Use of an emergency telephone hotline by people with diabetic foot disease

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Article points

1. Delays in identifying diabetic foot ulcers lead to increased morbidity and higher rates of lower-limb amputation.
2. The emergency diabetes foot hotline offers a rapid link between people with acute diabetic foot problems and a multidisciplinary foot care clinic.
3. A telephone hotline is a useful tool to stratify and expedite the management of acute diabetic foot ulcers, potentially reducing long-term complications.

Key words:
- Telemedicine
- Referral
- Patient communication

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Foot ulcers are a common complication of diabetes, substantially increasing morbidity and healthcare costs. This article reviews the establishment and success of an emergency telephone hotline for rapid assessment and referral of people who have, or who are at high risk of developing, diabetic foot disease. The positive response to this new service among people with diabetes indicates that such hotlines could reduce delays in diagnosis and treatment in acute circumstances, and thereby improve outcomes.

A wide range of diabetic foot ulcer phenotypes are observed in clinical practice, in both community and hospital settings, the severity and management of which will impact on the outcomes. An uncomplicated neuropathic ulcer, for example, can heal within 4 months, if it is optimally treated (Armstrong et al, 2001). However, delays initiating therapeutic measures can lead to impaired and slow healing, infection and, ultimately, amputation (Frykberg et al, 2006). Eighty percent of amputations are preceded by an ulcer (Reiber, 1996) and it is estimated that diabetes is responsible for approximately 40% of lower-limb amputations in the UK (National Amputee Statistical Database, 2006), although there is variation in the geographical distribution (Global Lower Extremity Amputation Study Group, 2000; Canavan et al, 2003). In addition, perioperative, long-term mortality, and the risk of further amputations, are increased in those who require surgical intervention (Moulik and Gill, 2002; Moulik et al, 2003).

Therefore, risk stratification of diabetic ulcers is essential in determining and delivering appropriate care. Different scoring systems are available to establish the level of ulceration risk of a given diabetic foot (Oyibo et al, 2001; Abbas et al, 2008) or, indeed, the risk of deterioration of an existing ulcer. Current guidelines (NICE, 2004) recommend that people with diabetes who discover an ulcer, new swelling or new discoloration of the

Page points

1. This study was conducted to determine the value of a telephone hotline in the assessment and referral of people with active diabetic foot disease, or those at high risk of developing diabetic foot complications.
2. A diabetes specialist podiatrist carried a mobile telephone to which the hotline was linked from Monday to Friday, between 8am and 3pm. The hotline was not manned 24 hours per day, 7 days per week.
3. Callers received either advice over the telephone, had their existing foot clinic appointment expedited or were asked to attend the clinic within the next 24–48 hours for emergency assessment.

foot should be referred to a multidisciplinary foot care team within 24 hours of the change, as clinical deterioration may progress quickly. However, limited surveillance in the community, poor communication between primary and secondary care and a lack of speedy access to an informed opinion can cause delays in treatment of the diabetic foot. The authors' diabetes and foot health departments are centralised referral centres with an estimated 3800 people seen annually. A direct telephone hotline, "the emergency foot line", was launched to facilitate rapid access to diagnosis, treatment and care, potentially improving clinical outcomes for people with acute diabetic foot problems.

Aims

This study was conducted to determine the value of a telephone hotline in the assessment and referral of people with active diabetic foot disease, or those at high risk of developing diabetic foot complications. It aimed to identify the type of person using this new service, to assess the appropriateness of the calls received and to evaluate the management plans devised following an appropriate call to the service.

Methods

This was a 7-week prospective cohort pilot study. The emergency foot line provides advice to people with diabetes who have an acute or deteriorating diabetic foot problem, assists with referrals and allows identification of those that require urgent review (within 24 hours) in the Leeds area. Posters and patient cards containing the hotline contact number, and a list of circumstances under which to call, were distributed locally to inform people who either had active diabetic foot disease, or were at high risk of developing diabetic foot disease, and their healthcare professionals, that the service was available to them. This was achieved through the Leeds Health Pathways, a clinical decision support system with access to both primary and secondary care. In addition, district diabetes nurses arranged education sessions to inform GPs, podiatrists and community nurses of the availability of the hotline.

A diabetes specialist podiatrist carried a mobile telephone to which the hotline was linked from Monday to Friday, between 8am and 3pm. The hotline was not manned 24 hours per day, 7 days per week. Details of each call were collated using a proforma. Calls were considered appropriate if they fulfilled any of the following criteria: a hot, red, swollen or painful foot, with or without a new or deteriorating foot ulcer. According to these criteria, and depending on the description of the complaint, callers received either (i) advice over the telephone, (ii) had their existing foot clinic appointment expedited or (iii) were asked to attend the clinic within the next 24–48 hours for emergency assessment.

A second proforma was completed for people who called the hotline and were seen as emergency cases. A description of their foot problem, and the management plan decided upon, were recorded.

Statistical analysis was performed using SPSS, version 14 (SPSS, Chicago, IL). As most of the data were categorised, they have been expressed as frequencies. Comparison between groups was done using the Chi-squared test. A result was considered statistically significant if the *P* value was less than 0.05.

Results

Demographic and baseline characteristics

A total of 45 calls, from 45 individuals, were received within the 7-week study period. The majority of the callers were male (70%), with a mean age of 63 years (range, 40–83 years). More than half had type 2 diabetes (68%) and the mean duration of their diabetes was 16 years (range, 2–50 years).

A significant number of participants had previous foot problems (82%; $P<0.01$), such as foot ulcers with or without infection and toe amputations, compared with those who had not had a previous foot problem. A total of 67% of the callers were already known to the diabetes and foot health departments, and 47% of them were actively followed up at the foot clinic.

Use of the service

Calls were considered appropriate in 73% of cases (n=33; P<0.01), compared with the 26% of calls that were inappropriate, which included calls regarding confirmation of appointments, questions regarding orthotics and other general queries.

The majority appropriate calls were related to the presence of a new or deteriorating ulcer (39% new ulcers, 18% deteriorating ulcers), while the remaining 42% were regarding a combination of red, hot, swollen or painful feet (*Figure 1a*). Those people who made appropriate contact received an earlier appointment in 24% of cases. The rest were considered emergency cases and were seen in the clinic within 48 hours of their call (70% within 24 hours, 6% within 48 hours).

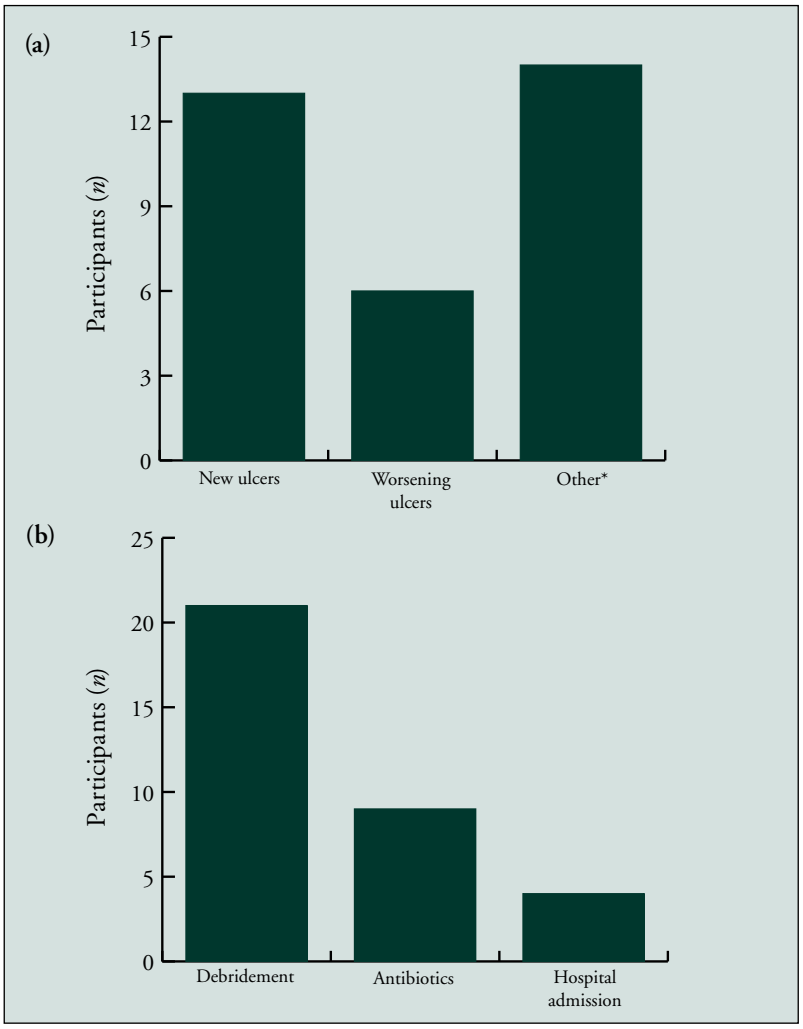

*Figure 1(a). Appropriate calls made to the emergency foot line, broken down by the nature of the problem reported. (b) The management plans for emergency cases made by the multidisciplinary foot care team at the time of review. *The "other" category includes callers who reported red, swollen, hot or painful feet.*

Assessment of emergency cases

Of those seen in the clinic as emergency cases (n=25) following their hotline call, 41% had peripheral vascular disease and 81% had diabetic neuropathy. People seen as emergency cases fulfilled all the criteria (a hot, red, swollen and painful foot, with or without a new or deteriorating foot ulcer) and were then stratified further according to their clinical condition. Treatment plans for these people included debridement, cleaning and dressing of their ulcer (84%) and prescription of antibiotics due to clinical evidence of infection (36%). Sixteen percent were admitted to hospital due to the severity of their ulceration (*Figure 1b*).

Discussion

A variety of specialities have employed telephone hotlines to improve communication between people and their healthcare professionals (Chiari and Vanelli, 2005). Telemedicine is particularly useful in diabetes care because it can provide advice not only to the person with the condition, but also to families and carers who can access the service on behalf of a person unable to make contact. Telephone contact can facilitate insulin dose adjustments, management of acute hypoglycaemic events, counselling at a time of intercurrent illness or in an emergency situation, such as diabetic ketoacidosis (Kapellen et al, 1998; Chiari et al, 2003), during and outside usual working hours (Miller and Goldstein, 1972; Flynn et al, 2005). This study of an emergency diabetic foot telephone hotline showed how establishment of rapid contact between an at-risk individual and a specialist podiatrist for evaluation and prioritisation of new or worsening foot problems can be achieved. This is an intervention that could reduce complications (Plank et al, 2003).

This pilot study of an emergency diabetic foot telephone hotline suggests a positive response to this service among people with diabetes and their families. It has been reported that people with diabetes and their families can detect approximately 61% of new foot ulcers, but that the median time between ulcer onset and first foot clinic referral is 15 days (Macfarlane and Jeffcoate, 1997). At the time of consultation, it is suggested, up to one third of people with diabetic foot ulcers have both a wound infection and peripheral vascular disease (Prompers et al, 2007). Reducing delays in diagnosis and treatment in acute circumstances is, therefore, important if outcomes are to be improved.

Of the calls that were appropriate in this study, 70% of those were seen within 24 hours of their call, in line with current guidelines (NICE, 2004). The rest were assessed either within 48 hours (6%), or had their existing clinic appointment expedited to the next available date. As the hotline is only available on week days, a person who develops an acute foot problem over a weekend would be unable to access specialist emergency services within 24 hours, and may be forced to attend an accident and emergency department.

Given the percentage of people who used the hotline and were already known to our department, it is possible that this cohort was particularly well motivated and receptive to preventative measures – having already sought specialist advice – and so perhaps more likely to seek emergency advice than the general population with diabetes.

Conclusion

This pilot study suggests that emergency diabetic foot telephone hotlines are a useful tool to triage and expedite the management of the acute diabetic foot, facilitating emergency access to secondary care, and therefore potentially effecting a reduction in complications. Further studies should evaluate such a hotline's usefulness over an extended period of time, collecting data from a larger population of people with diabetes and associated foot problems. ■

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