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# Management of heel pressure ulcers among inpatients with diabetes

## KEY WORDS

- ▶ Diabetic foot ulceration
- ▶ Pressure ulceration
- ▶ Major limb amputation

Approximately 6000 people with diabetes undergo leg, foot, or toe amputations each year in England, many of which are avoidable. The risk of lower extremity amputation for people with diabetes is  $\geq 20$  times that of people without diabetes. Major amputation rates in people with diabetes vary ten-fold across primary care trusts (Diabetes UK, 2012). The preceding event to limb amputation is often ulceration. This article discusses the management of heel pressure ulcers in patients with diabetes and questions whether there is a need for clearer guidance in regard to who is responsible for the patient's care during a hospital stay. Additionally, the authors discuss whether care pathways need to be revised to ensure that patients are optimally managed, which could ultimately reduce the number of avoidable foot problems developing during acute hospital stays.

Prevalence of diabetes among adults is rising. In 2011, 5.5% of the adult population in England and Wales were diagnosed with diabetes (NHS Diabetes, 2011) and 4.7% were diagnosed in Scotland, with a further 0.9% estimated as being undiagnosed (NHS Scotland, 2011). It is reported that in 2013 7.8% of the adult population in England will have diabetes (diagnosed and undiagnosed), and this is predicted to reach 8.5% in 2020 and 9.5% by 2030 (Association of Public Health Observatories, 2012).

The care of people with diabetes presents a significant financial burden to the NHS. The current total annual cost of direct patient care (treatment, intervention, and complications) is estimated to be £1 billion for people with type 1 diabetes and £8.8 billion for those with type 2 diabetes (Hex et al, 2012). The majority of these costs are spent on primary care services, but diabetic care also has a significant impact on secondary care budgets. The NHS in England spends more than £2 billion a year on inpatient care for people with diabetes, which equates to approximately 11% of the total NHS inpatient care expenditure (NHS Diabetes, 2011).

People with diabetes are more likely to be admitted to hospital and experience a longer hospital stay when compared to others of a similar age admitted for similar conditions (NHS Diabetes, 2011). With so many people with diabetes requiring acute inpatient care, we need to ensure the care

they receive is appropriate. However, the National Diabetes Inpatient Audit (2010) found that there was cause for concern regarding the care of inpatients with diabetes in most hospitals. The Health and Social Care Information Centre (2012) repeated the audit in 2011, which showed some improvement, but there were still areas of concern. Nearly half of all diabetes-specific admissions were for foot disease and, of these, less than two-thirds were referred to a multidisciplinary foot care team (MDFCT).

NICE (2011) recommends that a MDFCT should manage the care pathway of people with diabetic foot problems who require inpatient care. The guideline states that the MDFCT should include a diabetologist, a surgeon with the relevant expertise in managing diabetic foot problems, a diabetes nurse specialist, a podiatrist, and a tissue viability nurse (TVN).

Within England, specialist podiatrists are part of the MDFCT in 78% of cases, but TVNs are only present in 23% of teams; a further 71% of hospital sites reported that a TVN was not a member of the MDFCT, but was accessible when needed. Some 7.1% of hospital sites reported they had no access to a specialist podiatrist and 5.5% of sites did not have access to a TVN service (Health and Social Care Information Centre, 2012). Within Wales, the figures were slightly improved; 72% of sites had a specialist podiatrist within their MDFCT, but 100%

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***“Heel ulceration is reported to be the second most common type of pressure ulcer.”***

of the sites reported having access to services when required. TVN presence in Wales was also slightly higher, at 39%. However, 5.6% of sites reported they had no access to tissue viability services (Health and Social Care Information Centre, 2012).

SIGN (2010) also recommends that people with active diabetic foot disease should be referred to a MDFCT. The membership is similar to that of NICE (2011), but SIGN does not state the need for a TVN on the team.

Inpatient care for people with diabetes was identified as a key area for improvement in the NHS Operating Framework for 2011/2012 (Department of Health, 2010). The framework set the priority that “NHS providers should consider the overall management of inpatients with diabetes in order to reduce their length of stay, improve their experience of care, ensure that patients do not develop diabetic foot complications while in hospital, and that their blood glucose is managed safely”.

It is reported that up to 100 people a week in the UK have a limb amputated as a result of diabetes. People at highest risk are those who have a previous history of ulcers, neuropathy, or nerve damage and circulatory problems (Diabetes UK, 2009). It is therefore concerning that in 2011 only 26.8% of inpatients had documented evidence of a foot examination being performed at any time during their hospital stay (Health and Social Care Information Centre, 2012).

In 2009, the NHS Institute for Innovation and Improvement highlighted eight “High Impact Actions for Nursing and Midwifery”, one of which was called “Your Skin Matters”. This action has the goal of “no avoidable pressure ulcers in NHS care” (NHS Institute for Innovation and Improvement, 2009).

An intrinsic part of pressure ulcer prevention is the comprehensive assessment of the skin for every inpatient, so why is there such a low proportion of documented foot inspections? Is it because diabetic foot assessment and pressure ulceration assessments are seen as two separate entities?

During a hospital stay pressure ulcers most commonly occur on the heels and overall heel ulceration is reported to be the second most common type of pressure ulcer (Fowler et al, 2008). Risk factors for developing heel pressure ulcers include peripheral arterial disease, diabetic neuropathy, immobility of lower limbs due to

surgery, paresis, structural deformity, and dementia (Younes et al, 2004; Gefen, 2010).

Diabetes is a major risk factor for heel pressure ulcers because it is frequently associated with peripheral arterial disease. Adding to the complications, arteriosclerosis tends to affect the distal vessels, which are less amenable to revascularisation. The European Pressure Ulcer Advisory Panel (EPUAP) and National Pressure Ulcer Advisory Panel (NPUAP; 2009a) recommend that every patient in any healthcare setting should be assessed regarding the risk of pressure ulceration and that strategies should be implemented to aid in preventing pressure ulcer formation.

Risk calculation is often performed through the use of a tool such as the Waterlow Score or Braden Scale. These tools highlight that diabetes increases pressure ulcer risk, but neither tool requires the assessment of peripheral pulses or neuropathy. It is widely accepted that careful foot examination testing for neuropathy and arterial insufficiency can identify people who are at risk of developing heel ulcers. Within a community setting, people with diabetes, as a minimum, undergo annual foot assessments, which include palpation of foot pulses, foot sensation testing, inspection for any deformity, and of footwear. Following this assessment, patients are classified as low risk, increased risk, high risk, or ulcerated foot (NICE, 2004).

If a patient is admitted into secondary care, are the results of the foot risk assessment readily available to the hospital team? Should all patients with diabetes undergo foot assessment on admission to determine risk of developing ulceration?

Diabetes UK (2009) and NICE (2011) both enforce best practice standards for patients with active foot problems, but are there further improvements that can be made by ensuring patients with diabetes but without ulceration are risk assessed and appropriately managed?

In terms of underlying pathology, a heel pressure ulcer on a patient with diabetes and a diabetic foot ulcer are often identical, as the reduction of the blood and or nerve supply reduces the tolerance of pressure. In terms of management, national variations exist and in some hospitals the patients are managed solely by the tissue viability services without the involvement of the MDFCT. In other locations, however, patients are referred directly to the MDFCT.

Guidance for pressure ulceration (European Pressure Ulcer Advisory Panel, National Pressure Ulcer Advisory Panel, 2009b) does recognise the need for a focused physical examination, which includes factors that may affect healing (e.g. impaired perfusion, impaired sensation, systemic infection) and vascular assessment in the case of extremity ulcers (e.g. physical examination, history of claudication, and ankle brachial pressure index or toe pressure). EPUAP and NPUAP fail to mention the need for sensation testing in the patient with diabetes as well as to highlight the potential benefits of referring patients with heel pressure ulcers to the MDFCT.

As previously discussed, in 23% of hospitals the TVN is part of the MDFCT, but what is the process for the other 77% of organisations? Who is ultimately responsible and accountable for the patient's care? Do the current pathways comply with NICE (2011), which recommends a MDFCT should manage the care pathway of people with diabetic foot problems who require inpatient care?

Of all the ulcers seen in people with diabetes, heel ulcers are the most serious and often lead to below-the-knee amputation (Younes et al, 2004). The management of heel ulcers requires a thorough knowledge of the major risk factors for ulceration in the heel area and a standardised programme of local ulcer care, metabolic control, early control of infection, and improvement of blood supply to the foot (Younes et al, 2004).

If patients are appropriately risk assessed, then suitable interventions can be initiated to help prevent ulcer formation. These include maintaining good skin condition, repositioning the patient at regular intervals, providing appropriate equipment (mattresses, foam or air elevation devices specifically for the heel), and patient education regarding foot hygiene, skin care, and appropriate footwear. However, Wijenaikke and Leese (2001) suggest that people with diabetes require additional protection, other than merely repositioning the patient on a specialised mattress, to prevent and manage heel pressure ulceration.

## CONCLUSION

Pressure ulcers on the heels occur frequently and lead to significant morbidity and mortality. All patients with diabetes are at risk of developing

foot problems. Currently, pressure ulcer risk-assessment tools do not accurately identify the risk factors relating to changes in arterial blood flow, neuropathy, and lower limb weakness (Black, 2012).

In addition, there are inconsistencies about who is responsible for the care of patients with diabetes that develop heel pressure ulceration while in hospital care. The introduction of diabetic foot risk assessments on admission into acute care settings, together with the recommendation that all patients with diabetes who develop heel pressure damage should be referred to the MDFCT, could help to significantly reduce the risk of lower-extremity amputations as a result of heel ulcers. **WUK**

*“Management of heel ulcers requires a thorough knowledge of the major risk factors for ulceration in the heel area.”*

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