www.jmscr.igmpublication.org
Impact Factor (SJIF): 6.379
Index Copernicus Value: 71.58
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v6i4.15

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Study of Vaccum Assisted Closure Dressing Over Conventional Gauze Dressing in Metropolitan Tertiary Care Hospital

Authors
Kailas B. Kanthewad, S.R. Bhagvat

Introduction

Different kinds of soft tissue defects in the limbs can cause lots of clinical problems which are difficult to solve the situation becomes more bad when wounds infected or are with exposed of tendons or bones.

Previously the wounds were treated with debridement to gain proliferation of granulation tissue and then closure of wounds with skin grafts. The wound is very and the leakage of fluids its odour will lead to painful and inconvenient to both doctors and patients. The dressing needs to be changed regularly and it spends time. it also cause slow growth of granulation tissue too much infective liquid and easy to infect.

so as to avoid all the these in past 20yrs many new modality treatment appears and vac was invented because of this and now use routinely in which wounds is cleared by continuous suction to remove necrotic tissue and infective liquids. it also increases the local blood flow of wound and stimulate the growth of granulation tissue and decrease bacterial count and increases factors which are benefited for wound healing.. so now commonly used. i will study these vac dressing advantages on conventional wound dressing.

Diabetic foot ulcers are a significant health problem affecting more than 1 million patients at some point in their life time.

India currently leads the world with an estimated 41 million people with diabetes; this figure is predicted to increase to 66 million by 2025. The diabetes epidemic is more pronounced in urban areas in India, where prevalence rates of diabetes are roughly double than those in rural areas. The prevalence of diabetes in adults is about 2.4%rural and 4.0-11.6% in urban dwellers. High frequencies of impaired glucose tolerance, shown by the above studies ranging from 3.6 – 9.1% indicate the potential for further rise in the prevalence of diabetes mellitus in the coming years.

The life time risk of a person with diabetes developing a foot ulcer could be as high as 25%.Lack of trained professionals in diabetes foot care in India and the profession of podiatry being non – existent compound the problem further.

Diabetic foot is a group of syndrome in which neuropathy, ischemia, and infection lead to tissue breakdown resulting in morbidity and possible amputation.

Diabetic foot is one of the most devastating chronic complications of diabetes and is the leading cause of lower limb amputation. Although population based data are not available, rough

estimates indicate that in India approximately 45,000 legs are amputated every year, and the numbers are increasing each year. Almost 75 % of these amputations are carried out in neuropathic feet with secondary infection, which are potentially preventable. [2]

According to vascular Society of India (2010) no. of amputations in India are 80,000 to 100,000 every year, which are tip of Iceberg because of poor registry in India.

Neuropathy, Vasculopathy and Immunopathy is the known triad of complications of diabetes mellitus, and are the primary underlying risk factors for the development of foot ulcers and their complication.

Aims and Objectives

1. To study the effect of vac dressing in wound healing.
2. To study the period of wound healing in vac and conventional dressing.
3. To study the cost of vac and conventional wound healing.
4. To study the early cure of infection in vac dressing.

Inclusion criteria

1) All patients with limb wounds.
2) Age >18 yrs.

Exclusion criteria

1) Age < 18yrs.
2) Patient not willing for study.
3) Patients with joint disease and other co morbid conditions like in case of malignancy, peripheral vascular disease .
4) To fissures or fistula.

Materials and Methods

Study Design - Case control study

Study Area – tertiary care hospital of a metropolitan city

Sample Size – 60

Sampling Method – Simple random sampling

Study Period – 24 months

Results

Results controls

	Disappearance of discharge in Days	Reduction in size of ulcer in days	Ulcer size in cm
Mean	25.000	23.267	93.200
Std. Deviation	2.1972	2.0500	23.0073
Minimum	20.0	20.0	64.0
Maximum	28.0	26.0	160.0

The above table consists of average data for control population regarding ulcer size, reduction in size and disappearance in days. The average days taken by discharge to disappear in control were 25 days while 50% reduction in ulcer size was achieved in an average 23.2 days.

Sex distribution

	Frequency	Percent
Female	9	30.0
male	21	70.0
total	30	100.0

Above table shows sex distribution, in the study from the tables are more Males as compare to females.

Number of diabetic in the study

Diabetes	Frequency	Percent
No	14	46.7
Yes	16	53.3
Total	30	100

More than half of the cases were diabetic as evident from the above table.

Results Cases

N=30

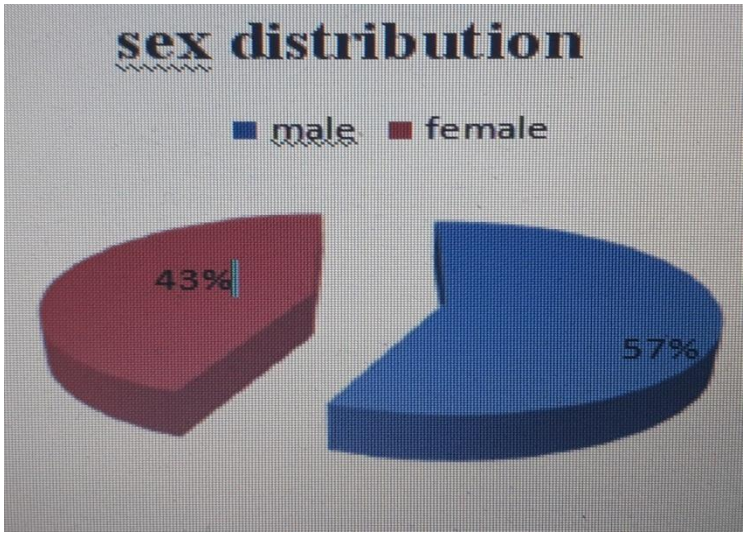
	age	50% reduction in edema in days	Hospital stay	Disappearance of discharge in days
Mean	34.20	13.10	17.20	14.53
Std. Deviation	11.801	1.882	2.007	1.995
Minimum	18	10	14	10
Maximum	65	16	21	18

The above table is a compiled table of various variable observed among cases treated with VAC dressing. The mean age of the cases was 34 years with youngest patient being 18 years and oldest being 65 years. 50% reduction in edema was observed in an average of 17 days and the discharge disappeared in average 14.5 days.

Sex Distribution

sex	Frequency	Percent
Male	17	56.7
female	13	43.3
total	30	100

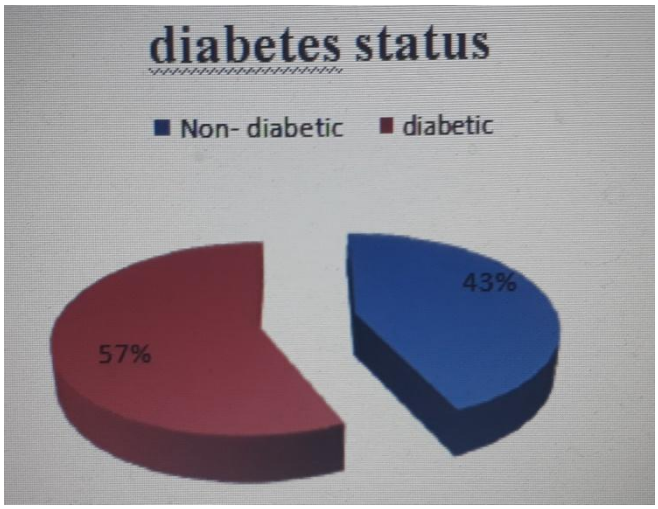
The above table is a sex distribution of cases as it s evident from the table that there are more number of males as cases.



Diabetes Distribution

	Frequency	Percent
Non- diabetic	13	43.3
Diabetic	17	56.7
Total	30	100

From the above table it can be inferred that out of 30 more than half of the patients were diabetic. It is an important variable as the diabetic patients have decelerated healing of the wounds.



	Granulation tissue	50%reduction in edema in days	Hospital stay	Disappearance of discharge in days	Size in cm	Reduction in size of wounds
Mean	14.033	13.100	17.200	14.533	83.567	116.000
Std. Deviation	2.4563	1.8819	2.0069	1.9954	22.0199	20.9433
Minimum	10.0	10.0	14.0	10.0	40.0	80.0
Maximum	18.0	16.0	21.0	18.0	144.0	150.0

The table above is a compiled table of the variables under study for wound healing. it indicates that average days in which granulation tissue appears is 14 in case with VAC dressing, with 50% reduction in edema in an average of 13 days. hospital stay was found out to be only 17 days average. average wound size was 83.5 cm^2.

Comparison between Cases and Controls

Cost of Treatment

	N	Mean(in Rs)	Std. Deviation
Cases	30	12816	1886.8
Controls	30	3100	244.949

Granulation tissue

	N	mean	Std. Deviation
Cases	30	14.033	2.4563
Controls	30	25.667	2.3538

dF = 58, P value = .000

50% reduction in edema

	N	mean	Std. Deviation
Cases	30	13.100	1.8819
Controls	30	23.500	2.1294

dF=58, P value =.0000

Hospital Stay in Days

	N	mean	Std. Deviation
Cases	30	17.3	2.00
Controls	30	30.3	2.55

dF = 58, P value = 0.000

Disappearance of Discharge

	N	mean	Std. Deviation
Cases	30	14.533	1.9954
Controls	30	25.000	2.1972

dF =58, P value= 0.000

Reduction of Ulcer Size in Days

	N	mean	Std. Deviation
Cases	30	11.600	2.0943
Controls	30	23.267	2.0500

dF =58, P value = 0.000

Independent Sample t-test was applied to the means of dependent variables in the study, the P value obtained is written below the tables. It shows there is a significant difference between the means of Hospital stays in days, reduction in discharge, reduction in edema,

All these factors were found to be significantly lower in the cases that were treated with VAC dressing as compared to the conventional dressing except the cost of dressing which is found to be significantly more in the VAC dressing.

Discussion

The study is a case control study trying to assess the utility of VAC dressing over conventional dressing. The study revealed that the hospital stay in VAC dressing patients was less compared to conventional dressing the difference was found to be significant on applying independent sample t-test with P-value <<.0001.

In the study titled comparison of vacuum assisted closure versus conventional dressings in treatment of diabetic by R. Aslam et al[6] a randomized control study was done to compare the outcome of both VAC & Conventional dressing on diabetic ulcer of foot. The ulcer healing was found to be

much faster in patients with VAC dressing and on applying student t-test it was found to be significant just like in our study.

Appearance of granulation tissue in the VAC dressing was found to be earlier than in conventional dressing. The study finding is corroborated by other studies which also had similar finding, a study by Ravari et al[5] titled "Comparision of Vacuum-Asisted Closure and Moist Wound Dressing in the Treat.: EBSCO host" same finding was there with early reduction of wound size. Another study conducted in China[8] found out that VAC promoted capillary blood flow which causes endothelial proliferation causing granulation tissue to grow by increasing microcirculation. This results in early healing of the wound.

Among all the variables VAC demonstrated better result as compared to conventional dressing except cost which was found to be significantly higher in VAC as compared to conventional dressing.

More than half of the study participants in the study were diabetic who have delayed wound healing generally but VAC demonstrated an accelerated wound healing in all those patients. it is in agreement with the other studies which also had faster healing in Diabetic foot ulcer on applying VAC dressing.[2][1][6]

Conclusion

vac dressing is superior to conventional gauze dressing , the only disadvantage of vac dressing is the cost which is significantly higher than conventional gauze dressing.

However due to shorter hospital stay and longer duration between two dressing in vac it is cost effective as wound healing is early.

The future study should try to assess the cost effectiveness of vac dressing as is superiority in other parameters over conventional dressing has already been established.

References

1. Arnold Uveges, T., Gyurdieva, A., Jacobstein, D., Williams, Ml., Danikovc-ovitch, A. Y, Attinger CE, Ducic I, Hess CL, Basil A, Abbruzzesse M, et al. Reliability of free-flap coverage in diabetic foot ulcers. Int Wound J [Internet]. 2010;23(1):107–12. Available from: http://www.apligraf.com/professional/pdf/prescribing_information.pdf%5Cnhttp://www.ncbi.nlm.nih.gov/pubmed/23292584%5Cnhttp://www.ncbi.nlm.nih.gov/pubmed/21951763%5Cnhttp://www.ncbi.nlm.nih.gov/pubmed/22119531%5Cnhttp://www.ncbi.nlm.nih.gov/pubmed/17545775%5Cnhttp:/
2. Ali Z, Anjum A, Khurshid L, Ahad H, Maajid S, Dhar SA. Evaluation of low-cost custom made VAC therapy compared with conventional wound dressings in the treatment of non-healing lower limb ulcers in lower socio-economic group patients of Kashmir valley. J Orthop Surg Res [Internet]. Journal of Orthopaedic Surgery and Research; 2015;10(1):183. Available from: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=4674953&tool=pmce ntrez & render type=abstract
3. Chen S-Z, Li J, Li X-Y, Xu L-S. Effects of vacuum-assisted closure on wound microcirculation: an experimental study. Asian J Surg [Internet]. Asian Surgical Association; 2005;28(November 2004): 211–7. Available from: http://dx.doi.org/10.1016/S1015-9584(09)60346-8
4. Senchenkov A, Petty PM, Knoetgen J, Moran SL, Johnson CH, Clay RP. Outcomes of skin graft reconstructions with the use of Vacuum Assisted Closure (VAC(R)) dressing for irradiated extremity sarcoma defects. World J Surg Oncol [Internet]. 2007;5:138. Available from: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2219960&tool=pmce ntrez&rendertype=abstract
5. Ravari H, MS M, GH K, HG J, AM V, A S. Comparision of Vacuum-Asisted Closure

and Moist Wound Dressing in the Treat...: EBSCOhost. J Cutan Aesthet Surg 2013;617-20 [Internet]. 2013;6(1):17–20. Available from: http://web.a.ebscohost.com/ehost/pdfviewer/pdfviewer?sid=95829768-bc4a-4303-8c27-8cedcaca02e7@sessionmgr4003&vid=0&hid=4204

6. Aslam R, Rehman B, Nasir II, Ahmed R. Comparison Of Vacuum Assisted Closure Versus Conventional Dressings In Treatment Of Diabetic. 2015;8(2):226–30.

Abbreviations

VAC- Vaccum assisted closure
NPWT- Negative pressure wound therapy
DM- Diabetic mellitus
MDFCS- Multidisciplinary foot clinics