, while 45% of patients had debridement. For 25% of the population, management intervention was unnecessary.

Hospital stays in the cadexomer group were typically less than 14 days. Between 0 and 7 days, 2.5% of the sample population was sent home. In 8–14 days, 70% of the patients were discharged from the hospital. Of the patients, 27.5% were sent home in 15–21 days. No patient was kept in the hospital for more than 21 days.

Because of the cadexomer groups careful treatment plans and successful interventions, 55% of their wounds fully healed. Because 30% of them were still healing, split thickness skin grafting or subsequent skin suturing was recommended. 15% (6 patients) of the test group did not recover as intended and were consequently labelled as non-healing after receiving several treatments. Amputation was recommended for these individuals as a final option.Cadexomer functions as a broad-spectrum antibiotic due to the presence of an iodine compound. Starch polymer absorbs wound exudate and maintains a moist and dry environment for the wound. The sustained release of iodine reduces the possibility of iodine toxicity and increases fibroblastic proliferation, which in turn produces granulation tissue. This means that it can be used to promote wound healing in both non-infectious and infectious wounds by enhancing fibroblastic proliferation. For this reason, cadexomer heals wounds more quickly than other local candidates.

A split thickness skin graft and secondary suturing were performed as an additional precaution in the PI group for 17.5% of the patients who were still healing after 55% of them had totally healed. These procedures were carefully planned based on case-by-case variations. On the other hand, after many procedures, 27.5% of the patients did not recover, and severe debridement and amputation were recommended.

In CI group,57.5% of patients there was epitheliazation of the wound. 25% of the patients had satisfactory healing and underwent SSG. 2.5% of the patients required additional suturing because they had well-perfused beds, granulation tissue, and opposable wound margins. 15% of the sample group required amputation since they did not respond well to treatment. Debridement was not done on any patients.

47.5% of the wounds in the povidone group epithelialized as a result of additional treatment and wound care. To encourage healing, 7.5% had debridement to remove necrosed and diseased tissue. After receiving regular wound care, 12.5% of the patients had secondary suturing, and 12.5% had split-thickness skin grafting after sufficient granulation. After thorough examination and the determination that no alternative non-surgical option is advantageous to the wound's prognosis, 20% of the patients had their limbs amputated.

CONCLUSION:

Based on the aforementioned findings, CI is classified as a wide spectrum antibiotic since it contains iodine components, which help it fight against gram positive, gram negative, MRSA, aerobic, and anaerobic bacteria. By means of an ion exchange mechanism, cadexomer's iodine maymodify a wound's pH.

Cadexomer required fewer dressings than other local candidates because of its 36-48 hour contact time. <1% of the total furthermore, cadexomer may be used to treat non-infectious wounds that need granulation tissue because it stimulates fibroblastic proliferation, which in turn promotes granulation tissue and causes wound contraction. The patient's financial burden is reduced and the length of hospital stay is reduced. This enhances the wound's ASEPSIS score.

Povidone iodine is thought to be a very effective treatment for infectious wounds because of its broad spectrum action, low cytotoxicity, anti-inflammatory qualities, ability to penetrate biofilms, lack of associated resistance, and good tolerability.

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