EDITORIAL

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Holistic Management of Diabetic Foot: Redefining Strategy

Diabetes Mellitus is one of the most significant global health emergencies of the 21st century. In 2021, it was estimated that 537 million people had diabetes, and this number is projected to rise to 643 million by 2030.[1] According to the Malaysian National Health and Morbidity Surveys, the prevalence of diabetes locally has increased from 13.4% in 2015 to 18.3% in 2019.[2] Malaysia ranks high in the list of top 20 countries globally and has the highest prevalence in Southeast Asia, with an estimated current diabetes population of approximately 3.9 million people.

One notable complication of Diabetes is the diabetic foot which is defined as an infection, ulceration, or destruction of foot tissues associated with neuropathy or peripheral arterial disease. Approximately 15% of patients will develop a lower extremity ulcer during their disease. A 'foot at risk' refers to a pre-ulcerated foot of a diabetic patient that has the potential to develop ulcers and is identified according to the King's classification by the presence of one or more risk factors for diabetic foot, such as ischemia, neuropathy, callus, deformity, or swelling.[3]

It is of note that 70% of all non-traumatic amputations are performed on diabetic patients, with the major amputation rate being 15 times higher than that of the general population. Furthermore, a diabetic patient who has undergone a lower limb amputation has a 50% chance of developing a severe lesion in the second limb within two years.

Majority of our diabetes patients tend to seek medical care only when complications have already arisen resulting in amputation. This has devastating effects on a person's life, including loss of social function and higher economic demands for treatment, rehabilitation, and prostheses. A prospective study conducted on the presentation and surgical outcomes of diabetic foot patients admitted to a tertiary hospital in Kelantan revealed that the amputation rate was 40.0%, with 14.3% of the patients undergoing major amputations. It is estimated that around 85% of such amputations could be prevented if detected early and managed effectively by healthcare professionals.[4]

Addressing this affliction is a dire need. A holistic approach to management of diabetic foot complications is a necessity and requires a comprehensive strategy that encompasses physical, mental, and psycho-spiritual care. The strategy should incorporate pre-hospital preventive measures, a multi-disciplinary team approach in the hospital setting, and post-hospital care.

The main components of Pre-Hospital Preventive Strategies include Regular Foot Assessment and Screening for High-risk Foot, establishment of a dedicated Foot Protection Team and ensuring optimal Blood Sugar Control. These measures should be complimented by Diabetic Education and Awareness strategies.

The prevalence of diabetic foot at risk was 31.3% for patients attending primary care clinics and 57.7% for hospitalized patients with diabetes in Kuantan. There is an urgent need for a properly structured screening program to identify the diabetic 'foot at risk' early and to hasten intervention.

Regular foot care, foot hygiene, annual foot examinations, and appropriate footwear are crucial in preventing foot problems like deformity, ulceration, and infection. Interval and thorough foot examinations to identify the 'foot at risk' include simple monofilament tests, vibration and light touch assessments for neuropathy, and palpation of peripheral pulses. Paedobaromatric study is a quantitative tool to evaluate foot pressure. Sinnasamy S et al. noted that the plantar foot pressure is elevated in the 'high-risk foot' group compared to the control group. It also showed a strong correlation with poor diabetic control (HbA1c >6.5%).

A dedicated foot protection team constitute a team of healthcare professionals with specialist expertise in assessing and managing foot disease in diabetes. MOH has proposed foot protection team to be established at primary care level, led by a Family Medicine Specialist, supported by a diabetic nurse, wound care team, and rehabilitation services. A study on diabetic foot protection services by primary care clinics showed that it could help early detection and referral. It was also shown to reduce complications of diabetic foot, the cost of the treatment as well as the psychological impact faced by the patients.

Another vital component is Glycaemic control. Minimization of hypoglycaemia in the prevention of diabetic foot should be individualized and optimal glycaemic control is essential to prevent complications.

Diet control for diabetic foot patients involves maintaining a well-planned type of diet that can help maintain and repair tissues, aid in wound healing, and promote overall physical well-being. Ensuring adequate protein consumption is important for strong and healthy feet, as proteins help maintain and repair tissues. A registered dietitian may be the best way to design a diet for diabetic foot patients, taking into account their age, weight, and activity level.

Patients with neuropathy tend to ignore signs of injury due to atypical pain response. This will influence the patient's adherence to self-care. Thus, Diabetic Education and Awareness on foot care is crucial to reduce diabetic foot complications. Regular patient education can be provided by a physician or skilled nurses providing on basic care of the foot, callus, and nails. Healthcare professionals providing foot-care education should receive regular and updated information on identifying patients at risk for foot ulceration.

A Multi-disciplinary Team Approach in Hospital is a requirement to effectively manage diabetic foot issues requiring the collaboration of a diverse team of specialists. Establishing a dedicated diabetic foot clinic within a hospital facilitates this approach, encouraging timely diagnosis and treatment. Regular meetings and consultations among team members, including joint ward rounds and clinical sessions, are essential for cohesive care delivery. Some team members may have overlapping roles based on their expertise and interests. This globally recognized approach has significantly reduced amputation rates, shortened hospital stays, and proved cost-effective, ultimately enhancing patients' quality of life.

One other aspect is Preventive foot surgery to prevent foot ulceration or re-ulceration in patients with diabetes. It is important to consider a history of previous ulceration or amputation when assessing a patient for preventive surgery to set a treatment strategy and determine prognosis. Procedures, that need to be performed by trained orthopaedic doctors, like gastrocnemius recession, Achilles tendon lengthening, percutaneous tenotomy, and osteotomy. The goal is to produce a balanced foot and correction of deformities.

Wound care is a vital component of this strategy and typically involves wound debridement, advance dressing, offloading footwear, systemic and local infection control. These approaches are often tailored to the specific needs of the patient and the characteristics of the ulcer, to promote healing, prevent complications, and preserve limb function. A microbiological profile study of patients with diabetic foot infection provides a guide to the most appropriate empirical antibiotics.[5] A prospective study to compare the effect of honey dressing for diabetic foot ulcers with a controlled dressing group (povidone-iodine followed by normal saline) showed a mean healing time of 15.4 days in the standard dressing group (range 9-36 days) compared to 14.4 days (range 7-26 days) in the honey group ($p<0.005$). Honey dressing can be considered a safe alternative dressing for foot ulcers.[6]

Treatment strategies include Surgical procedures and reconstruction techniques for diabetic foot problems. They vary depending on the severity of the condition and the specific needs of the patient. Some common types include amputation, debridement, arthrodesis, revascularization, flap surgery, and Charcot foot reconstruction. These interventions are often combined with comprehensive wound care and multi-disciplinary management to achieve the best outcomes for patients.

Integration of spiritual care into the overall medical management, recognizes the importance in promoting holistic well-being and healing. Spiritual care for diabetic patients can provide important emotional and psychological support, complementing medical treatment. Some interventions of spiritual care include spiritual assessment, active listening, religious counselling, Solah and meditation, and connecting patients with supportive community, religious or spiritual leaders.

Post-hospital Care Management is mandatory for successful outcome. It involves Patient-Diabetic Foot Self-care consisting of foot care, foot inspection, footwear and foot ulcer prevention. Knowledge of self-care including general foot care in terms of proper foot washing, checking the temperature of water used for washing, drying the toes and in between the toes, using moisturizer cream, and gently filing or removing calluses.

After amputation, managing diabetes and taking care of the remaining limb is crucial to prevent further complications and improve quality of life. This includes regular exercise, monitoring blood sugar levels, and addressing any health inequities that may impact recovery and access to resources like prosthetic limbs and physical therapy.

Diabetic foot problems are increasing at an alarming rate and requires urgent action from all stakeholders to ensure appropriate control measures. This account highlights the complex nature of managing this serious issue, emphasising a holistic approach in patient management.

REFERENCES:

1. IDF, International Diabetes Federation (2021). IDF Diabetes Atlas, 10th Ed. SBN: 978-2-930229-98-0I. www.diabetesatlas.org.
2. CPG, Ministry of Health Malaysia (2018). Clinical Practice Guideline: Management of Diabetic Foot. 2nd Ed. Kuala Lumpur: MOH/P/PAK/411.18(GU)-e.
3. Azmi NH, Md Aris MA, Abdul Hadi A, Nasreen HE, Che Ahmad A (2020). Prevalence and associated factors of diabetic foot at risk among type 2 diabetes mellitus patients attending primary health clinics in Kuantan. IIUM Med J Malaysia, 19 (3). pp. 11-19. ISSN 1823-4631
4. Muhammad-lutfi AR, Zaraihah MR, Anuar-ramdhan IM (2014). Knowledge and Practice of Diabetic Foot Care in an In-patient setting at a Tertiary Medical Center. Malaysian Orthopaedic Journal, 8(3), 22–26.
5. Kow RY, Low CL, Ayeop MAS, Che Ahmad A, Shukrimi A (2022). Characteristics and microbiological profile of patients with diabetic foot infections in Kuantan, Pahang. Malaysian Orthop J, Vol 16 (1). pp. 11-17. ISSN 1985-2533
6. Shukrimi A, Sulaiman AR, Halim AY, Azril A (2008). A Comparative Study Between Honey and Povidone Iodine as Dressing Solution for Wagner Type II Diabetic Foot Ulcers. Med J Malaysia Vol 63 No 1 March 2008.

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