Foot ulcers are a serious complication of diabetes that are associated with adverse consequences and high costs, as well as having a significant impact on quality of life. In this case, a man was brought to a clinic in Iran with a diabetic foot ulcer of 1 month’s duration. He had seen several physicians, and the decision had been made to amputate his leg. However, when he was seen at the authors’ clinic he was reassured that amputation could be prevented and given a treatment plan that was managed by specialist nurses. Although such specialist training is not widely available in Iran, it would positively improve wound healing outcomes.
PHYSICAL EXAMINATION

Mr A’s lesion measured 4 cm x 3 cm with an ulcerated area at the base of the fourth and fifth metatarsal involving the interdigital cleft and extending to the forefoot. His dorsalis pedis artery and posterior tibial artery pulses were feeble. Postural hypotension was present. Sensory impairment was revealed by the 10-g monofilament test[1]. On close examination, the swelling showed callosity and a grade 2 ulcer, as measured by the Wagner grading system for diabetic foot ulcers[2]. However, Mr A reported no pain from the ulcer. On probing the wound with a blunt, sterile probe, it was found to be of full thickness, extending to the underlying bone. Neurological assessment with vibration perception threshold revealed a loss of sensation in both of Mr A’s feet. Further observations are highlighted in Box 1.

Mr A did not wear appropriate shoes, and frequently wore shoes without socks. The shoes in question had a tough inner lining and a bulky section within the toe area. There was insufficient space lengthwise to accommodate his feet properly, and the sides bulged when worn.

TREATMENT AND MANAGEMENT

The management of diabetic foot ulceration is based upon the principles of wound debridement, identification and management of infection, the use of dressings to maintain a moist healing environment and offloading/redistributing pressure away from the wound[3].

Mr A’s treatment started with ciprofloxacin 400 mg intravenously twice-daily and metronidazol 500 mg three times a day. The wound was debrided to healthy tissue and the sides bulged when worn.

An appropriate hydrocolloid dressing (Comfeel®, Coloplast) was selected as a primary dressing to absorb the exudate and provide a moist environment for healing. A secondary polyurethane foam dressing, Allevyn® (Smith & Nephew), was applied. These dressing were chosen as they are semi-permeable to water vapour, occlusive to wound exudate and absorbent[4]. Additionally, they are available in Iran (as some medical products are sanctioned) and were acceptable to Mr A.

Home care was made by the practice nurse for redressing within 48 hours, and a weekly review appointment was made within the diabetic foot clinic. For blood pressure control, the angiotensin-converting enzyme inhibitor enalapril 5 mg/day was commenced. Mr A also improved his insulin regimen and began to achieve optimum blood glucose levels. It is important to maintain the principles of optimum wound management; at each visit, Mr A’s wound was assessed by the trained nurse for signs of infection, as infection in the diabetic foot can spread rapidly[5].

During the first week, the diameter of the wound remained the same, but the exudate had decreased considerably. Mr A’s blood glucose was under control and slight physical activity was initiated by the nurses. Two weeks after initiation of treatment, the diameter of the wound was 2.5 cm x 3 cm. Systemic antibiotics were discontinued and oral antibiotics were started (amoxicillin 500 mg every 8 hours and ciprofloxacin 500 mg every 12 hours). The dressing had been changed twice a week by the nurse. During this time, Mr A and his family had been taught how to change the dressing, how to interpret glucose meter readings, and how to administer appropriate insulin dosages.

By week 4, the diameter of the wound was 1.0 cm x 1.5 cm. Mr A was completely satisfied with the care he had received and the treatment process.

By week 6, the wound had reduced to 0.5 cm x 0.5 cm, the oral antibiotics were stopped and Mr A had learned how he could take care of his foot, how to clean his foot and nails, and how to choose suitable shoes. He was also aware of appropriate physical activity, and he and his family had learned how they could screen Mr A’s foot. He agreed to come to the clinic for follow-up appointments and screenings at least every 3 months. Mr A’s ulcer was fully healed by week 12.

SPECIALIST NURSE TRAINING

At the Emam Khomeini Clinic, all nurses are trained in educating people with diabetes, particularly those at risk of foot ulcers. This enables them to become familiar with the basics of foot care, teaches them how to perform physical examinations and to take care of their feet on a daily basis, and encourages them to carry out a series of simple tasks in order to help prevent foot ulcers or recurrence. Tasks include checking shoes before wearing them, keeping feet clean, continued care of the skin and nails, maintaining good blood glucose control, regularly changing the dressing, and moisturising and cleaning the wound.

DISCUSSION

Trauma to the foot in people with diabetes is one of the most important factors in the development of an ulcer, particularly in the presence of sensory impairment.
neuropathy. Although this trauma could be a puncture wound or a blunt injury, the most common one is repetitive stress trauma[9], such as that caused by Mr A’s unsuitable footwear.

Foot ulcers are a serious complication of diabetes that are associated with adverse consequences and high costs, as well as having a significant impact on individuals’ quality of life[10]. Care of this group demands a multidisciplinary approach[8]. A specialised, interdisciplinary team should work closely with patients and their families to effectively manage and treat diabetic foot ulcers[6], as evidenced in Mr A’s case. However, this level of care is not yet accessible to all people with diabetes in Iran, and few patients with foot ulcers receive effective wound management[11].

In a study in Mazandaran, Iran, of 520 people with diabetic foot problems[12], it was clear that inappropriate quality of ulcer and foot care occurred in 54% and 66% of participants respectively, and most people were treated surgically (28% debridement and 57% amputation). The authors concluded that the main reason for this inappropriate service was the lack of nurses trained in wound management in the country.

Although some people with diabetes, particularly those with foot ulceration, believe that their condition should be treated by physicians (as Mr A and his family believed at first), the role of non-physician healthcare providers has been accepted by patients in many countries[8]. Nurses are well placed to provide high-quality care and to undertake a leading role in wound management, specifically in the care of people with diabetes[6]. Furthermore, nurses can facilitate and positively influence wound healing outcomes by promoting, collaborating, and participating in interdisciplinary care teams[12].

However, the role of nurses in Iran and other developing countries is unclear, and there is a lack of a defined philosophy for nursing in Iran. Nurses are well placed to provide effective foot ulcer management and treatment; however, nurses in some developing countries, such as Iran, highlight a lack of specialist training as an obstacle to effective healthcare provision.

CONCLUSION

Patient education, comprehensive foot screening, correct dressing choice, effective debridement, and routine follow-up, are the most effective strategies in preventing and managing diabetic foot ulcers. Specialist nurses are well placed to provide effective foot ulcer management and treatment; however, nurses in some developing countries, such as Iran, highlight a lack of specialist training as an obstacle to effective healthcare provision.

Fortunately, in Mr A’s case, his foot was saved from amputation as a result of the optimal home wound care and follow-up treatment he received from the healthcare team, particularly the trained nurses. Moreover, Mr A’s quality of life improved, enabling him to interact and integrate socially within his environment, to participate in diabetes group activities and classes after becoming mobile and to enjoy his improved wellbeing.

However, from this case and many similar cases in Iran and other developing countries, it is clear that there is a lack of services that are mainly provided by specialist nurses. In Mr A’s case, despite benefitting from this service, his infected ulcer would not have initially occurred had his feet been screened regularly, had he been taught about personal foot care sooner, and if he and his family had trusted the nurse’s abilities.

A multidisciplinary team approach is needed to deal with the complexity of the diabetic foot ulcer, and nurses should be provided with skills for effective management. The main components of a diabetic foot service, such as education, screening, wound management and follow-up for preventing recurrence, may be provided by trained nurses, as is happening in many countries such as the UK. Currently, nurses have shown a strong commitment to change and improve the healthcare services and systems in Iran. Nursing in Iran has seen great progress in recent years. Restructuring nursing services in Iran would eliminate barriers to poor-quality nursing care, inadequate educational preparation, role ambiguity and low self-esteem among nurses.

References