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Prevention of Diabetic Foot Complications and Foot-Care Practices Among Patients with Diabetes

Mr. Manish Sharma

Community Health Officer ,Government Of Rajasthan

Abstract

The diabetic foot disease is a potentially dangerous and possibly preventable complication of diabetes mellitus which may result in ulceration, infection, hospitalization, diminished quality of life and amputation of lower limbs. Some of the significant factors leading to development of peripheral neuropathy include peripheral arterial disease, peripheral neuropathy, foot deformities, prior ulceration, inappropriate footwear and poor self care. Prevention then involves conducting early risk screenings of people, regular foot examination, effective glycaemic risk and cardiovascular risk management, education of patients, daily foot checking, proper footwear, and professional intervention in time. Recent guidelines focus more on risk-based screening and combined foot care especially in patients with neuropathy, peripheral artery disease, a history of ulcer, and or an amputation. Assessment of risk, educating and reinforcing self-care practices, and early referral were significantly the functions of nurses and other healthcare professionals. New strategies can be used to support those high-risk patients by using new methods such as home foot-temperature monitoring and other digital health technologies. Altogether, the prevention of diabetic foot necessitates the ongoing cooperation between the patients, their families, and the multidisciplinary healthcare teams. Avoidable complications can also be minimized through regular preventive measures and early detection and treatment of any abnormalities that may lead to complications, and provide mobility and independence to individuals with diabetes to improve their quality of life.

Keywords: Diabetes mellitus, diabetic foot, diabetic foot ulcer, foot care, peripheral neuropathy, patient education, prevention, self-care.

1. Introduction

Diabetes mellitus is a persistent metabolic condition marked by relentless hyperglycaemia due to insufficient insulin production, affected insulin effect or a combination of the two. The chronic diabetes may add to the problems of the

cardiovascular system, kidneys, eyes, peripheral nerves, and lower extremities. One of these complications is the diabetes-associated foot disease, which is an essential clinical and public-health issue since ulceration can lead to infection, tissue destruction, hospitalization and lower-limb amputation.

Complications of diabetic foot arise interactively via a number of pathways especially peripheral neuropathy, peripheral arterial disease, repetitive mechanical load, foot deformity and unrecognized trauma. Destruction of protective sensation can make patients unaware of wounds, and a defective blood flow can slow down the repair of tissues. Risk factors early detection and proper preventive foot care becomes, therefore, crucial parts of diabetes management (Bus et al., 2024; American Diabetes Association Professional Practice Committee, 2026).

2. Risk Factors and types of diabetes.

There are various risk factors of Type 2 diabetes: some of them require modification but are not changeable; these include family history, age, overweight or obesity, lack of exercise, high blood pressure, abnormal lipid, and smoking.

Autoimmune destruction of the pancreatic beta cells is the major cause of Type 1 diabetes that causes intense insulin deficiency. Similarly, type 2 diabetes is a complex of insulin resistance with the development of insulin secretion deterioration.

Irrespective of the type of diabetes, long-term management should be applied in order to reduce the risk of vascular, neurological, renal, and other complications.

3. Diabetes Mellitus.

Management of diabetes requires glycaemic control that is customized, healthy eating, physical exercise, compliance with medical drugs, blood pressure and lipid control,

abstinence smoking, and routine medical check-ups.

Education of patients is also significant since a lot of diabetes care is accomplished by the means of self-care. Education should then be given to individuals on the proper management of blood glucose, healthy lifestyle, medication compliance, awareness of complications and foot care prevention.

4. Diabetes-Related Foot Disease

Interaction between peripheral arterial disease and peripheral neuropathy combined with mechanical stress or trauma usually leads to diabetes-related foot disease. A neuropathy may decrease the sensitivity to pain, temperature, pressure or injury. As a result, small injuries will go undetected and deteriorate until medical care is taken.

Peripheral sexual disease may also be a complicating factor that diminishes the supply of blood to the limbs and affects the healing of wounds. Foot deformity, inappropriate shoes, the formation of a callus, the presence of a past ulcer, past amputation, kidney disease, poor vision, as well as the inability to perform a self-care technique can also contribute even more towards risky foot complications (Bus et al., 2024).

5. Risk Factors of Diabetic Foot Ulceration.

Salient variables relating to diabetes foot ulceration are:

- Lymphedema, loss of protective sensation, and peripheral neuropathy.
- Peripheral arterial disease

- Past foot ulcer or amputation of lower limb.
- Abnormal pressure and foot deformities.
- Abnormality of the skin and calluses.
- Unsuitable or ill-fitting footwear.
- Poor glycaemic management
- Smoking
- Kidney disease
- Visual impairment
- impaired mobility or a disability to check the feet satisfactorily.

It is especially important to pay attention to the past ulceration as the presence of a healed ulcer does not heighten the risks. There is a need of continuous prophylactic management then after the healing of ulcers.

6. Signs and Symptoms

Awareness of the presence of abnormality like redness, swelling, warmth, blisters, cracks, calluses, colour changes, nail problems, drainage, wounds, or ulceration, should be taught to the patients and their caregivers. Sensory alterations such as numbness or tingling, pain or burning, or a loss of pain sensation, can also be signs of peripheral neuropathy.

Notably, in the circumstances of loss of protective sensation, serious foot problems can manifest themselves without much pain. As such, the lack of pain cannot be deemed as an indication that a foot lesion is painless.

7. Prevention of Diabetic Foot Complications

The key to modern diabetic-foot prevention is risk-based assessment instead of offering the same advice to all patients. Patients with diabetes also need to be evaluated in terms of the presence of neuropathy, peripheral arterial disease, amputation or ulceration, and deformity, among the other conditions that predispose them to ulcers (Bus et al., 2024).

The level of risk should then be applied to preventive care. Patients with a loss of protective sensation, peripheral arterial disease, deformities, or past ulceration should have more regular surveillance and specialized preventive care than individuals without exposure to any major risk factor(s).

Integrated care is also highlighted in current recommendations with regard to individuals who have moderate or high-risk. This could involve professional foot care, proper footwear, patient education, routine examination and dealing with the applicable risk factors.

8. Daily Foot-Care Practices

Self-care is also another aspect of prevention that is done daily. Patients with diabetes and especially those who are usually considered to be at risk ought to be advised to:

1. Check feet every day to observe cuts, blisters, redness, swelling, cracks and wounds.
2. Check with a mirror or seek the assistance in case the soles are not easily checked.
3. Clean feet frequently with warm water in a comfortable way.

4. Wipe the feet dry especially between toes.
 5. Apply the right moisturizer on the dry skin without taking too much moisture between the toes.
 6. Keep the feet out of the excessive heat and cold.
 7. Wear no more than the risk of injury by walking bare foot.
 8. Inspect shoes prior to wearing, stones, sharp objects or broken surfaces.
 9. Wear good quality and safety footwear.
 10.]Keep nails in good condition.
 11. Do not self-treat corns, calluses, or wounds in an unsafe manner.
 12. Report injuries, ulcer, infection, swelling or any notable alterations of colour as soon as possible to a health professional.
- Foot care assistance could be necessary in patients with poor vision, neuropathy, vascular disease, mobility issues or inaccessibility of their feet.

9. Shoes and Pressure.

Proper footwear is a very crucial aspect of diabetic-foot prevention. Shoes must be supportive enough to be of help and should not cause excessive pressure, friction or trauma.

Based on individual footwear advice should be given instead of thinking that a certain type of shoe fits all diabetic patients. Patients who have foot deformity, protective sensation loss, any prior ulcer or other predisposing factors might be in need of therapeutic footwear or professional Foam adjustments to prevent risky plantar pressure (Bus et al., 2024).

Patients who had a prior history of plantar ulceration may be specifically in need of properly prescribed pressure-relieving footwear to help them prevent recurrence.

10. Patient Education

Effective prevention revolves around education. Nevertheless, mere provision of information might not be adequate to yield long term behavioural change. Education then should be realistic, repeated, cognizable, and should be tailored to the patient needs.

Lectures and illustrations may involve the inspection and demonstration of feet, footwear choices, nail and skin care, identifying any warning signs and responding to abnormalities appropriately. Return demonstrations may assist healthcare professionals to know whether patients got the necessary understanding and are capable to do recommended practices correctly.

Patients who cannot provide self-foot care due to visual impairment, lack of mobility, cognitive and other factors should have their family members or caregivers involved.

11. Nurse and Health Professionals role.

The role of nurses in diabetic-foot preventive activities is significant as they often engage in diabetes education, assessment in clinical settings, and community-based care as well as long-term follow-ups. Nursing roles can involve, but are not limited to, assessing the skin integrity, risk factor identification, self-care evaluation, patient and family teaching, strengthening preventive behaviours and referring patients out at risk once abnormalities have been detected.

The best way to prevent this is by having care coordinated between relevant healthcare persons. This can include physicians, specialists in diabetes, nurses, podiatrists, vascular specialists, wound-care

specialists, orthotists, surgeons, and rehabilitation specialists, depending on the condition of the patient.

As of 2010, new trends have become common in the prevention of diabetic foot.

Recent directions are strongly focused on the stratification of risks, multidisciplinary care, prevention of ulcer recurrence, and individual interventions. The prevention guidance on the Diabetic Foot (IWGDF) published in 2023 specifically highlights the importance of risk identification, providing the patient with proper education, treating the pre-ulcerative lesions, and wearing the right footwear, as well as offering the integrated provision of foot care to patients at moderate or high risk (Bus et al., 2024).

Foot-temperature monitoring is another emerging technology. Recurrent rises in local foot temperature may possibly predict inflammation or over-mechanical loading prior to the onset of evident ulcer. It is indicated that temperature-monitoring interventions can potentially be useful in the individuals who are highly vulnerable to frequent ulceration provided that the knowledge results in proper preventative performance (Van Netten et al., 2024).

Digital health technologies are also increasingly being investigated. To aid in patient education and early detection of abnormalities, the use of smart phone applications, remote monitoring, electronic reminders, telehealth, image-based assessment and artificial-intelligence-assisted systems can be used. Yet, these technologies are still the supplementary tools and they cannot substitute clinical assessment, professional foot care and recommended preventive solutions.

12. Significance of Prevention of Recurrent Ulceration.

One of the most crucial concepts that have been developed recently is that even after the healing of an ulcer, the risk of the diabetic foot disease is still present. Those who have undergone ulceration in the past are at a high risk of getting a new ulcer.

Prevention in the long term must thus involve frequent surveillance, taking care of the calluses, pre-ulcerative lesions, therapeutic foot shoes, patient education, and prompt professional examination of emerging abnormalities. Recurrence prevention must be seen as a continuous part of diabetes control as opposed to a transient measure.

13. Conclusion

Foot disease is a severe complication of diabetes which may result in ulceration, infection, hospitalization, disability, and amputation. Some of the significant components that lead to the development of peripheral neuropathy are peripheral neuropathy, peripheral arterial diseases, preexisting ulceration, foot deformity, mechanical pressure, unsuitable footwear, and lack of proper self-care.

To prevent effectively, there should be systematic evaluation of risk, foot care on daily, proper footwear, proper overall management of diabetes, education of the patient, and early intervention by a professional. The current advice is especially focused on the screening based on risks, the use of the multidisciplinary care model, and the further monitoring of individuals with the past ulceration or other risk factors.

Education of the patient, assessment of risk, reinforcement of proper self-care and prompt referral are the key tasks of nurses and other healthcare professionals. New technologies, like home temperature check and digital health programs, can contribute to further preventive assistance of the targeted patients. In the end, patients, caregivers, and healthcare professionals have to continuously work together in order to minimize the number of avoidable foot complications and maintain mobility, independence, and quality of life.

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