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*RESEARCH ARTICLE*

# EVALUATION OF VARIOUS PROGNOSTIC FACTORS FOR DIABETIC FOOT IN COVID 19 PANDEMIC: A CLINICAL STUDY

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## Abstract

**Background:** Diabetes mellitus is a well-known metabolic disorder of varying severity, especially involving carbohydrate metabolism. It is present in 2-3% of the general population, which may be higher (4-5%) in populations above 40 years of age.

**Aims and Objectives:** (1) To study the clinical presentation of diabetic foot infection, (2) to study the various factors having causal relation with diabetic foot infection, (3) to study various modalities available for treatment of diabetic foot infection, (4) to correlate these factors and management strategies with prognosis of diabetic foot infection.

**Materials and Methods:** A prospective study was carried out in patients of diabetes mellitus Type II presenting with foot infection. This study was carried out in the Department of Surgery in collaboration with Department of Medicine, Maharani LaxmiBai Medical College Jhansi U.P. from January 2020 to June 2021 over the period of 18 months.

**Result:** In our study of 300 Type II diabetes patients who attended medical and surgical Out Patient Departments (OPD) in M.L.B m Medical College Jhansi from January, 1st 2020 to June 30st 2021 over a period of 16 months. A total of 50 patients were found to have a variety of diabetic foot infection.

**Conclusion:** Totally 50 patients of diabetic foot infection were studied in patients from Jhansi and the surrounding areas for a period of 18 months from January, 1st 2020 to June 30st 2021. In our study, the incidence of diabetic foot infection in patients with Type II diabetes was found to be 16.64%.



## Introduction:-

Diabetes mellitus is a well-known metabolic disorder of varying severity especially involving carbohydrate metabolism. Globally, an estimated 463 million adults are living with diabetes; India, with 77 million patients, has the second-highest number of patients after China[1]. Diabetic foot disease represents a real challenge to national health systems and healthcare providers in general[2]. The lifetime risk of a person with diabetes having a foot ulcer has been reported to be as high as 25%, with foot ulcers being the most frequent reason for hospitalization of patients with diabetes (about 30%)[3]. Moreover, treating diabetic foot ulcers is costly, accounting for 20% of total healthcare costs for diabetes, which is more compared to the cost for any other diabetic complication[3]. In India, the numbers of diabetic foot patients are increasing in both urban and rural settings, with 85% of amputations preceded by foot ulcers. Almost 75% of these amputations are performed on neuropathic feet with secondary infection, which



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is potentially preventable. In India, neuropathic lesions account for 80% of foot ulcers, with neuroischemic making up the remaining 20%[4]. It occurs with an almost same frequency in both sexes, and no nation or race is immune to it. Due to mistaken belief and relative simplicity of diabetic foot, to its more glamorous cousins such as nephropathy ad retinopathy, this problem has not been given due respect in scientific publications[5].

The progression of the disease in the foot is a combined effect of peripheral neuropathy, vasculopathy, and hyperglycemia. Due to these factors, minor lesions like cracks; blisters and ingrown toe nails may develop into a serious necrotizing infection with tissue loss. Normal adjustment of the foot in weight bearing do not occur, and heavy calluses form over pressure points, adding to the pressure and causing necrosis under the callus. This chain of events, if not controlled adequately and in time, may lead to precipitate an amputation of the extremity.

If one has to prevent these complications and save the limb, the key is to know them, look for them, diagnose them early and correct them or prevent the progression through early treatment and precautions[6].

## Aims and Objectives:-

1. Strategies to study the clinical presentation of diabetic foot infection
2. To study the various factors having causal relation with diabetic foot infection
3. To study the effect of CVID 19 pandemic on diabetic foot disease.
4. To study various modalities available for treatment of diabetic foot infection
5. To correlate these factors and management with prognosis of diabetic foot infection.

## Material And Methods:-

A prospective study was carried out in patients of diabetes mellitus Type II presenting with foot infection. This study was carried out in the Department of Surgery in collaboration with Department of Medicine,Maharani Laxmi Bai Medical College Jhansi U.P. from January 2020 to June 2021 over the period of 18 months.

A wide variety of presentation of diabetic foot was in the study. The patients were further studied in detail and the information regarding their history, presentation and complications were recorded on a predesigned proforma.

A detailed history regarding duration of diabetes, treatment, family history, addiction to alcohol, tobacco, precipitating factors such as trauma, massage, shoe bite, pain in lower limbs, fever and associated comorbidities was taken. Information about foot wear use was elicited. Relevant positive findings in systemic examination were recorded. A detailed foot examination was carried out with respect to the presence of ulcer or ulcers, cellulitis, callus, gangrene, previous operative scars, foot deformities, etc.

Assessment of vasculopathy was done based on ankle brachial index (ABI), palpation of the femoral artery, popliteal artery, dorsal pedis artery was done in both lower limbs. If the arteries were palpable at ankle level, we measured ABI for both lower limbs.

**Table 1:-** ABI:Ankle brachialindex.

| | |
|---|---|
| Normal | 0.9-1.1 |
| Mild | 0.7-0.8 |
| Moderate | 0.5-0.6 |
| Severe | 0.3-0.4 |
| Atherosclerosis | ≥1.2 |

Neuropathy was assessed by biothesiometry and monofilament test in our study. Vibration sense which are carried by long nerve fibers was quantified using biothesiometry. In our study, we tested vibration sense on bony points like medial malleolus and tip of great toe for both feet.

A biothesiolometer works on the principle of application of electric energy to a calibrated vibrator. This voltage can be increased from 0 to 60 V by turning the control switch to the right in a clockwise manner gradually. The procedure is done separately for medial malleolus and great toe. The patient labeled as having mild, moderate or severe neuropathy based on the value of vibration perception threshold (VPT) which are as under.

**Table 2:-** VPT (Vibrationperceptionthreshold).

| Neuropathy | VPT (Vibrationperceptionthreshold) |
|---|---|
| Normal | <15 |
| Mild | 15-19 |
| Moderate | 20-24 |
| Severe | >24 |

Biochemical evaluation included an examination of blood sugar, blood urea, creatinine, micro albumin in the urine. A complete blood count and hemoglobin, erythrocyte sedimentation rate, packed cell volume, was done. Patients in which range of random sugar was above 200 mg% were considered as uncontrolled diabetics, whereas those which sugar level in the range of 140-200 mg% were considered as well controlled diabetics in our study.

Pus culture was advised in all cases. A probe test was done to find out the depth of the ulcer. It was considered positive if the probe touched the bone at base of the ulcer. In the case of positive probe test for osteomyelitis, X-ray foot was advised.

All the patients were kept on insulin for the management of diabetes. Broad spectrum antibiotics were started upon admission and later switched on to culture specific antibiotics.

A routine radical debridement was carried out in all cases. Some patients required minor or major amputation along with debridement. Few patients needed repeated debridement. Modified foot therapy was also given in patients with the use of weight relief shoes, total contactcast, slab, etc. A record was kept on the outcome of the patient regarding wound healing, number of days of healing was recorded, discharge left against medical advice absconded or death.

## Observations:-

In our study of 300 Type II diabetes patients who attended medical and surgical OPD in Maharani Laxmi Bai Medical College Jhansi U.P. from January 2020 to June 2021 over the period of 18 months. 50 patients were found to have a variety of diabetic foot infection

**Table 3:-** On General Examination.

| Anaemia | Number of patients | Percentage |
|---|---|---|
| Pallor present | 36 | 72 |
| Pallor absent | 14 | 28 |

**Table 4:-** Location of Ulcer.

| Characteristics | Number of patients | Percentage |
|---|---|---|
| Dorsum | 11 | 22.0 |
| Toes | 17 | 34.0 |
| Planter metatarsal head/mid foot/heel | 15 | 30.0 |
| Involvement of lower limb above ankle | 7 | 14.0 |

**Table 5:-** Foot Deformities: Incidence of Foot Deformities.

| Type of deformity | Number of patients | Percentage |
|---|---|---|
| Collapse of foot arch | 12 | 24 |
| Bony prominence | 8 | 16 |
| Hallux valgus/varus | 5 | 10 |
| Nail hypertrophy | 22 | 44 |
| Infection of toe nail | 25 | 50 |

**Table 6:-** Vasculopathy.

| Ankle brachial index | Number of patients | Percentage |
|---|---|---|
| >1.1 | 5 | 10 |

| | | |
|---|---|---|
| 1.1-0.9 | 10 | 20 |
| 0.8-0.5 | 14 | 28 |
| 0.4-0.3 | 8 | 16 |
| <0.3 | 13 | 26 |

**Table 7:-** Neuropathy by Biothesiometry.

| **Number of patients** | | **Percentage** |
|---|---|---|
| Normal (<15 V) | 10 | 20 |
| Mild (15-19 V) | 7 | 14 |
| Moderate (20-24 V) | 13 | 26 |
| Severe (>25 V) | 20 | 40 |

**Table 8:-** Neuropathy byMonofilament.

| **Monofilament testing** | **Number of patients** | **Percentage** |
|---|---|---|
| ≥3/5 reception | 10 | 20 |
| <3/5 reception | 40 | 80 |

**Table 9:-** Test for Nephropathy/Retinopathy.

| **Test** | **Number of patients** | **Percentage** |
|---|---|---|
| Nephropathy (microalbuminuria)>30µg% | 19 | 38 |
| Retinopathy NPDR | 10 | 20 |
| Retinopathy PDR | 5 | 10 |
| Both | 9 | 18 |

**Table 10:-** Pus Culture.

| **Culture bacteria** | **Number of patients** | **Percentage** |
|---|---|---|
| S. aureus | 14 | 31.11 |
| E. coli | 12 | 26.6 |
| Streptococcus | 11 | 24.2 |
| Klebsiella | 4 | 8.88 |
| Pseudomonas | 4 | 8.88 |

**Table 11:-** Complications.

| **Complications** | **Number of patients** | **Percentage** |
|---|---|---|
| Osteomyelitis | 18 | 36.0 |
| Gangrene | 21 | 42.0 |

**Table 12:-** Treatment.

| **Treatment** | **Number of patients** | **Percentage** |
|---|---|---|
| Debridement with dressing | 40 | 80 |
| Debridement with minor amputation | 7 | 14 |
| Debridement with major amputation | 3 | 6 |
| Repeat debridements | 11 | 22 |

**Table 13:-** Pressure Offloading.

| **Pressure Offloading** | **Number of patients** | **Percentage** |
|---|---|---|
| Offloading followed | 28 | 56 |
| Offloading not followed | 22 | 44 |

**Table 14:-** Medical Therapy to Enhance Circulation.

| **Medical Therapy** | **Number of patients** | **Percentage** |
|---|---|---|
| Antibiotics | 30 | 60 |
| Antibiotics other drugs | 44 | 88 |

**Table 15:-** Duration of Healing, Discharge, Mortality.

| Mode of discharge | Number of patients | Percentage |
|---|---|---|
| Regular follow-up | 38 | 76 |
| Left against medical advice | 8 | 16 |
| Mortality | 1 | 2 |
| Absconded | 3 | 6 |

## Discussion:-

The prevalence of Type II diabetes in India is between 1% and 5% and it is estimated that there are 30 million Type II diabetic patients or 60 million potential diabetic feet in our country. Due to regional factors the clinical spectrum of diabetic foot problems showed variation.

The hallmark of diabetic foot problem in India is gross infection due to late presentation walking bare foot, walking even on ulcerated foot, late diagnosis of diabetes, uncontrolled diabetes and trust in faith healers due to illiteracy using Hawaichappals or slippers induced ulcer are seen between first and second toe due to presence of thong between the toes. The use of these slippers by naturopathic patients may cause further aggravation of clawing of toes and toe tip ulcer.

The vast majority of diabetic foot complications leading eventually to amputation begin with the formation of skin ulcer.

**Diabetic Foot Disease during the COVID-19 Pandemic**

The global pandemic has presented many challenges in the management of people with diabetes particularly with late complications such as risk factors for foot ulceration.New modes of patient consultation have widely been used during the pandemic including the use of telephone consultations and telemedicine sometimes with video consultation.Thus, the outpatient management of people with diabetes and its complications has faced a huge challenge during the last twelve months and in many countries, the classical "face-to-face" clinics have been cancelled and replaced by telephone consultations as noted above[7]. This development has therefore posed a threat to those with diabetic foot problems including active DFUs, ischaemia, and Charcot neuroarthropathy. The proper and careful clinical examination and assessment of risk of diabetic foot disease still requires a full physical examination of the lower limbs[8]. Realising the risk to people with neuropathy and vascular disease, the American Podiatric Medical Association put out aspecial communication in 2020 emphasising the importance of appropriate management of DFUs and other complications during these difficult times[9]. As can be seen, during the strictest of lockdowns in many countries, most routine investigations which are normally required for the assessment of the diabetic foot, even including a plain X-ray, were not possible. Other threats to those with neuropathy and peripheral arterial disease are listed below.

1. Suspension of all routine lab tests, e.g., CRP, FBC, U&Es
2. Suspension of all routine investigations, e.g., X-rays, MRI, and other imaging tests
3. Suspension of routine non-invasive vascular laboratory tests
4. Suspension of all non-emergency surgery including bypass (PAD and CAD) and minor amputations

DFU=Diabetic foot ulcer, CRP = c-reactive protein. FPC = full blood count. U&Es = urea and electrolytes. MRI = magnetic resonance imaging. PAD = peripheral arterial disease. CAD = coronary artery disease.

A further problem amongst people with diabetes has been an understandable and real element of fear. Widespread publicity of the COVID-19 pandemic has alerted those with diabetes to realise that should they be admitted to the hospital, the risk of a poor outcome is higher than in those without diabetes. Thus, many people with diabetes have been truly frightened to attend hospital clinics as they quite rightly perceive that the hospital is likely to be occupied by many patients with active COVID-19 disease. This perceived and in many ways realistic fear has led to a reduced attendance rate that has been observed in many hospital outpatient clinics.

**On General Examination**

Pallor was found in 65% of cases, and it was seen that these patients took greater time for the ulcer to heal**[Table-3].** Mission et al. found in their study that the anemia was due to decrease in erythropoietin formation form kidney, which are usually hypofunctioning diabetic cases specially patients with microalbumiuria.

**Location of Ulcer**
In majority of patients ulcer were located on toes 34% (17 out of 50 patients), followed by the plantar surface, including metatarsal head, mid foot and heel comprising 30% (15 out of 50 patients)**[Table 4]**.

Patients having involvement of dorsum or toes only, shows better response to treatments whereas patients with involvement planter surface have shown poor response.

Apelquent et al., in their study of 314 diabetic foot lesions showed that most common ulcer sites were that toes i.e., 51%, planter metatarsal heads, mid foot and heal formed 28%, dorsum of foot 14% and multiple ulcer 7%. The results of their study were fairly consistent with the results of this study[5-6].

Reiber et al. conducted a study of 302 diabetic foot lesions, which showed that 52% of ulcers involved the toes, 37% involved the metatarsal heads, mid foot or heel and 11% involved dorsum of foot[10-11].

In our study, similar results were found with ulcer involving metatarsal heads, mid foot or heel showing poor results.

**Foot Deformities**
Foot deformity was present in 25 patients i.e. 50%. out of 12 patients, who had collapsed foot arch 8 had shown (66.6%) progression of the disease, to form bony prominence but in this study presence of deformity has not been taken as independent risk factor**[Table 5]**.

In our study, foot lesions took significantly longer time to heal, especially in patients with abnormal bony prominence. Bose et al. in his 240 case of plantar abscess found that 70% of began as lesion near nail or nail bed, while 140 began as web infection and 30 were caused by direct penetration of sole.

**Vasculopathy**
Pendsey has reported 23.21% patients who underwentamputations had vasculopathy causing ischaemia[12].

It is generally believed that 75-90% of patients with foot lesions will have neuropathy in India and 10-15% will have vasculopathy. There would be some who have neuroischaemic foot as well.

In our study, 26% of patients had ABI <0.3 and 15 out of 21 cases of gangrene the ABI was found in the range of 0.8-1.1**[Table 6]**. This suggests that peripheral arterial disease is found in very few cases. Infection digital thrombosis appears to be a more common cause of gangrene.

**Neuropathy by Biothesiometry/Monofilament**
Selby et al. reported that a VPT >25 V causes more chances of formation of foot ulcer when compared to VPT of <15 V.6

In study of 1010 consecutive patients of Type II diabetes a high prevalence of neuropathy was noted by considering the surrogate markers of neuropathy like dry skin (77%) (signifyingsudomotor dysfunction as an indicator of autonomic neuropathy), heel fissures (59%), and callus (13%).

Levin reports that the prevalence of neuropathy can be as high as 50% with diabetes of more than 25 years duration[13].

In our study, 80% of patients (40 out of 50 were diagnosed to have neuropathy) **[Table 7,8]** emphasizing the fact that the diabetic foot infection is developed against the background of neuropathy. These neuropathic foot are more vulnerable to trauma, which results in the breakdown of skin barrier to infection.

In recent study by Armstrong et al which attempted to identify on practical neurological screening test reported that a positive Semms-Weinstein test in which patient lacks perception at 2 out of 5 point on each foot. This test was 97% sensitive and 83% specific for positively identifying loss of protective sensation[14].

**Test for Nephropathy/Retinopathy**

In patients of retinopathy due to reduced vision the patient cannot take proper care of their wound resulting in delayed in healing, they are more liable to foot injuries. In our study retinopaty was noted in total 24 patients out of 50 patients of diabetic foot (48%)**[Table 9]**.

In patients of nephropathy, there is associated anemia and pedal edema resulting in a delay in healing. In our study micoalbuminuria was present in 38% (19 out of 50 patients)**[Table 9]**.

In 1990 Gupta and Veith, noted microalbuminuria to be present in 26.6% of Type II patients studied by him in North India. Mohan et al., of South India observed prevalence rate of 36.5% for macroalbuminea among Type II patients. Patients with renal failure are at higher risk for amputation[15].

**Pus Discharge and Culture**

In our study, 90% of ulcer had discharge in the form of serous, serosanguinous, purulent, seropurulent nature etc. (45 out of 50 patients). Of 45 patients 12 (26.6%) have culture positive for Escherichia coli, 11 for Streptococcus (24.4%), 14 for Staphylococcus (31.1%), 4 for Klebsiella (8.88%), 4 patients had pseudomonas infection. In no case pus culture was sterile**[Table 10]**. Patric Laing in his article titled the development and complications of diabetic foot ulcer's have drawn the conclusion that most common aerobe isolated from diabetic foot ulcer was Staphylococcus aureus followed by Streptococci and E. coli.

**Complications**

In our study, 18 out of 50 patients (36.0%) were found to have bony involvement, and 21 patients (42.0%) were found to have gangrene**[Table 11]**.

Jason Culhoun received more than 2000 diabetic foot infections and related disorders requiring hospitalization at his institution. Of this 28% had osteomyelitis and 18% had gangrene.Coulhoun treated 128 patients with 60 having complication either in the form of osteomyelitis or gangrene, rest were without these complications[16].

48 out of 60 patients (80%) have shown progression of the disease. In our study, patients with complications have taken more time and other measures for complete healing of ulcers.

Both studies suggest a poor prognosis of patients with complications such as osteomyelitis and gangrene.

In our study, 40 patients, i.e., 80% were benefited from debridement with dressing while 10 patients i.e., 20% required debridement and amputation**[Table 12]**.

We used normal saline and oxyferrin, oxum and other collageninase and other local antibiotics ointment for dressing after debridement. In our study, 11 cases required redebridement of the wound.

In our study, aggressive debridement followed by closed dressing with normal saline and oxyferrin was much more effective in comparison to routine debridement followed by hydrogen peroxide and chlorine water dressing.

In the study conducted by Apelquistet al[5]., 63% of the diabetic foot ulcers healed by re-epithelialization/primary healing. Similar studies by Reiber et al[11]. showed that 81% of diabetic foot ulcers healed by re-epithelialization of primary healing. However, the finding of the present study with 58% of re-epithelialization of ulcers is similar to the findings of the study by Apelquist et al[5] in which 63% of ulcers healed similarly.

In study by Reiber et al[10], foot infection is often the proximate cause leading to tragic outcome of amputation in 25-50% of diabetic foot infections and lead to a minor (i.e. foot sparing amputation) while 10-40% require major amputation. Wegner et al[18]., found that moist wound environment provides the best environment for wound regeneration and repair.

**Pressure Offloading**

We used foam in 28 out of 50 patients (56%) and the ulcer healed at faster rate compared to other patients with a foot ulcer**[Table 13]**. Offloading offers focal pressure relief by decreasing pressure. This prevents damage to new capillaries of granulation tissue.

**Modified Boot Therapy**

A study at King's College in London showed that 83% recurrence of ulcer was seen when patient returned to wearing regular shoes, only 17% recurrence of ulcer was with special therapeutic shoes. Similarly a study by Ulbrecht et al., reported that therapeutic shoes special designed for individuals with diabetes were effective in preventing relapse in patients with recurrent ulceration[17].

Negative heel shoes for focal pressure relief rockers were further added. Total contact cast was given in purely neuropathic ulcer for redistribution of pressure.

"BOOT" is a mechanical device which causes rhythmic compression and release and enhance circulation of the foot and improve healing when enclosed around lower leg and foot.

**Medical Therapy to Enhance Circulation**

Addition of drug to increase the rheological property of blood, lipid lowering drugs, antiplatelet drugs, anti-thrombotic drugs improve the outcome of foot infection.

In 44 out of 50 patients we used drugs**[Table 14]**, which increase the rheological property (fluidity) of the blood, i.e., cilastazole and pentoxiphylline, drugs which decrease the platelet aggregation, reduces hyper permeability and stabilizes endothelial membrane of vessels i.e., clopidogrel, ecoaspirin and calcium dobesilate along with antibiotics. It was found in these patients healing in fast in comparison to those using antibiotics alone.

In 30 out of 50 patients, we used higher antibiotics alone. broad spectrum (amoxycillin with clavailanic acid or fourth generation cephalosporin along with metronidazole)**[Table 14]**.

**Duration of Healing, Discharge, Mortality**

The mean duration of healing in our study in the female population was 69.33 days, whereas for a male population it was 60.44 days**[Table 15]**.

In our study, mortality was 2.0%. Only one patient died due to septicemia and chronic renal failure. In our study, seven patients left against medical advice and three were absconded during the treatment**[Table 15]**.

Wagner et al.; in his study concluded that considerable international differences were found not only in the mortality rate following amputations, but they also vary according to the type of diabetes. In his opinion, non- insulin-dependent diabetes mellitus patients had an excess mortality in comparison to the general population. However, the results obtained in this study does not match with the opinion of Wagner et al. This may be attributed to the geographical differences, differences in post-operative care set up and small sample size[18].

## Conclusion:-

1. Fifty patients of diabetic foot infection were studied as in patients from Jhansi and the surrounding areas for a period of 18 months from January 1st, 2020 to June 2021. In our study, the incidence of diabetic foot infection in patients with Type II diabetes was found to be 16.64%.
2. COVID 19 pandemic itself posses a threat for diabetic patients and is a bad prognostic factor for diabetic foot patients by causing delay in the diagnosis and treatment of DFU, the current pandemic of COVID-19 raises the possibility of the world experiencing a tsunami of late complications of diabetes in subsequent years when the pandemic is over.
3. Foot deformities were present in 50% of patients. In our study foot lesions took significantly longer time to heal, especially in patients with bony prominences.
4. Neuropathy was the most common factor resulting in the development of diabetic foot ulcers (80%) and was associated with poor response to treatment.
5. Peripheral vascular disease (PVD) was associated with 18% of diabetic foot lesion, and these patients had the worst response to treatment. Pallor was present in 72% of cases in our study vasculopathy was present in 70% of cases with 26% having ankle branchial index having <0.3. Neuropathy by biothesiometry and monofilament test was done, and 40% had severe impairment. With increase duration of diabetes mellitus microvascular complications like neuropathy, nephropathy (38%), retinopathy (48%) set in. In associated comorbid conditions, for example, myocardial infarction, hypertension, ischemic heart disease, pulmonary tuberculosis, etc. morbidity was higher.

6. The most common location of diabetic foot ulcer was over the toes (34%), followed by plantar aspects of foot (including metatarsal head, mid foot, and heel) in 30%. Dorsum was involved in 22.0% of cases. Patients having involvement of dorsum or toes had shorter duration healing, whereas patients with involvement of the plantar surface had shown prolonged duration of healing.
7. In our study, predominant organism infecting the ulcer was S. aureus (31.1%).
8. Incidence of osteomyelitis in our study was 36.0% in diabetic foot ulcer while gangrene was reported in 42% of cases. I
9. In our study, 80% of patients in our study were benefited from debridement and dressing and among them aggressive debridement, and dressing with normal saline, oxyferrin and oxum was more effective. In our study, 22.0% of patients i.e. 11 out of 50 required redebridement of the wound, 3 out of 40 patients required major amputation and 7 out of 40 required minor amputation.
10. Pressure offloading with foam was effective in the treatment of diabetic foot. In our study 28 out of 50 patients (56%) who followed offloading with foam, their ulcer healed at faster rate compared to other patients with a foot ulcer.
11. Modified therapeutic BOOT therapy led to better and early healing as compared to the cases where it was not feasible.
12. When higher broad spectrum antibiotics e.g. amoxicillin with clavulanic acid or fourth generation cephalosporin along with metronidazole were used along with the other drugs which increases rheological property of blood healing occurred earlier than using antibiotic alone.
13. To conclude presence of comorbidities, such as neuropathy or PVD, vasculopathy, nephropathy, retinopathy. Pus discharge, involvement of plantar surface, presence of osteomyelitis or gangrene, all had bad prognostic implications, whereas use of pressure offloading measures or modified therapeutic “BOOT” therapy, aggressive debridement and closed dressing with saline and oxyferrin/ oxum, use of medicines to enhance circulation and use of antibiotic all favoured better and faster healing of diabetic foot lesions.

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