Original Research Paper

Volume - 13 | Issue - 02 | February - 2023 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

General Surgery

CLINICAL STUDY OF VACCUM ASSISTED DRESSING IN MANAGEMENT OF WOUNDS

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ABSTRACT **INTRODUCTION:** Wounds are a major source of morbidity, leading to considerable disability. Vacuum-assisted closure or Negative Pressure Wound Therapy (NPWT) is a non-invasive system to deal with chronic wounds.

AIMS AND OBJECTIVES: To study the outcome of vacuum-assisted closure of wounds. To evaluate the positive impact of vacuum-assisted closure on wound healing in enhancing granulation tissue.

MATERIALS AND METHODS:

Inclusion Criteria

a. Patient more than 12 years of age

b. Patients presenting with ulcer.

Exclusion Criteria

a. Patients less than 12 years of age

b. Patients diagnosed with malignant ulcers.

c. Patients with debilitating diseases like CLD, CHF, CKD etc.

RESULTS: Most patients presenting with ulcer were in 5th decade of life (44%). Number of males are more compared to females with sex ratio M: F 2.125:1. Following VAC therapy for 3 to 6 days most of the wounds showed progress in wound healing. **CONCLUSION:** Based on the findings of this study and previous studies, VAC therapy promotes faster healing with minimal serious consequences, and so looks to be a potential option for the treatment of diverse wounds. VAC awareness and training in the use of VAC dressings will allow it to be used more frequently.

KEYWORDS : Vacuum-assisted dressing, Negative Pressure Wound Therapy, Chronic non healing wounds, Pressure sores, Diabetic ulcers

INTRODUCTION

Wounds are a major source of morbidity, leading to considerable disability and are associated with increased mortality; therefore, they significantly impact public health. Vacuum-assisted closure is a new technique in the challenging field of management of contaminated, acute and chronic wounds. Vacuum-assisted closure or Negative Pressure Wound Therapy (NPWT) is a non-invasive system that creates a localised controlled sub atmospheric pressure environment to remove blood or serous fluid from a wound or operation site.

The progress of the Wound is recorded using the parameters in the wound scoring system. Despite the significant costs involved, the technique (vacuum-assisted dressing) compares favourably in financial terms with the conventional management of difficult wounds.1

AIMS AND OBJECTIVES

1. To study the outcome of vacuum-assisted closure of wounds.
2. To evaluate the positive impact of vacuum-assisted closure on wound healing in enhancing granulation tissue.

MATERIALS AND METHODS

Source of Data

It's a prospective interventional study done on Inpatients of surgical units of santhiram medical college, Nandyal after clearance from ethical committee.

Method of collection of data

A total of 50 cases clinically presenting as ulcer fulfilling inclusion and exclusion criteria between November 2019 to October 2021 were included in the study.

Inclusion Criteria

a. Patient more than 12 years of age

b. Patients presenting with ulcer.

Exclusion Criteria

a. Patients less than 12 years of age

b. Patients diagnosed with malignant ulcers.

c. Patients with debilitating diseases like CLD, CHF, CKD etc.

RESULTS

Most patients presenting with ulcer were in 5th decade of life (44%). Number of males are more compared to females with sex ratio M: F 2.125:1.

Based on the duration of wounds, cases were grouped into 3 categories: <10 days, 10-30 days and >30 days. Most cases presented within 10 days 24(48%), 17 cases(34%) in the group >30 days and 9 cases (18%) in the group 10-30 days. Wounds were most commonly located in the leg 27(54%) followed by the foot 15 (30%),Thigh and abdomen with 4 (8%)cases each were included. 22(44%) patients included in the study had history of smoking.

TABLE 01-AGE DISTRIBUTION OF PATIENTS IN THE STUDY

Age group(years)	Males	Females	Total
≤40	04	03	07
41-50	12	10	22
51-60	11	02	13
≥60	07	01	08
Total	34	16	50

Based on etiology of wounds, which were determined by history and clinical examination,wounds were divided into Traumatic, Diabetic and Pressure sores. 25(50%) of cases fell into traumatic group and 22(44%) into diabetic and 3 (6%) into pressure sores group. Wound area 20-40 cm2 22(44%) constitute maximum number of cases followed by <20cm2 19(38%) and >40 cm2 9(18%) cases. Streptococcus is most common organism cultured from wounds (30%). Following VAC therapy for 3 to 6 days most of the wounds showed progress in wound healing.

TABLE 02- WOUND SCORES ON DAY3,6,9

WOUND SCORES	DAY 3	DAY 6	DAY 9
<3	14	0	0
3-5	36	39	23
>5	0	11	27
TOTAL	50	50	50

DISCUSSION

Delayed healing of wounds is a major health issue and a concern in the community environment, especially among the elderly, necessitating daily or more number of hospital visits. VAC therapy is an alternate to the standard/conventional wound management, which uses the negative pressure to optimise conditions for healing and fewer no of dressings are required.[2]

In our study, Mean age 49.58 yrs(range 19-80 years) and the average period of the application of vacuum-assisted wound closure was 9 days. Etiological distribution of the patients was as follows: 25 traumatic (50 %), 3 pressure sore (6 %) 22 diabetic (44 %). 4 cases of wound infections over the abdomen following laparotomy were included in traumatic group. VAC dressings were applied for 9 days. Following vacuum-assisted wound closure treatment, it is observed that wound surfaces have significantly narrowed, development of granulation tissues have improved and wound secretion has decreased. While the mean wound surface measurement value was 31.24 cm2 (14.25–52 cm2) prior to the application, it was narrowed nearly 27.63% (11–45.25 cm^2).

The study performed by Kılıç et al3 showed that 17 patient treated with vacuum-assisted wound closure were followed for average 16 days and approximately 30 % wound size reduction was achieved. Demir et al4 demonstrated that average duration of treatment was 12.4 days and average wound size reduction following treatment of 50 cases was 23 %. In a study done by Ahmad Al Fadhli et al[5] published in Indian journal of plastic surgery Dec 2009.wound size reduction varied from 20%-78%. In the current study, more than 52% of patients had wound scores more than 5 after a week of VAC treatment. The present study results regarding the decreasing would size after application of VAC is in concurrence to Tolga atay et al, kilic et al and in range with ahmad al fadhli.

The biggest issue with diabetic wounds was infection, which flared up in a few cases after closed VAC dressings were used. As a result, infected diabetic wounds did not benefit from VAC treatment. Initially, wound debridement with infection control, followed by VAC dressing, would be more effective. There were 3 cases of pressure sores 2 out of 3 wounds had wound score >5 and showed good healing It was difficult to maintain negative pressure in the VAC dressing and keep the foam in contact with the wound surface.

Philbeck and colleagues (Philbeck Jr et al. 1999)6 compared the cost effectiveness of negative pressure wound therapy (NPWT) and saline-soaked gauze. Cost analyses indicated NPWT to be more cost-effective with total treatment costs amounting to $14 USD compared with $23 USD for saline soaked gauze. Many studies on various wounds imply that VAC may be more cost effective than traditional wound care treatments since it requires fewer dressing changes and fewer reconstructive choices for wound healing. Wound recovery is faster, and treatment and hospitalisation are shorter overall. Although VAC dressings are more expensive than standard dressings, the overall cost is less.

CONCLUSION

VAC therapy is a newly evolved therapeutic option for wounds. Its introduction altered the trend of wound management. Based on the findings of this study and previous studies, VAC therapy promotes faster healing with minimal serious consequences, and so looks to be a potential option for the treatment of diverse wounds. Although the use of VAC is easy, it does need training to guarantee appropriate and competent use. The cost of VAC varies depending on the length of the hospital stay and the cost of supplies. There are few high-quality RCTs on VAC treatment for wound care that have a large enough sample size and enough power to identify differences, if any, between VAC and conventional dressings. More rigorous studies with bigger sample numbers are needed to examine the utilisation and cost-effectiveness of VAC treatment on various wound types. VAC awareness and training in the use of VAC dressings will allow it to be used more frequently.

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