Original Research Article

Comparative study in newer techniques for management of diabetic foot

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Abstract

Background: Diabetic foot is the commonest complication of Diabetes Mellitus. It is not totally curable or preventable but with positive approach mortality and morbidity due to diabetic foot can be reduced.

Aim and objectives: To find out which type of treatment modality is better in terms of cost-effectiveness and number of dressings in patients of diabetic foot, to salvage the limb in diabetic patient with help of various modalities of treatment available to our hospitals, to prevent the recurrence of such lesion by careful follow up, by educating the patient about foot care and prescribing pressure distributing footwear, and rehabilitation of patient once the ulcer has healed.

Materials and methods: A total of 60 patients having diabetic foot were included. Clinical assessment was done of all patients after admitting them. History and clinical findings were written as per preformed proforma. All patients were sent to foot wear specialist. All this patients initially underwent debridement or removal of necrotic patch, according to the presenting feature. Depending on the condition of the ulcer (size or slough) they were dressed with newer techniques. Newer techniques used were Vac (Vacuum assisted closure) and Non-Vac (Hydrocolloid, Hydrogel, collagen, Platelet derived growth factor).

Results: Majority of diabetic patients were having neuropathic and traumatic type of lesions. 30 patients were dressed with V ac (Vacuum assisted closure) and remaining 30 patients were dressed with Non-V ac. In which 5 patients were dressed with Hydrocolloid, 3 patients were dressed with Hydrogel, 12 patients were dressed with collagen and 10 patients were dressed with platelet derived growth factor. Comparison between V ac and Non-V ac types of dressing in terms of number of dressings, duration of stay, cost effectiveness is done by applying Z-Test. It was significant.

Conclusion: Newer techniques for dressing- VAC or NON-VAC decreases the morbidity of the patient and also better in terms of cost-effectiveness and duration of stay as compared to conventional dressings.

Key words

Diabetic foot, Vac dressing, Non-vac dressing (Hydrocolloid, Hydrogel, collagen, Platelet derived growth factor).

Introduction

Diabetic foot is the commonest complication of Diabetes Mellitus [1]. Association between Diabetes and symptoms in limb was first recognized by John Rollo (1798) whereas association between diabetic foot ulceration, neuropathy and vascular disease was first recognized by Pryce (1887). It is not totally curable or preventable but with positive approach mortality and morbidity due to diabetic foot can be reduced.

Aim and objectives

- To find out which type of treatment modality is better in terms of cost-effectiveness and number of dressings in patients of diabetic foot.
- To salvage the limb in diabetic patient with help of various modalities of treatment available to our hospitals.
- To prevent the recurrence of such lesion by careful follow up, by educating the patient about foot care and prescribing pressure distributing footwear.
- Rehabilitation of patient once the ulcer has healed.

Materials and methods

A total of 60 patients having diabetic foot were included. Clinical assessment was done of all patients after admitting them. History and clinical findings were written as per preformed proforma. All patients were sent to foot wear specialist.

Following investigations were carried out in those patients of diabetic foot: Routine blood investigations, X-ray local pat, Arterial color Doppler, Swab culture sensitivity.

All this patients initially underwent debridement or removal of necrotic patch, according to the presenting feature. Depending on the condition of the ulcer (size or slough) they were dressed with newer techniques. Newer techniques used were Vac (Vacuum assisted closure) [2] and Non-Vac (Hydrocolloid [3], Hydrogel [4], collagen [5], Platelet derived growth factor [6]). Here, Vac was modified by connecting wound dressing in vacuum with simple suction by means of ryle's tube at pressure of 200 mmHg. Foam used was commercially available as upholster. Small ulcers with minimal/ moderate slough were dressed with Non-V ac large ulcers with excessive slough were dressed with Vac. In this study only material cost is taken into consideration. Patients with arterial disease had failure of dressings so were amputed. Remaining patients were managed with Split thickness graft (STG). These patients were prescribed diabetic insoles and were followed up for 3 months and 6 months to see for recurrence and new lesions.

Results

Type of lesion was as per **Table – 1**. Most common was neuropathic (56.6%) followed by traumatic (46.66%). Treatment of patients with diabetic foot was as per **Table – 2**. Total 30 patients were undergone VAC and rest were Non-VAC.

Discussion

Majority of patients having diabetes were in middle age group and the average is 55.28. Comparing the same with study done by D. Griffith and T. Jeffery, average was 56 years [7].

Majority of diabetic patients were having neuropathic and traumatic type of lesions [8]. Sensory loss commonly found in diabetic patients leading to repeated trauma to foot and finally impaired healing leading to cellulitis. Patients with neuropathic lesions were about 56.66 % which was almost same as that in study done by Minola and Ralphger which was almost same [9]. For Ischemic lesions about 11.66 % of patients were there while in study by Patric Laing, it was 10-15 % which was almost same [10]. Comparison between Vac and Non-Vac types of dressing in terms of number of dressings is done by applying Z-Test. On applying it the value is 17.26 which is greater than 2 suggesting it to be significant. Considering the amount of slough and type of dressing applied, Non-Vac was better for wounds with minimal to moderate slough. But Vac was better for wounds with excessive slough also. Comparing my study with that done by Michel P. Clare and Timothy C. Fitzgibbons success rate in Vac was 82.0% which is comparable [11]. Comparison was done between Vac and Non-Vac in terms of cost-effectiveness by applying Z-Test in which the value of Z was 158.84 which was significant. Difference in cost between Vac and Non-Vac was 30% which can be comparable to the study done by Steve Thomas in which reduction of cost for Vac was 38%. While patients who have not had foot wears, they developed recurrent lesions in 20.0% and newer lesion in 26.66%. It suggests that foot wears to be important in preventing recurrent and newer lesions. In the study done by Cary Groner, recurrence was 18% in patients who used foot wears and it was 58% who didn't used foot wears. So reduction in recurrence by using foot wears was 31.0% which is almost same as that of my study which is 30.0% [12].

Table – 1: Type of lesion.

Type of lesion	No. of patients	Percentage
Neuropathic	34	56.66 %
Traumatic	28	46.66 %
Ischemic	7	11.66 %

Table – 2: Treatment of patients with Diabetic Foot.

Newer Techniques	VAC	NON-VAC			
		Hydrocolloid	Hydrogel	Collagen	PDGF
No. of patients	30	5	3	12	10

Rate of healing of ulcer is faster in Vac (Vacuum assisted closure) as compared to Non-Vac (hydrocolloid, Hydrogel, Collagen, PDGF) [13]. Economically Vac is cost-effective to the patients in our setup. Non-Vac dressing is better for small ulcers with excessive slough. Also Vac is better for those ulcers which fail to improve by Non-Vac dressings [14]. Diabetic shoes in the form of Insoles are important in all patients of diabetic foot to prevent recurrence and formation of new lesions and to maintain the ergonomics of foot. Education of the patient regarding foot care and control of diabetes is important for preventing recurrence.

Conclusion

This study was conducted on small no of patients and so to apply the result on general population, more research is needed. Newer techniques for dressing- VAC or NON-VAC decreases the morbidity of the patient and also better in terms of cost-effectiveness and duration of stay as compared to conventional dressings whereas VAC dressing is more effective than NON-VAC when compared on same objectives.

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