Original Research Article

COMPARISON OF OUTCOMES OF VACUUM ASSISTED VERSUS CONVENTIONAL DRESSING OF CHRONIC WOUNDS-A PROSPECTIVE OBSERVATIONAL STUDY

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ABSTRACT

Background: The aim is to compare the vacuum assisted closure over conventional dressing in the management of chronic ulcers.

Materials and Methods: Present cross-sectional study conducted among 72 patients taking treatment for chronic wound who admitted/visited at General surgery department to compare the vacuum assisted closure over conventional dressing in the management of chronic ulcers. Inclusion criteria was above 18 years of age, an informed written consent has been obtained from the patient and patients with ulcer >4cm2.

Results: Mean age was almost equal but it was statistically not significant. Most common grade of ulcer was found 2 in group A and 2,3 in group B but difference was statistically not significant. Almost 1/3rd cases of group A and group B have noted vascular impairment in doppler findings but difference was statistically not significant. Highest number of ulcers with size 3 to 6 cm was observed in both the groups but difference was statistically not significant. Almost in 80.0% ulcer of group A and 50.0% of group B closed in 6th week of treatment and 88.9% ulcer of group A and 61.1% of group B closed in 8th week of treatment. Highest number of ulcers with depth 3 to 6 mm was observed in both the groups but difference was statistically not significant. Almost more 95% cases of both the group noted granulation tissue within 6 weeks. It was observed the healthy granulation tissue was rapidly appeared in cases of group A compared to group B. In 5.6% and 2.8% cases have achieved granulation tissue very late [6th week] in both the group A and B respectively. Almost more 95% cases of both the group noted infection control within 3 weeks. Almost half of the cases of group A and 1/3rd cases of group B have not noted infection.

Conclusion: Present study found that patient satisfaction on the end of follow-up was statistically significantly doubled among cases of group A compared to group B.

Keywords: Advanced Moist Wound Therapy, Vascular Endothelial Growth Factor, Vacuum-Assisted Closure, Fibroblast Growth Factors.

INTRODUCTION

The increase in the aging population is a fact that worries professionals and managers of health care systems, since "the aging of the population is accompanied by an increase in the prevalence of chronic diseases". In this context and for definition purposes, chronic wounds are those that fail to advance in the ordered reparative process to produce anatomical and functional integrity over a period of 3 months. Among these we can highlight Pressure Injuries (PI), Diabetic Ulcers and Chronic Vasculogenic Ulcers (CVU), which deserve special attention since they are more frequent and tend to be associated with common diseases in the older adult population, representing the problems that have been common in Brazilian public healthcare. The prevalence of chronic wounds varies according to conditions and etiologies, such as venous insuffiency, poor arterial perfusion, diabetes or high blood pressure. While there are few Indian studies on the epidemiology of chronic wounds, one study

estimated the prevalence at 4.5/1000 population. The incidence of acute wounds was more than double at 10.5/1000 population.[1-3]

Wound healing is a complex and dynamic process that includes an immediate sequence of cell migration leading to repair and closure. This sequence begins with removal of debris, control of infection, clearance of inflammation, angiogenesis, deposition of granulation tissue, contraction, remodelling of the connective tissue matrix, and maturation. When wound fails to undergo this sequence of events, a chronic open wound without anatomical or functional integrity results.

Saline-moistened gauze has been the standard method; however, it has been difficult to continuously maintain a moist wound environment with these dressings. Subsequently, various hydrocolloid wound gels, growth factors, enzymatic debridement compounds, hyperbaric oxygen therapy, cultured skin substitutes, and other wound therapies have been advocated. All of these therapies are associated with significant expense and are being utilized in some situations without sufficient scientific evidence in favor of their efficacy.

Negative pressure wound therapy (NPWT) is a newer non-invasive adjunctive therapy system that uses controlled negative pressure, using vacuum-assisted closure (VAC) device, to help promote wound healing by removing fluid from open wounds, preparing the wound bed for closure, reducing edema, and promoting formation and perfusion of granulation tissue.[4]

Conventional dressing is the standard method; however, maintaining a moist wound environment is difficult. Subsequently, various hydrocolloid wound gels, growth factors, enzymatic debridement compounds, hyperbaric oxygen therapy, cultured skin substitutes, and other wound therapies have been advocated. These therapies are not only expensive but also don't show sufficient scientific evidence in favour of their efficacy. Negative pressure wound therapy (NPWT) is a newer non-invasive adjunctive therapy system that uses controlled negative pressure, using vacuum assisted closure (VAC) device, to help promote faster wound healing by removing fluid from open wounds, preparing the wound bed for closure, reducing oedema, and promoting formation of granulation tissue. The use of sub atmospheric pressure devices, available commercially as VAC devices, has been shown to be an effective way to accelerate healing of various wounds.[5] The present study was conducted to assess the efficacy of vacuum assisted closure dressings as compared to conventional moist wound dressings in improving the healing process in chronic wounds and to prove that negative pressure dressings can be used as a much better treatment option in the management of chronic wounds.

MATERIALS AND METHODS

Study design: It was a prospective comparative observational study conducted at General surgery department of Medical College Hospital and Research

Study subject: Study has been included patients taking treatment for chronic wound who admitted/visited at General surgery Department at Medical College Hospital and Research Centre.

Study Group: Group A Patients treated with VAC Group B Patients treated with conventional dressings.

Sampling Technique: stratified sampling

Sampling size: Using the data from the study conducted by Lone AM et al,[6] minimum sample size required for the study is calculated using the formula

$$n = (Z\alpha + Z\beta)^2 \{P1(1-P1) + P2(1-P2)\}(P1-P2)^2$$

$Z\alpha$ = Z value of α error at 5% = 1.96,

$Z\beta$ = Z value of β error with 80% power = 0.84,

P1 = proportion of granulation achieved in wound among VAC group = 77.78% P2 = proportion of granulation achieved in wound among conventional dressing therapy group= 40.0%

$$n = (1.96+0.84)^2 \{0.77 (1-0.77)+0.4 (1-0.4)\} (0.77-0.4)^2 = 23.9 = 24$$

The calculated minimum sample has been inflated by 50% to account for anticipated subject non-response. Hence the study has been conducted in a minimum of 36 patients in each arm.

Group A: Patients treated with VAC: 36 cases

Group B: Patients treated with conventional dressings: 36 cases

Inclusion criteria:

Above 18 years of age, Patients with ulcer >4cm2

Exclusion criteria:

Malignant ulcers, Patients with active bleeding/undebrided wound, Abdominal wounds/acute wounds, Pregnant or nursing mothers, People on medications, such as corticosteroids, Immunosuppressive agents or chemotherapy, Patients with severe wound ischemia and severe neuropathy, Deep infections such as osteomyelitis and septic arthritis

Study period: February 2019- January 2020 (1 year)

Study Population: Patients with chronic wound who has been admitted in Our hospital & who fulfils inclusion criteria be the subjects.

Data Collection: The study has been presented to Institutional Ethics Committee (IEC) for ethical clearance, after getting clearance form IEC the study has been started.

Patients have been divided into Group A (patients treated with VAC) and Group B (patients treated with conventional dressings), with an equal number of patients in each group. For each patient ulcers has been treated till wound closure, either spontaneously, surgically, or until completion of the 8-week period. Cases have been allotted to each group randomly. All patients would have undergone adequate wound debridement. Patients have been assessed by the following methods: Demographic and other

information obtained, interview, wound assessment and treatment chart (used as a protocol globally for all wounds) and Visual Analogue Scale (VAS). Also, photographic and wound tracing has been done at regular intervals for both groups. Treatment schedule

Group A: Patients treated with vacuum assisted closure. Dressings have been regularly changed every 4 days. Wound tracing and photos has been taken every 8 days. Ulcers have been followed up until wound closure, either spontaneously, surgically, or until completion of the 8-week period.

Group B: Patients have been treated with conventional dressings. Daily dressings have been done. Wound tracing and photos have been taken every 8 days. Ulcers have been followed up until wound closure, either spontaneously, surgically, or until completion of the 8-week period.

Patients in both groups have been administered with insulin therapy according to their blood sugar levels and injectable antibiotics started empirically initially and then according to the culture and sensitivity report. Necessary debridement and wound toilet have been done before application of dressings. In patients undergoing vacuum assisted closure a drainage tube has been placed in the wound followed by dressing with sterile foam sheet and application of occlusive transparent film over the whole assembly. The drainage tube has been connected to a suction machine. Intermittent negative pressure of 125 mmHg was applied every 15 minutes; the suction has been stopped for 10 minutes. For conventional dressings, after wound wash, povidone soaked gauze pieces has been used for initial 48 hours followed by dressings of normal saline soaked gauze pieces, twice daily. Duration of healing has been taken in days. Both types of dressings have been applied on respective groups after their selection and all necessary information for proforma has been collected from both groups.

VAS has been used as a measure of the bother score for symptoms such as in, immobility etc. It has been used to measure patient satisfaction with the treatment plan at various intervals with the score of 0 being not satisfied and 10 being most satisfied.

Data analysis: Collected data has been entered in the excel data sheet and data analysisdone with the help of Epi. Info.7.2 software.

Statistical method: Data has been cleaned, Validated and Analysed by Epi. Info 7 software. For continuous variable range, mean and standard deviation has been calculated and for categorical variables proportion and percentage has been obtained. To know the association between dependent and independent variable chi-square, t-test applied accordingly.

RESULTS

Male: female ratio was 1:0.8 and 1:0.5 in group A and B respectively but difference between gender was statistically not significant. Highest number of study participants was noted in 50 to 59 years age in both the groups but difference was statistically not significant. Mean age was almost equal but it was statistically not significant. Most common grade of ulcer was found 2 in group A and 2,3 in group B but difference was statistically not significant.

Table 1: Demographic Distribution in patients [N=72]

Gender	.Group		P value*
	A [n=36]	B [n=36]	
Male	20 [55.6]	24 [66.7]	
Female	16 [44.4]	12 [33.3]	>0.05
Age in years			
< 40	7 [19.4]	5 [13.9]	
40 – 49	11 [30.6]	10 [27.8]	
50 - 59	18 [50]	21 [58.3]	>0.05*
Mean age ± SD	55.4 ± 8.9	56.1 ± 8.4	>0.05**
Grade of Ulcer			
1	4 [11.1]	2 [5.6]	
2	15 [41.7]	14 [38.9]	
3	11 [30.6]	14 [38.9]	
4	6 [16.7]	6 [16.7]	>0.05

Table 2: Doppler Finding [N=72].

Doppler Finding	Group		P value*
	A [n=36]	B [n=36]	
Normal	24 [66.7]	25 [69.4]	
Vascular Impairment	12 [33.3]	11 [30.6]	>0.05
Size of Ulcer [in cm]			
<1	0 [0.0]	2 [5.6]	
1–3	8 [22.2]	14 [38.9]	
3–6	20 [55.6]	15 [41.7]	
>6	8 [22.2]	5 [13.9]	>0.05
Depth of Ulcer [in mm]			
<1	0 [0.0]	0 [0.0]	
1–3	12 [33.3]	14 [38.9]	
3–6	18 [50]	16 [44.4]	
>6	6 [16.7]	6 [16.7]	>0.05

Almost 1/3rd cases of group A and group B have noted vascular impairment in doppler findings but difference was statistically not significant. Highest number of ulcers with size 3 to 6 cm was observed in both the groups but difference was statistically not significant.

Table 3: Change in size of ulcer [N=72]

Change in size of ulcer [in %]	1st Week		3rd Week		6th Week		8th Week	
	A	B	A	B	A	B	A	B
< 30	10	18	6	6	2	5	2	4
30–60	16	12	4	15	1	3	0	2
60–90	8	5	14	9	5	10	2	8
> 90	2	1	12	6	28	18	32	22

Almost in 80.0% ulcer of group A and 50.0% of group B closed in 6th week of treatment and 88.9% ulcer of group A and 61.1% of group B closed in 8th week of treatment.

Table 4: Change in depth of ulcer [N=72]

Change in depth of ulcer [in %]	1st Week		3rd Week		6th Week		8th Week	
	A	B	A	B	A	B	A	B
< 30	10	20	4	10	1	6	1	3
30–60	14	8	6	14	2	2	0	6
60–90	10	6	8	2	3	8	2	3
> 90	4	2	18	10	30	20	33	24

Highest number of ulcers with depth 3 to 6 mm was observed in both the groups but difference was statistically not significant. Almost in 80.3% ulcer of group A and 55.6% of group B closed in 6th week of treatment and 91.7% ulcer of group A and 66.7% of group B closed in 8th week of treatment.

Table 5: Appearance of healthy granulation tissue [N=72]

Group	Week				
	1st	3rd	6th	8th	Absent
A [n=36]	6 [16.7]	14 [38.9]	15 [41.7]	1 [2.8]	0 [0]
B [n=36]	4 [11.1]	12 [33.3]	14 [38.9]	4 [11.1]	2 [5.6]

In 2.8% and 11.1% cases have appear granulation tissue very late [8th week] in both the group A and B respectively. Almost more 95% cases of both the group noted granulation tissue within 6 weeks. It was observed the healthy granulation tissue was rapidly appeared in cases of group A compared to group B. In 5.6% and 2.8% cases have achieved granulation tissue very late [6th week] in both the group A and B respectively.

Table 6: Infection control [N=72]

Group	Week					
	1st	3rd	6th	8th	No Infection	Not Controlled
.A	10 [27.8]	8 [22.2]	2 [5.6]	0 [0]	16 [44.4]	0 [0]
B	8 [22.2]	14 [38.9]	1 [2.8]	0 [0]	13 [36.1]	0 [0]

Almost more 95% cases of both the group noted infection control within 3 weeks. Almost half of the cases of group A and 1/3rd cases of group B have not noted infection. It was observed the infection control was rapidly controlled in cases of group A compared to group B. Also infection was not noted in more among cases of group A compared to group B.

Table 7: Pain score by Visual analogue scale [N=72]

Pain Score	1st Week		3rd Week		6thWeek		8th Week	
	A	B	A	B	A	B	A	B
<3	22	23	25	27	30	32	33	34
3–6	7	3	6	3	5	2	3	2
6–8	6	8	4	5	1	2	0	-
9-10	1	2	1	1	0	0	0	0

Pain score was higher among the cases of group B compared to group A. Only 1/10th cases of both the groups have statistically significantly least happy about treatment satisfaction. Almost 4/5th cases of group A and almost half cases of group B have statistically significantly highest satisfaction.

Table 8: Overall patient satisfaction at end of follow-up [N=72]

Score	A [n=36]	B [n=36]	P value*
< 3 [lease happy]	1 [8.3]	4 [11.1]	

3–6	2 [5.6]	8 [22.2]	
6–8	7 [19.4]	8 [22.2]	
9 - 10	26 [72.2]	16 [44.4]	0.04

Present study found that patient satisfaction on the end of follow-up was statistically significantly doubled among cases of group A compared to group B.

DISCUSSION

Present cross-sectional study conducted among 72 patients taking treatment for chronic wound who admitted/visited at General surgery Department with aim to compare the vacuum assisted closure over conventional dressing in the management of chronic ulcers. Inclusion criteria were above 18 years of age, an informed written consent has been obtained from the patient and patients with ulcer >4cm2.

Negative pressure wound therapy (NPWT) is a newer non-invasive adjunctive therapy system that uses controlled negative pressure, using vacuum-assisted closure (VAC) device, to help promote wound healing by removing fluid from open wounds, preparing the wound bed for closure, reducing edema, and promoting formation and perfusion of granulation tissue. NPWT can be used to treat Charcot neuroarthropathy wounds produced as a result of neuropathy and deformity, following debridement of infection or amputation, and in reconstructive soft tissue and osseous procedures. Study shows that 55.6% & 44.4% participants of group A and 66.7% &33.3% of group B were male and female respectively [p>0.05]. Present study found that male: female ratio was 1:0.8 and 1:0.5 in group A and B respectively but difference between gender was statistically not significant. Similar observation also found in study done by Lone AM et al,[6] Gupta V et al,[5] Richhariya A et al,[7] Siddha LV et al,[8] Chandrashekar S et al,[9] and Koppad SN et al.[10]

Our study shows that 19.4%, 30.6%, 50.0% participants of group A and 13.9%,27.8%, 58.3% of group B belonged to age group <40%, 40-49, 50-59 years respectively [p>0.05]. Mean age was 55.4 ± 8.9 years and 56.1 ± 8.4 years in group A and group B respectively [p>0.05]. Chronic leg ulcers affect 0.6–3% of those aged over 60 years, increasing to over 5% of those aged over 80 years. CLU is a common cause of morbidity, and its prevalence in the community ranges from 1.9% to 13.1%. It is thought that the incidence of ulceration is rising as a result of aging population and increased risk factors for atherosclerotic occlusion such as smoking, obesity, and diabetes. In the course of a lifetime, almost 10% of the population will develop a chronic wound, with a wound-related mortality rate of 2.5%.

Present study found that highest number of study participants was noted in 50 to 59 years age in both the groups but difference was statistically not significant. Mean age was almost equal but it was statistically not significant. Similar observation was also noted by Lone AM et al,[6] and Bagul A et al.[11] Sightly lower mean age was noted by study done by Gupta V et al,[5] and higher mean age noted in study done by Janugade HB et al.[4]

Our study shows that 11.1%, 41.7%, 30.6%, 16.7% participants of group A and5.6%, 38.9%, 38.9%, 16.7% of group B belonged to ulcer grade 1,2,3,4 respectively [p>0.05]. The evaluation and classification of diabetic foot ulcers are essential in order to organize the appropriate treatment plan and follow up. The management of the DFU is largely determined by its severity (grade), vascularity of the limb, and the presence of Infection. Present study found that most common grade of ulcer was found 2 in group A and 2,3 in group B but difference was statistically not significant. These findings are correlate with the study done by Lone AM et al,[6] Singh B et al,[12] Bagul A et al,[11] observed that Stage B grade 2 according to UT classification (64% Vs 63.6%), while 28% and 18.2% were of stage B grade 1.

Our study shows that 66.7%, 33.3% participants of group A and 69.4%, 30.3%of group B have noted normal and vascular impairment doppler finding respectively [p>0.05]. A large part of the venous insufficiency causing venous leg ulcers is superficial and suitable for varicose vein surgery. In patients with chronic leg ulcers most reflux affects the superficial system and is potentially suitable for surgical correction. Present study found that almost 1/3rd cases of group A and group B have noted vascular impairment in doppler findings but difference was statistically not significant.

Our study shows that 0.0%, 22.2%, 55.6%, 22.2% participants of group A and5.6%, 38.9%, 41.7%, 13.9% of group B have ulcer size <1,1-3,3-6,>6 cm respectively [p>0.05]. Study shows that 10, 16, 8, 2 and 18, 12, 5, 1 participants have change in ulcer size in 1st week was < 30,30 – 60, 60 – 90, > 90 % respectively. Almost 6, 4, 14, 12 and 6, 15, 9, 6 participants have change in ulcer size in 3rd week was < 30,30 – 60, 60 – 90, > 90 % respectively. Almost 2, 1, 5, 28 and 5, 3, 10, 18 participants have change in ulcer size in 6th week was < 30,30 – 60, 60 – 90, > 90 % respectively. Almost 2, 0, 2, 32 and 4, 2, 8, 22 participants have change in ulcer size in 1st week was < 30,30 – 60, 60– 90, > 90 % respectively. The measurement of pressure ulcer size can be used by healthcare professionals for recording and monitoring the progression and healing of a pressure ulcer. Recording this accurately can allow an assessment to be made as to whether a treatment is effective in promoting healing, by reducing the size of the pressure ulcer. Obtaining and recording a quantitative assessment of healing and reduction in size was particularly important where care was being provided by multiple healthcare professionals, as this would allow for consistent reporting of changes in

pressure ulcer size, and thus a reduction in healthcare professional subjectivity.

Present study found that highest number of ulcers with size 3 to 6 cm was observed in both the groups but difference was statistically not significant. Almost in 80.0% ulcer of group A and 50.0% of group B closed in 6th week of treatment and 88.9% ulcer of group A and 61.1% of group B closed in 8th week of treatment. The physician should note the number, location, and size (length, width, and depth) of ulcers and assess for the presence of exudate, odor, sinus tracts, necrosis or eschar formation, tunneling, undermining, infection, healing (granulation and epithelialization), and wound margins. Most importantly, the physician should determine the stage of each ulcer. Lone AM et al,[6] observed that Wound size decreased in 22 (78.6%) patients in Group A as compared to 15 (53.6%) patients in Group B. The majority of wounds in Group A (81.8%) got closed in 5 weeks as compared to only 60% in Group B in 8 weeks. McCallon SK et al,[13] observed an average decrease of 28.4% (9 24.3) in wound size in the VAC group as compared to 9.5% (9 16.9) average increase in wound size in the control group (treated by saline-moistened gauze dressings). Gupta V et al,[5] noted that the shrinkage of wound area was significantly more in Group A as compared to Group B (86.6±6.59 vs. 125.9±15.28 cm2). Healing was achieved in minimum of 10 days and maximum of 45 days in Group A and minimum of 21 days and maximum of 56 days in Group B. The mean duration of wound healing in Group A and Group B was 27.6 ± 9.42 and 41.2 ± 10.75 days respectively.

Our study shows that 0.0%, 33.3%, 50.0%, 16.7% participants of group A and 0.0%, 38.9%, 44.4%, 16.7% of group B have ulcer depth <1,1-3,3-6,>6 mm respectively [p>0.05]. Study shows that 10, 14, 10, 4 and 20, 8, 6, 2 participants have change in ulcer depth in 1st week was < 30,30 – 60, 60 – 90, > 90 % respectively. Almost 4, 6, 8, 18 and 10, 14, 2, 10 participants have change in ulcer depth in 3rd week was < 30,30 – 60, 60– 90, > 90 % respectively. Almost 1, 2, 3, 30 and 6, 2, 8, 20 participants have change in ulcer depth in 6th week was < 30,30 – 60, 60 – 90, > 90 % respectively. Almost 1, 0, 2, 33 and 3, 6, 3, 24 participants have change in ulcer depth in 1st week was < 30,30 – 60, 60– 90, > 90 % respectively. Present study found that highest number of ulcers with depth 3 to 6 mm was observed in both the groups but difference was statistically not significant. Almost in 80.3% ulcer of group A and 55.6% of group B closed in 6th week of treatment and 91.7% ulcer of group A and 66.7% of group B closed in 8th week of treatment. So, the decreasing in depth of ulcer rapidly in VAS group than conventional group which correlate with the study done by Bagul A et al.[11]

Lone AM et al,[6] and Mark TE et al,[14] had also observed that the wound volume and depth decreased significantly in VAC dressings as compared to moist gauze dressings. Nagaraj S et al,[15] study assessing the feasibility and efficacy of Topical Negative Pressure (TNP) dressing using a locally constructed TNP device and comparing it with regular gauze dressings for large wounds reported average duration of hospital stay was minimum of TNP Dressing was 28.21 days and in Conventional Dressing was 37.28 days.

Koppad SN et al,[16] prospective randomized observational study evaluating the efficacy of topical negative pressure dressing with conventional moist wound dressings in healing of wounds reported mean duration of number of days of hospital stay in the study group is 42.36 ± 13.78 and 46.76 ± 28.36 in the control group. Armstrong and Lavery,[17] also observed that the use of negative pressure therapy resulted in an increased rate of granulation tissue formation and a higher proportion of healed wounds compared to saline gauze dressings. Sepulveda G et al,[18] have found that NPWT is superior to conventional gauze dressings in decreasing wound dimensions, achieving complete wound healing, wound bed preparation at a faster rate and lower incidence of reamputations.

Our study shows that 16.7% & 11.1% participants in 1stweek, 38.9% & 33.3%in 2nd week, 41.7% & 38.9% in 6th week, 2.8% & 11.1% in 8th week of group A and B have appear health granulation tissue respectively. Almost 5.6% cases of group B have not appeared healthy granulation tissue. Present study found that in 2.8% and 11.1% cases have appear granulation tissue very late [8th week] in both the group A and B respectively. Almost more 95% cases of both the group noted granulation tissue within 6 weeks. It was observed the healthy granulation tissue was rapidly appeared in cases of group A compared to group B. These observation correlate with the study done by Lone AM et al,[6] Bagul A et al,[11] and Janugade HB et al.[14]

Our study shows that 27.8% & 22.2% participants in 1stweek, 22.2% & 38.9%in 2nd week, 5.6% & 2.8% in 6th week, 0.0% & 0.0% in 8th week of group A and B have controlled on infection respectively. Almost 44.4% and 36.1% cases of group A and B have not noted infection. Present study found that in 5.6% and 2.8% cases have achieved granulation tissue very late [6th week] in both the group A and B respectively. Almost more 95% cases of both the group noted infection control within 3 weeks. Almost half of the cases of group A and 1/3rd cases of group B have not noted infection. It was observed the infection control was rapidly controlled in cases of group A compared to group B. Also infection was not noted in more among cases of group A compared to group B.

Wound healing is a complex and dynamic process that includes an immediate sequence of cell migration leading to repair and closure. This sequence begins with removal of debris, control of infection, clearance of inflammation, angiogenesis, deposition of granulation tissue, contraction, remodeling of the connective tissue matrix, and maturation. When wound fails to undergo this sequence of events, a

chronic open wound without anatomical or functional integrity results.

Our study shows that 22, 7, 6, 1 and 23, 3, 8, 2 participants have pain score in1st week was < 3,3 – 6, 6 – 8, 9-10 respectively. Almost 25, 6, 4, 1 and 27, 3, 5, 1 participant have pain score in 2nd week was < 3,3 – 6, 6 – 8, 9-10 respectively. Almost 30, 5, 1, 0 and 32, 2, 2, 0 participants have pain score in 1st week was < 3,3 – 6, 6 – 8, 9- 10 respectively. 33, 3, 0, 0 and 34, 2, 0, 0 participants have pain score in 1st week was < 3,3 – 6, 6 – 8, 9-10 respectively. Present study found that pain score was higher among the cases of group B compared to group A. Chronic wounds often remain in the inflammatory stage for too long and may never heal or may take years. Chronic wound patients often report pain as dominant in their live. Chronic ulcer symptoms usually include increasing pain, friable granulation tissue, foul odour, and wound breakdown instead of healing.

Our study shows that 8.3%, 5.6%, 19.4%, 72.2% cases of group A and 11.1%,22.2%, 22.2%, 44.4% of group B have satisfaction score < 3 [lease happy], 3 – 6, 6 – 8, 9– 10 respectively [p<0.05]. Present study found that only 1/10th cases of both the groups have statistically significantly least happy about treatment satisfaction. Almost 4/5th cases of group A and almost half cases of group B have statistically significantly highest satisfaction. Present study found that patient satisfaction on the end of follow-up was statistically significantly doubled among cases of group A compared to group B.

CONCLUSION

Wound healing is a complex and dynamic process that includes an immediate sequence of cell migration leading to repair and closure. This sequence begins with removal of debris, control of infection, clearance of inflammation, angiogenesis, deposition of granulation tissue, contraction, remodeling of the connective tissue matrix, and maturation. When wound fails to undergo this sequence of events, a chronic open wound without anatomical or functional integrity results. Negative pressure wound therapy (NPWT) is a newer non-invasive adjunctive therapy system that uses controlled negative pressure, using vacuum-assisted closure (VAC) device, to help promote wound healing by removing fluid from open wounds, preparing the wound bed for closure, reducing edema, and promoting formation and perfusion of granulation tissue. Study was conducted with the aims to compare the vacuum assisted closure over conventional dressing in the management of chronic ulcers and objectives to compare the wound healing between vacuum assisted closure over conventional dressings in the management of chronic ulcer in the following terms: Change in size, Change in depth, Appearnace of granulation tissue, Pain score, Decrease in infection, Overall patient satisfaction and objectives.

REFERENCES

1. Duim E, FHC Sá, YAO Duarte, RCB Oliveira, ML Lebrão. Prevalence and characteristics of lesions in elderly people living in the community. Rev Esc Enferm USP. 2015;49(n.spe):51-7.
2. Brito KKG, Sousa MJ, Sousa ATO, Meneses LBA, Oliveira SHS, Soares MJGO. Feridas crônicas: abordagem da Enfermagem na produção científia da pós-graduação. Rev Enferm UFPE. 2013; 2(7):414-21.
3. Vieira CPB, Araújo TME. Prevalence and factors associated with chronic wounds in older adults in primary care. Rev Esc Enferm USP. 2018;52:e03415.
4. Janugade HB, Chabbra RS, Das AG, Surushe A, Saygaonkar H. Outcomes of VAC versus conventional dressings in patients with lower limb ulcer. Int Surg J 2018;5:1792-6.
5. Gupta V, Kaur J. Assessment and Comparison of Efficacy of Vacuum Assisted Closure and Conventional Dressings in the Management of Infected Wounds. Int J Res Health Allied Sci 2019; 5(2):51-54.
6. Lone AM, Zaroo MI, Laway BA, Pala NA, Bashir SA, Rasool A. Vacuum-assisted closure versus conventional dressings in the management of diabetic foot ulcers: a prospective case-control study. Diabetic Foot & Ankle 2014, 5: 23345
7. Richhariya A, Amarjot S, Richhariya M, et al. A study to evaluate the clinical efficacy of negative pressure wound therapy vis-à-vis saline moist gauze dressing. Indian journal of applied research. 2017; 7(11):281-2.
8. Siddha LV, Shetty SK, Varghese T. Efficacy of Modified Vacuum Assisted Closure in Wound Healing. Int J Sci Stud. 2015; 2(11):52-9.
9. Chandrashekar S, Veena V. Negative pressure wound therapy in surgical wounds: a prospective comparative study. Int Surg J. 2017; 4:3272-6.
10. Koppad SN, Badiger S, Desai M, et al. Comparative analysis of the efficacy of topical negative pressure dressing with conventional wound dressing in wound healing. Int Surg J. 2016; 3:1287-91.
11. Bagul A, Narwade N, Bhupatkar A, Murali S, Shah Y. Is vacuum assisted closure dressing better than conventional management of diabetic wounds? Int Surg J 2018;5:2199-204.
12. Singh B, Sharma D, Jaswal KS. Comparison of negative pressure wound therapy versus conventional dressings in the management of chronic diabetic foot ulcers in a tertiary care hospital in North India. Int J Sci Res. 2017;6(8).
13. McCallon SK, Knight CA, Valiulus JP, Cunningham MW, McCulloch JM, Farinas LP. Vacuum-assisted closure versus saline-moistened gauze in the healing of postoperative diabetic foot wounds. Ostomy Wound Manage. 2000 Aug;46(8):28-32.
14. Mark TE, Kellie RB, Gary RS, Jonathan BT, Robert AC. Prospective randomized evaluation of negative pressure wound dressing for diabetic foot wounds. Ann Vasc Surg 2003; 17:645-9.
15. Nagaraj S, Hosmani R, Shankar JC. Negative Pressure Wound Therapy versus Conventional Wound Therapy in Large Wounds. International Journal of Scientific and Research Publications. 2015; 5(5):1-10.
16. Koppad SN, Badiger S, Desai M, et al. Comparative analysis of the efficacy of topical negative pressure dressing with conventional wound dressing in wound healing. Int Surg J. 2016; 3:1287-91.
17. Armstrong DG, Lavery LA. Diabetic Foot Study Consortium. Negative pressure wound therapy after partial diabetic foot amputation: a multicentre randomized controlled trial. Lancet. 2005;366:1704-10.
18. Sepúlveda G, Espíndola M, Maureira M, Sepúlveda E, Fernández JI, Oliva C, et al. Negative-pressure wound therapy versus standard wound dressing in the treatment of diabetic foot amputation: a randomized controlled trial. CIR ESP. 2009;86:171 -7.