

Foot ulceration in a non-diabetic population: a cross-sectional audit of staff in one health district

Patients without diabetes are increasingly presenting with foot ulcers at podiatry clinics. This audit found that the prevalence of non-diabetic foot ulcers was 0.21% in patients over 60, pointing to a need to set up non-diabetic foot ulcer clinics

non-diabetic foot ulcers; health district; peripheral vascular disease; sensory neuropathy

Foot ulceration is encountered by more practitioners than just podiatrists. It has a diverse range of aetiologies (Table 1) and careful assessment and recognition of the causes are required to facilitate appropriate management.¹

The complications of diabetes mellitus, namely neuropathy, ischaemia and infection, are well-documented causes of foot ulceration.² Prevalence data for diabetic foot ulcers have shown that 7.4% of patient with diabetes mellitus have or have had a foot ulcer at some stage.³

Outwith diabetes, the prevalence of foot ulcers is difficult to elucidate. Much of the data have been recorded under the umbrella of 'leg ulcer' or in wound surveys that do not give foot-specific data.⁴⁻⁸

Data from our community podiatry department showed that an increasing number of non-diabetic patients were presenting with foot ulcers. While patients with diabetic foot ulcers have access to specialist clinics,⁹ non-diabetic patients with active foot ulcers are managed as part of the routine caseload. It was therefore deemed appropriate to audit the prevalence of non-diabetic foot ulcers in the local district.

Method

Following approval from clinical audit services, health-care professionals across a single health service district (population 610,805), involved in the management and treatment of foot ulcers were identified from staff records. These included practice and district nurses, ward staff, orthopaedic and vascular surgeons, dermatologists, podiatrists and hospital clinics. A total of 521 staff were identified.

From this, a quota sample¹⁰ was drawn. This technique ensured that the sample represented practice and district nurses from every general practice surgery in the district, as well as all of its podiatrists, dermatologists and orthopaedic and vascular surgeons. In total, 271 practitioners (52% of the district's staff) and four hospital clinics that treat

patients with foot ulcers were selected. The four hospital clinics were all held at the district general hospital and comprised:

- One orthopaedic foot clinic
- Two vascular clinics
- One leg ulcer clinic.

Identified staff were sent personally addressed letters inviting them to participate in the audit. Participants were asked to prospectively complete a questionnaire each time they encountered a foot ulcer on a non-diabetic patient during a fixed two-week period. All participants were asked to start data collection on the same date (8 December 2000) for a two-week period. Staff on annual leave were asked to begin their data collection as close as possible to the set date for a similar two-week period.

For the purposes of this project, an ulcer was defined as an open wound on the foot below the

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Table 1. Causes of foot ulceration

Arterial disease

Venous disease

Metabolic disorders

Vasculitis

Autoimmune disease

Infection

Neuropathy

Malignancy

Trauma

Pressure

Artefact

Haematological disease

Fig 1. Ulcer frequency by age

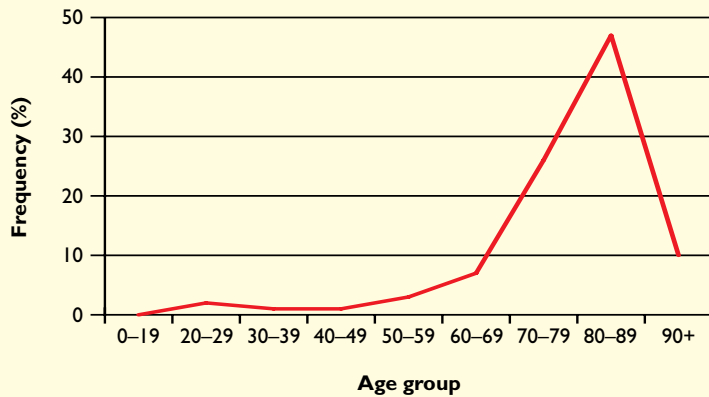


Fig 2. Location of the 132 reported ulcers

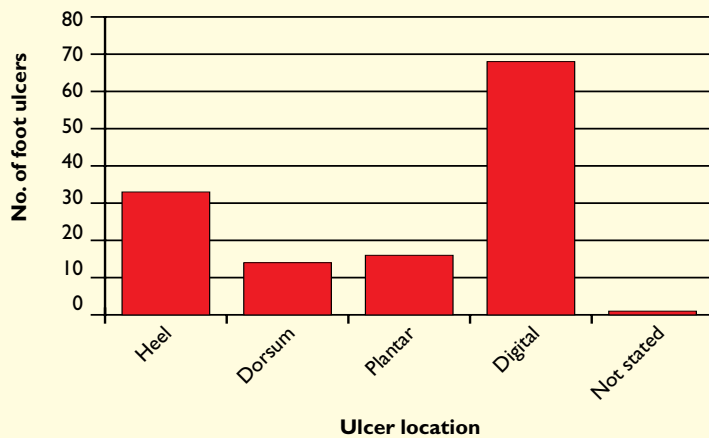
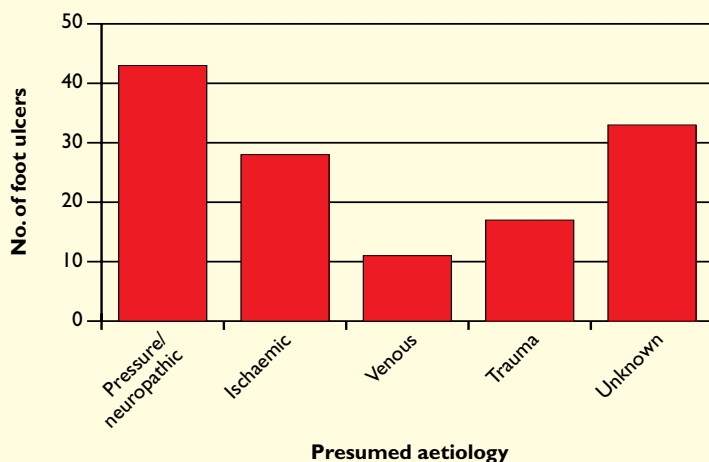


Fig 3. Presumed aetiology of the 132 reported ulcers



Results

Of the 271 staff and four hospital clinics sent questionnaires, 98 (36%) responded, reporting 132 foot ulcers in 128 patients after accounting for double registrations. Response rates were as follows:

- 50% of podiatrists (12/24)
- 48% of district nurses (54/112)
- 21% of practice nurses (29/135).
- 75% of hospital clinics (3/4).

Response rates from sectors across the health district were:

- 39%: central (city) district
- 20%: north
- 10%: north east
- 11%: south west
- 11%: west
- 9%: south east.

During the audit period, of the 132 foot ulcers, 74 (56%) were seen by practice and district nurses, 54 (41%) by podiatrists and the remaining four (3%) by hospital clinics. Sixty-nine (54%) ulcers occurred in females and 59 (46%) in males.

Although ulcers were reported in all adult age groups, there was a dramatic increase in number in patients aged over 60 (Fig 1), with the majority of ulcers (64%) in those aged 70 or over.

Ulcers were most commonly located on the digits (n=68, 52%), followed by the heel (n=33, 25%), plantar surface (n=16, 12%) and dorsum of the foot (n=14, 11%) (Fig 2). This pattern of location was observed regardless of whether it was reported by a district nurse, practice nurse or podiatrist.

Practitioners considered that neuropathy/pressure was the most common presumed aetiology (n=43, 33%), followed by ischaemia (n=28, 21%), trauma (n=17, 13%) and venous disease (n=11, 8%). Thirty-three ulcers (25%) were reported as having an 'unknown aetiology' (Fig 3).

Analysis of the professional involved in care showed that, for foot ulcers, both nurses' and podiatrists' caseloads were similar in their reported aetiological profile, containing predominantly neuropathic and ischaemic foot ulcers.

Of the total numbers of ulcers reported, 49 (37%) had been present for less than a month, 40 (30%) for 1-3 months, 10 (8%) for 4-6 months and 32 (24%) for six months or more. The results are summarised in Fig 4, divided by profession.

Discussion

The overall response rate of 36% was low, although similar response rates were seen across different sectors of the district. With the exception of the north and central sectors, which both have a large towns, each area has a similar population and response rate. The low number of returns could have been due to the proximity of data-collection dates to a public holiday or increasing staff workload.

Following data collection, report forms were returned identifying 132 foot ulcers across the district. Based on these figures and a county population of an estimated 610,805, the prevalence of non-diabetic foot ulcers was 0.02%.

As the data demonstrated a steep increase in the number of ulcers in patients over 60, recalculation of the prevalence suggested a prevalence of 0.21% or roughly two cases per 1000 in older subjects.

Comparative data are difficult to derive due to differing methodologies and the fact that many studies have amalgamated leg and foot ulcers together.

In a similar survey methodology, Lindholm et al.¹¹ reported a prevalence of 0.027%, although this also included diabetic foot ulcers.

A Swedish study of the Gothenburg population that reviewed medical records over a one-year period identified a prevalence of 0.063% for foot ulcers, although this also included diabetic subjects.¹²

Srinivasaiah et al.⁸ reported a prevalence of 0.10%, but this included leg ulcers.

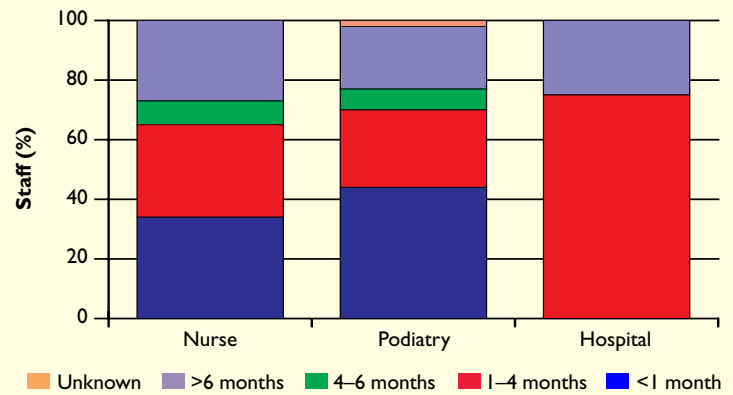
The true extent of the problem may be larger for a number of reasons. First, the narrow time frame used could only capture active ulcers, not those that had recently healed. Furthermore, these data exclude patients who self-treat; one study highlighted that the numbers of patients who self-treat leg and foot ulcers can double the prevalence, particularly in the 60–65 year age group.¹³ Moreover, older people are less likely to seek treatment for foot complaints as they often consider them part of ageing.¹⁴

Most of the ulcers occurred on the digits (52%) and the heel (25%). Surprisingly, very few were reported on the plantar surface (12%). Lindholm et al.¹¹ reported a similar pattern, with 48% on the toe area, 17% on the heel and 14% on the plantar surface. This is difficult to explain, but the high occurrence of digital ulcers may be due to footwear or ischaemia. Almost all of the ulcers were cared for by podiatrists and district and practice nurses in the community, with very few being seen in the hospital clinics.

Many of the ulcers were reported as neuropathic or ischaemic: 33% and 21% respectively. Plummer and Albert¹⁵ found that neuropathy and peripheral vascular disease affected 21% and 18% of their non-diabetic cohort (n=308 adults) respectively, although a dramatic rise in both was observed in patients aged over 60. Peripheral vascular disease is common in the general ageing population¹⁶ and sensory neuropathy affects approximately 22% of those over 60.¹⁷

In the present audit, the aetiology was unknown in approximately 25% of the ulcers. As identification of the aetiology is a prerequisite for effective management, this suggests that those assessing, diagnosing and treating foot ulcers required more education on this. Indeed, 53 nurses and six podiatrists (67%) indicated that they needed more information on

Fig 4. Ulcer duration by profession



foot ulcer management on their return form.

The results also indicate that 67% of the ulcers had been present for four months or less, and nearly 25% for over six months. The reason for this is unclear. However, it may be connected to the fact that one quarter had an unknown aetiology, and so could have been considered difficult to manage, resulting in them becoming chronic. It could be argued that any ulcer duration over one month could be considered chronic. Based on these data, 62% of the foot ulcers (n=83) could be labelled as chronic, suggesting they were not being managed appropriately.

Our results suggest there is a need to explore the feasibility of setting up foot ulcer clinics for non-diabetic patients. This could focus on aetiological assessment and the development of management plans for practitioners. It could also provide a central point for education and advice. As with the diabetic foot clinic model, rapid access to diagnostic testing such as radiology and microbiology could help improve both the speed of diagnosis and care.

Study limitations

This audit was conducted over a two-week period and so can only give a rough indication of the true prevalence of non-diabetic foot ulcers.

While the overall response rate was low, a significant number of ulcers was still identified. However, the true number could be much higher than this.

As the investigator did not assess individual patients, it was necessary to rely on the data supplied by the reporting staff on the exclusion of diabetes and the diagnosis of neuropathy and ischaemia. Nevertheless, it was assumed that all of the respondents were competent in assessing the foot ulcer aetiology.

Furthermore, it is possible that undiagnosed cases of diabetes were included in the data pool as haemoglobin A1c/random blood sugars were not sought.

It should be noted that this audit was completed in 2000. However, data published in the literature since then on non-diabetic foot ulcer prevalence is hard to find. During the interim period, wound care for patients with foot ulcers in the health service district has improved following the appointment of two clinical practitioners with expertise in both tissue viability and podiatry, who run a specialist clinic for patients with chronic wounds. This has resulted in faster assessment and diagnosis, and therefore better management.

Conclusion

This audit has presented prevalence data for foot ulcers in what is assumed to be a non-diabetic

cohort. Foot ulcers occurred in around 0.02% of this population but showed a dramatic increase in patients aged over 60 (0.21%), which is consistent with other studies on lower extremity ulceration. Ulcers predominantly affected the digits. The majority were managed in the community. Approximately one-quarter had a duration of six months or more, and the aetiology was unknown in a similar number, suggesting there is a real need for education on assessment and management.

One option is to pilot a specialist foot ulcer clinic, which could run on a similar model to that of a diabetic foot clinic. Benefits might include faster diagnosis, provision of education and, ultimately, better healing times. ■

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