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Review Article

DIABETIC FOOT CARE IN FAMILY PRACTICE

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Abstract:

One of the major leading cause of mortality is Diabetes Mellitus (DM) foot complication is many developed and developing countries. Diabetes Mellitus is a complex disease, and foot ulceration is one of the most common complications. Due to poor foot care knowledge and practices, it poses important risk factors for foot problems among people with diabetes.

The aim of Work: The study aimed to assess the knowledge and practices regarding foot care and management on a daily basis in patients with diabetes mellitus

Methodology: We conducted this review using a comprehensive search of MEDLINE, PubMed, and EMBASE, January 1985, through February 2017. The following search terms were used: knowledge and practice, diabetic foot care, foot care measures, diabetic foot ulcer

Conclusion: Good knowledge and practice regarding foot care will reduce the risk of diabetic foot complications and ultimately amputation. There is no significant association between patient's demography with direct knowledge and practice of foot care. Educational programs focusing on awareness of diabetic foot care must directly involve the community, and thereupon to lessen the incidence of diabetic foot complications. It should be done in primary care up to tertiary care centers as a multidisciplinary effort.

Keywords: *Knowledge and practice, diabetic foot care, foot care measures.*

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EPIDEMIOLOGY AND PREVALENCE:

Diabetes mellitus (DM) is common, potentially disabling metabolic disorder characterized by chronic hyperglycemia. Currently, 194 million people worldwide are afflicted from DM, and it is estimated to reach 333 million people in 2025 as a consequence of a sedentary lifestyle, changing dietary patterns and longer life expectancy. About 60% of the poorest countries in the world are in sub-Saharan Africa, and the greatest rise in the prevalence of diabetes can be seen in this region in the next 20 years. Hence the rise in the prevalence of DM is likely to increase its complication among diabetic patients. [1-4] One of common complication is a diabetic foot, often quite dreaded disability, with long stretches of hospitalization and with the result of an amputated limb. The prevalence of diabetic foot ulcer (DFU) ranged between 1.0% and 4.1% in the United States (US), 4.6% in Kenya, and 20.4% in the Netherlands.[5,6] About 15% of diabetic individual suffers during their lifetime. It is now appreciated that 15 – 20% of patients with such foot ulcers go on to need an amputation. Diabetic foot ulcers precede almost 85% of the amputations. [7]

METHODOLOGY:**• Data Sources and Search terms**

We conducted this review using a comprehensive search of MEDLINE, PubMed, and EMBASE, January 1985, through February 2017. The following search terms were used: diabetic foot ulcer, knowledge and practice, diabetic foot care, foot care measures.

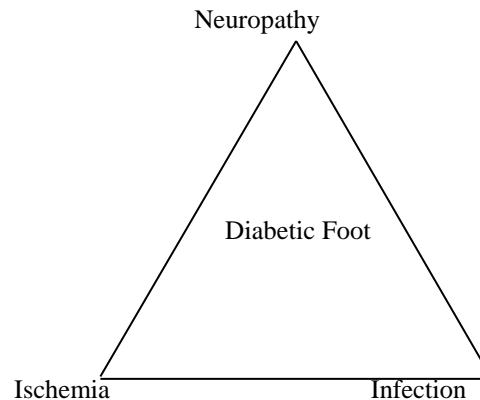
• Data Extraction

Two reviewers have independently reviewed the studies, abstracted data, and disagreements were resolved by consensus. Studies were evaluated for quality and a review protocol was followed throughout.

The study was approved by the ethical board of King Abdulaziz University Hospital

RISK FACTORS OF DFU:

Neuropathy, ischemia, and infection from the classical triad of the diabetic foot.



Identifying the risk factors is the key to manage and control DFU. There are multiple risk factors associated with DFU: [8-10]

- Gender (Male>Female)
- Duration (>10 years)
- The advanced age of patients 18-21
- Body Mass Index
- Retinopathy
- Diabetic peripheral neuropathy
- Peripheral vascular disease
- Glycated Hemoglobin level (HbA_{1C})
- Foot deformity
- High plantar pressure
- Inappropriate foot care habits and infections

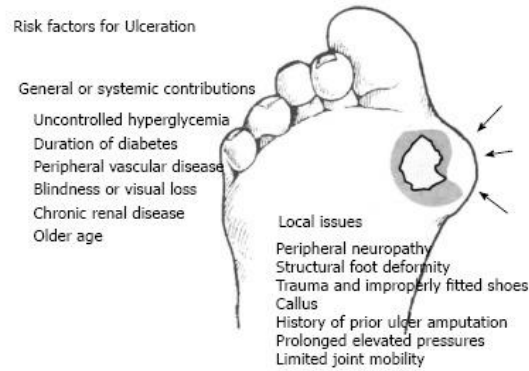


Figure 1: General or Systemic and Local risk factors [11]

Although there is some risk factors related to diabetes that contribute to lower extremity ulceration and amputation, but most has been caused by ischemic, neuropathic or combined neuroischemic abnormalities. [11]

Mechanism of Diabetic Foot Ulcer

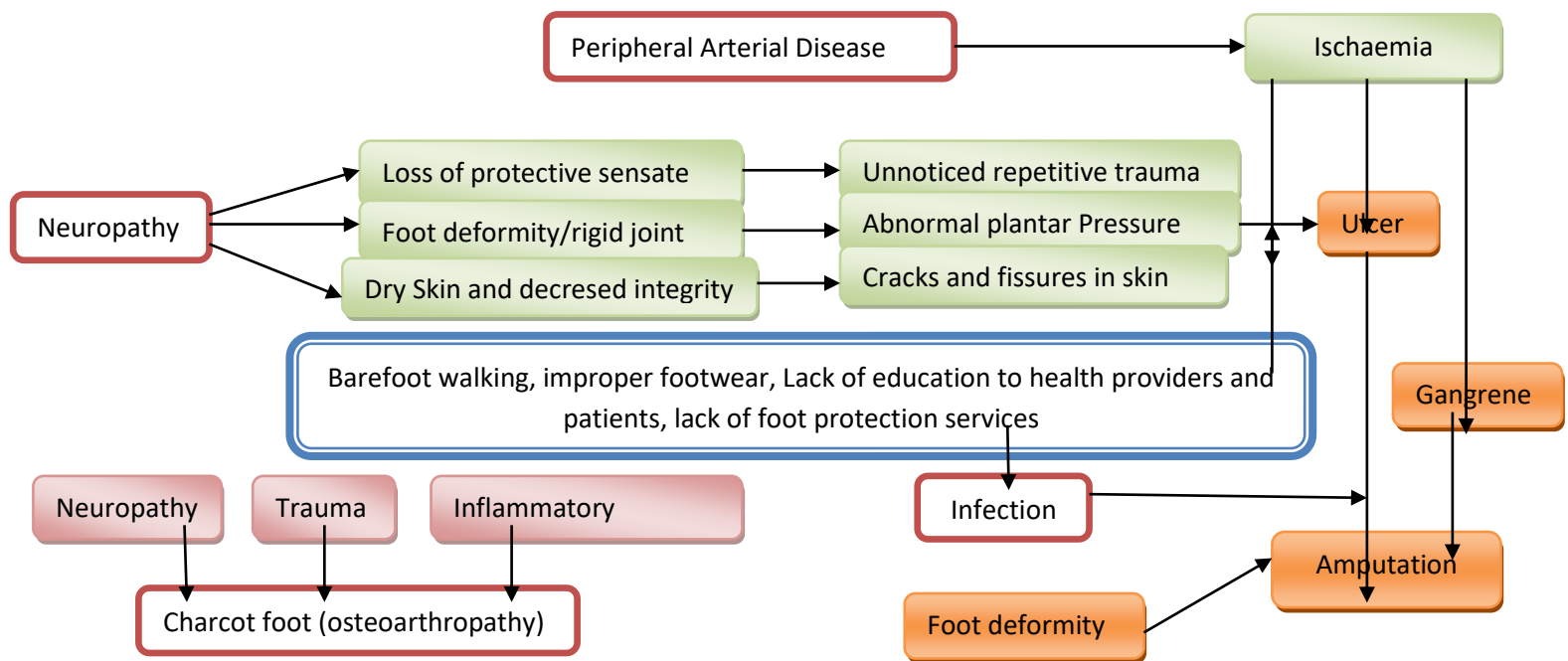


Figure 2: Mechanism and other risk factors of Diabetic Foot Ulcer [11]

ASSESSMENT OF DFU:

A thorough foot examination at an early stage of disease and screening for peripheral neuropathy and peripheral arterial disease can help identify patients at risk of foot ulcer. Patient assessment for poor glycemic control, history of ulcers and amputation, a

general condition for signs of toxicity and sepsis, abnormal behavior, circulation and respiration with or without fever are important factors to consider.

A follow-up visits for feet examination for active diseases such as ulceration or gangrene. Lesions such as fungal infection, cracks, skin fissures, deformed

nails, macerated web spaces, calluses, deformities such as hammer toes, claw toes, and pes cavus might increase the risk of ulceration. Cold foot might

suggest ischemia, and increased warmth with redness might be suggestive of inflammation such as Charcot foot or cellulitis. [12]

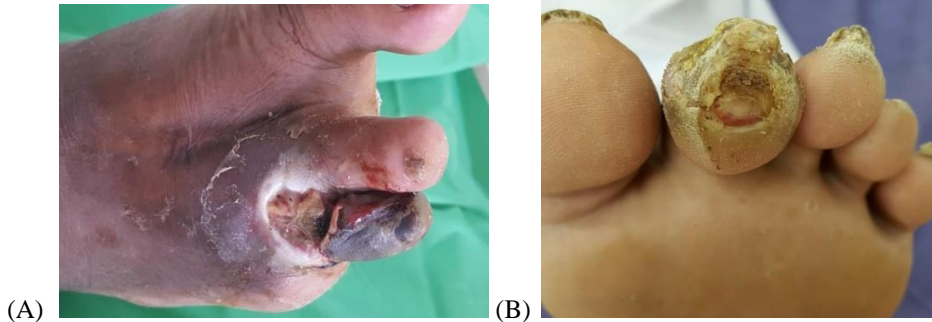


Figure3: (A) Gangrene and ulcer in the foot at high risk of amputation (B) Hammer toe deformity with callus and ulcer. [12]

Peripheral neuropathy, loss of protective sensation in the feet can be assessed using monofilament test uses a monofilament which exerts 10g buckling force on 9 plantar sites, the distal great toe; third toe; fifth toe; first, third, and fifth metatarsal heads; medial foot, lateral foot, and heel; and one dorsal site. Failure to sense a 10 g monofilament three times even at a single site Inability to sense a 10 g monofilament three times at even a single site can mean the patient has damage of protective sensation. [13,14]



Figure 4: assessment of loss protective sensation in feet using monofilament test at 9 different sites of feet. [12]

The history of intermittent claudication can evaluate peripheral arterial disease and rest pain, a record of pulsation as absent or present by palpating posterior tibial artery and dorsal pedal artery. The brachial-ankle index can be used as an adjunct. It is the systolic pressure at the ankle, divided by the systolic pressure at the arm and is measured using a Doppler device, on grading the severity of obstruction. [15,16]

Severity is interpreted as shown in table 1 [17]

- | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • 0.91-1.3—Normal • 0.70-0.90— Mild Obstruction • 0.40-0.69—Moderate Obstruction • <0.40—Severe Obstruction • >1.3—Poorly Compressible Vessels |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Table 1: brachial ankle index severity

PREVENTION OF DFU:**Regular Foot Examination:**

The frequency of the following is based on consensus. For people at low risk should continue annual foot assessment as they can progress to moderate or high risk. Emphasis should be given on foot care measures and glycemic control. A more frequent follow-up is required in patients at moderate to high risks such as those with a foot deformity and peripheral neuropathy or peripheral arterial diseases. A quick inspection for a breach in skin integrity or ulceration should suffice. [16] Patient referral to preventive podiatry services is important in case of calluses, deformed toenails for basic nail and skin care which includes calluses debridement. Hence a timely referral of patients with risk factors associated with foot ulceration can prevent infection, gangrene, amputation, death and decreases hospital admission and reduces the cost of treatment. [18]

Glycemic Control:

Early glycemic control is effective in preventing neuropathy. A standard guideline is followed to keep blood sugar and glycated hemoglobin (HbA_{1c}) at an optimal level. Both should be a monitor as per the standard guidelines to slow down and prevent the progression of peripheral neuropathy. [19]

Patients Education:

It is important to offer diabetic people an oral or written information on:

- Importance of blood glucose control and modifiable cardiovascular factors such as diet, exercise, body weight and cessation of smoking.
- The importance of foot care and advice on basic foot care, while offering advice patients' cultural and religious practices, social and family support is to be considered
- Person's current risk of developing a foot problem is discussed
- When to seek professional help and who to contact in foot emergencies.

Tips on Foot Care for People with Diabetes: [15]

- Inspection of both feet daily, including between toes.

- Wash feet daily with water at room temperature , with careful drying between toes.
- Use lubricating oils or creams for dry skin , but not between toes
- Cut nail straight across
- Do not remove corns or calluses using chemical agent or plaster. They should not be excised at home and must be managed by trained staff
- Always wear socks with shoes and check inside shoes for foreign objects before wearing
- Avoid barefoot walking at all the times
- Ensure a qualified healthcare provider to examine feet regularly
- Notify the healthcare provider at once if the blister, cut, scratch or sore develops

One of the major reasons for foot ulceration is effective patient education on foot care is lacking. A Cochrane review of 11 randomized trials concluded that foot care education alone does a positively influence patient knowledge and behavior in the short term but is ineffective in preventing diabetic foot ulcers. Although there is limited evidence by the International working group on Diabetic Foot that acknowledges the long-term efficacy of patient education and DFU prevention, some form of patient education is recommended to improve their foot care knowledge and behavior. [20]

Footwear:

Regular occlusive footwear causes sweating and is predispose to fungal infection, particularly in tropical countries. [21,22] The ideal footwear for the diabetic patient should have a wide toe box, soft cushioned soles, extra depth to accommodate orthoses and requires and laces or Velcro for fitting adjustments. Patients fail to use footwears at home where they are more active, and they do not comply with prescribed footwear. Offloading footwear is recommended to patients with plantar ulcers at forefoot or heel for better ulcer healing and prevent its recurrence, since offloading footwear reduces pressure on the specific part of the foot. This also prevents the formation of new ulcers. [23]

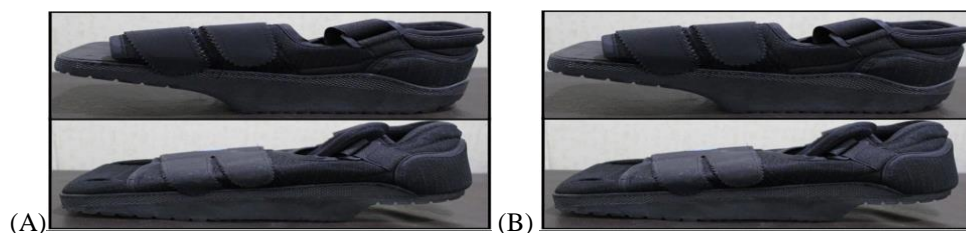


Figure 5: (A) footwear that reduced pressure on the forefoot (B) allows a pressure on the heel to be offloaded. [12]

CONCLUSION:

To minimize the complications of DM, emphasis should be put on the importance of the active role of diabetics in their general self-care, particularly in foot care. Foot ulcers in patients with diabetes are common and frequently leads to lower limb amputation unless a prompt, rational, multidisciplinary approach to therapy is taken. The main components of management that can ensure successful and rapid healing of DFU. Education in a structured, organized, and repetitive manner, combined with preventive interventions may succeed in preventing foot problems in diabetic patients.

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