A retrospective audit of footwear use by high-risk individuals in North Derbyshire

Natasha Churchman

Article points

1. Specialist footwear is an essential element of ulcer prevention for people with diabetes who have foot deformity, neuropathy or ischaemia, or previous foot ulceration.
2. A total of 51 completed questionnaires were received and used for data collection and analysis.
3. Clinicians treating high-risk individuals need to have their attention brought to the importance of specialist footwear as an ulcer prevention strategy, and also to the importance of re-evaluating the footwear at every contact point with that individual.

Key words

- Footwear
- Multidisciplinary clinic

Natasha Churchman is Lead Diabetes Podiatrist, Derbyshire County PCT.

Specialist footwear is an essential element of ulcer prevention for people with diabetes who have foot deformity, neuropathy, ischaemia or previous foot ulceration (DoH, 2001). Several studies have recommended the benefits of a multidisciplinary approach to improve patient satisfaction and concordance with wearing specialist footwear (Newson et al, 1992; Knowles and Boulton, 1996; Baker and Leatherdale, 1999). This article reports on the provision of and people's attitudes towards specialist footwear, and if satisfaction and adherence are improved through the use of a multidisciplinary footwear clinic in North Derbyshire.

In the UK, it is estimated that at any one time 6% of people with diabetes will have an active foot ulcer (Jones, 1998). The delayed healing, high probability of amputation and disability due to these ulcers have social and economic costs. Over 85% of major leg amputations initially begin with a foot ulcer (Foster and Edmonds, 2001; Lobmann et al, 2001).

Aims

The aims of this audit were as follows.

- To determine the percentage provision of specialist footwear to high-risk individuals with diabetes.
- To determine the duration of time any specialist footwear is worn.
- To determine the reasons for dissatisfaction with specialist footwear.
- To determine if a multidisciplinary approach increases patient choice regarding their footwear.
- To determine if a multidisciplinary approach reduces problems caused by footwear.

Methodology

All adults with diabetes who had attended a podiatry clinic in North Derbyshire and had had a foot ulcer within the last 2 years comprised the population from which a sample was taken. Due to time and personnel constraints a random sample of the population was given a questionnaire to complete (70/350; see *Appendix 1* for questionnaire). The questionnaire was based upon those currently published in the field of specialist footwear concerning concordance, choices given and patient opinion, and was aimed to gather this information for the North Derbyshire population (the questionnaire was based on

those published by: Chantelau and Haage, 1994; Baker and Leatherdale, 1999; Philip, 2000; Williams and Meacher, 2001; Van de Weg, 2002).

Data analysis

Data from the returned questionnaires were analysed using a combination of descriptive statistics, chi-squared testing and Fisher's tests.

Results

Questionnaire overview

Fifty-one completed questionnaires were received and used for data collection and analysis. There was no statistically significant difference between the ages of those who received specialist footwear and those who did not. A total of 20 individuals had had specialist footwear provided to them – ten of whom had one pair of specialist footwear, and the remainder had 2 or 3 pairs. Footwear was mainly supplied by three hospitals within North Derbyshire, although one individual had bought her own footwear from the US as she did not like the choice available in the UK. Two people had been prescribed specialist footwear from other hospitals prior to moving into the area.

Where specialist footwear is worn

Two individuals never wore their specialist footwear; seven only wore their footwear outdoors; and 11 individuals wore their footwear both indoors and outdoors.

How long footwear is worn for

Of the individuals with specialist footwear, 17 (85 %) wore it for 5–6 days a week, 10 wore it for 5–6 hours per day and 10 for 3–4 hours a day. Two individuals never wore their footwear, 18 wore footwear outside, and 11 continued to wear it in the home. Chi-square testing

Page points

1. All individuals who had their footwear provided from the hospitals outside the area and from the Dales multidisciplinary clinic were given choices over style, colour, fastening and material.
2. No problems were caused by any footwear supplied from the Dales multidisciplinary clinic or the High Peak orthotist clinic
3. In some parts of North and South Derbyshire podiatrists have to make an initial referral to a GP or diabetologist – it is then at their discretion as to whether an individual is referred or not, even if the podiatrist has recommended the appropriateness of specialist footwear for the individual.

determined that sex did not affect the amount of days per week or the number of hours per day that the footwear is worn.

Reasons for dissatisfaction with footwear

Fifteen individuals with specialist footwear had no problems with their footwear at all. The remaining five (all females) cited the following reasons for being dissatisfied and all were dissatisfied with fitting.

- Footwear was unsuitable for their activities.
- Footwear was uncomfortable.
- Footwear was too heavy.
- Footwear was too large and difficult to put on.

Choice regarding footwear

All individuals who had their footwear provided from the hospitals outside the area and from the Dales multidisciplinary clinic were given choices over style, colour, fastening and material. Individuals who received footwear from both the High Peak and Chesterfield orthotist clinics were given no choices.

Problems caused by specialist footwear

No problems were caused by any footwear supplied from the Dales multidisciplinary clinic or the High Peak orthotist clinic. Concerning footwear from the Chesterfield orthotist clinic, one respondent had foot ulceration, one had a blister, and one had a blister and an ulcer.

Discussion

Although the author was surprised that the provision of footwear to high-risk individuals was only 39 %, it is comparable to that of Neil (2002). Neil's study indicated that 35% of individuals with peripheral neuropathy and diabetes were supplied with specialist footwear. There may be several reasons for this low number. Firstly, depending on local protocol, not all podiatrists can directly refer to an orthotist for specialist footwear to be provided. For example, in some parts of North and South Derbyshire podiatrists have to make an initial referral to a GP or diabetologist – it is then at their discretion as to whether an individual is referred or not, even if the podiatrist has recommended the appropriateness of specialist footwear for the individual. Secondly, time may also be an issue, but should not be an excuse.

Footwear provision

The results of this study are similar to those of Baker and Leatherdale (1999), who found that 83.5% always wore their footwear.

Footwear concordance

In this audit 35% wore their specialist footwear for greater than 9 hours per day, and would be considered to be concordant by Chantelau and Haage's (1994) standards: footwear worn for approximately 9.6 hours per day. The author believes that this highlights that further education should be provided to individuals to remind them that they should continue to wear this footwear indoors as well as outdoors. Also, additional choices of footwear suitable for in the home should be considered to raise the adherence rate further for individuals who are essentially housebound.

The concordance rates also compare favourably to previous studies: Knowles and Boulton (1996) found that only 22% of people regularly wore their specialist footwear and McCabe et al (1998) found that only 36% of patients claimed to wear specialist footwear at all times, and 27% never wore it. However, none of the above studies assessed the duration that specialist footwear was worn for, rather they assessed wear times through a more general basis with individuals stating whether they wore footwear regularly, sometimes or not at all. Each individual will have a different perception of what regularly wearing footwear means. Some individuals may term this as every day, others could interpret it as three times a week, therefore it is difficult to compare the results of this study to previous ones. Only a study by Armstrong (2001) looked at where footwear was worn, and Chantelau and Haage (1994) addressed the duration specialist footwear was worn.

The results of this study are comparable to

Page points

1. Concordance with wearing specialist footwear varies; younger individuals appear to wear the footwear for more days a week, however a larger study is needed to confirm this.
2. The causes of dissatisfaction with footwear in this audit were similar to those given by patients in previous studies.
3. Questionnaire responses show that a multidisciplinary approach to supplying and fitting specialist footwear improves the patient's choice.
4. The footwear supplied from the multidisciplinary clinic also caused no problems when wearing, whereas five individuals supplied from a 'traditional' footwear clinic had problems with blistering, ulceration or both.

previous studies which investigated where patients wore footwear. Armstrong's study (2001) found that 85% of a population of high-risk individuals wore footwear outdoors; with only 15% continuing to wear this inside the home.

Concordance with wearing specialist footwear varies; younger individuals appear to wear the footwear for more days a week, however a larger study is needed to confirm this. This could reflect the change in activity levels for people post-retirement. Additional ranges of specialist footwear may be useful so that individuals will have specialist footwear suitable to their activities.

Footwear dissatisfaction

The causes of dissatisfaction with footwear in this audit were similar to those given by patients in previous studies (Fisher and McLellan, 1989; Lord and Foulston, 1989). One in twenty found their specialist footwear unsuitable for activities, uncomfortable, too heavy, too large or did not fit properly.

Concerning appearance of the footwear all men found this to be acceptable; three of the ten women with specialist footwear did not like the appearance of the footwear provided, resulting in two of them not wearing footwear. The author believes that this is due to women's focus upon wearing more fashionable footwear.

Sadly the appearance of women's footwear is falling short of expectations. On questioning regarding the acceptability of appearance in this study, 30% of women found the appearance unacceptable. This is comparable to results in a study undertaken by Bas van de Weg (2002) who found cosmetic dissatisfaction was indicated by 40% of people with diabetes. Also in Knowles and Boulton's 1996 study the female participants were less satisfied with the appearance of the footwear provided than male subjects. This highlights the need for a screening process prior to individuals attending a footwear clinic, so that people can see the type of footwear which is available to them. Pre-screening has been shown to be valuable by Williams and Meacher (2001) who found that those who had an awareness of the type of footwear they were likely to receive from the footwear clinic were more accepting of it.

Questionnaire responses show that a multidisciplinary approach to supplying and fitting specialist footwear improves the patient's choice. Previous studies have indicated that people with diabetes wish to have more control over the shoes that they are being supplied with (Fisher, 1989; Newson et al, 1992). Newson et al's study indicated that a multidisciplinary approach involving the person with diabetes would not only increase the patient's choice, but also satisfaction and concordance.

Williams and Meacher (2001) compared patient choice with footwear supplied from either a multidisciplinary or a 'traditional' footwear clinic. Only 70 % in the traditional clinic were offered choices regarding the style and colour of their footwear, compared to 100 % in the multidisciplinary clinic.

The footwear supplied from the multidisciplinary clinic also caused no problems when wearing, whereas five individuals supplied from a 'traditional' footwear clinic had problems with blistering, ulceration or both. One individual developed ulceration, one a blister and one a blister and ulceration; in total 15 % of the population with specialist footwear. These findings are similar to those of previous studies. Fisher found that the footwear had rubbed sores or ulcers in 7 out of the 39 individuals.

Limitations

Data pertaining to when the trauma occurred to the feet was not gathered from participants in this study, thus, the author is unable to determine whether problems were caused due to ill-fitting footwear or from another mechanism. This will, however, be included in further audits.

If problems had arisen within the first month after the specialist footwear was fitted this could indicate that the footwear did not accommodate the patient's foot properly (Baker and Leatherdale, 1999). Problems arising months later could indicate that new footwear was required or existing footwear would need

Page points

1. The fact that problems do occur emphasises the importance of professional and patient scrutiny of specialist footwear.
2. One of the advantages of the multidisciplinary footwear clinic is that the podiatrist is also involved with the routine care of high-risk individuals with diabetes.
3. Clinicians treating high-risk individuals need to have their attention brought to the importance of specialist footwear as an ulcer prevention strategy.

repair (Lord and Lewis, 1998).

The fact that problems do occur emphasises the importance of professional and patient scrutiny of specialist footwear. Previously, the importance of early review of footwear after dispensation to reduce the risk of problems caused by ill-fitting has been recognised (Chantelau et al, 1990). Education is essential to enable people with diabetes to confidently recognise warning signs upon their feet, and know who to contact if problems arise.

One of the advantages of the multidisciplinary footwear clinic is that the podiatrist is also involved with the routine care of high-risk individuals with diabetes; therefore as the clinician has an extended knowledge base in footwear and high-risk patient management, potential problems can be avoided as more frequent checks are made.

Conclusion

Only 39% of respondents did have specialist footwear. Although this compares favourably with previous studies which benchmarked current provision of specialist footwear, it is not acceptable.

The benefits of a multidisciplinary clinic are indicated by this audit. Individuals who had their footwear provided by a multidisciplinary clinic were given greater input into the decision-making process regarding their footwear, and the footwear supplied to the individuals who had completed the questionnaire caused no problems. These results may be attributed to more in-depth scrutiny of the footwear and emphasis of education by the multidisciplinary clinic at the time of fitting, dispensing and at subsequent follow up.

Clinicians treating high-risk individuals need to have their attention brought to the importance of specialist footwear as an ulcer prevention strategy, and also to the importance of re-evaluating the footwear at every contact point with that individual. ■

Armstrong DG, Abu-Rumman PL, Nixon BP, Boulton AJ (2001) Continuous activity monitoring in persons at high risk for diabetes-related lower-extremity amputation. *Journal of the American Podiatric Medical Association* **91**: 451–5

Baker N, Leatherdale B (1999) Audit of special shoes: are they being worn? *The Diabetic Foot* **2**: 100–4

Chantelau E, Haage P (1994) An audit of cushioned diabetic footwear: relation to patient compliance. *Diabetic Medicine* **11**: 114–6

Chantelau E, Kushner T, Spraul M (1990) How effective is cushioned therapeutic footwear in protecting diabetic feet? A clinical study. *Diabetic Medicine* **7**: 355–9

DoH (2001) *National Service Framework for Diabetes: Standards*. DoH, London

Fisher LR, McLellan DL (1989) Questionnaire assessment of patient satisfaction with lower limb orthoses from a district hospital. *Prosthetics and Orthotics International* **13**: 29–35

Foster A, Edmonds M (2001) An overview of foot disease in patients with diabetes. *Nursing Standard* **16**: 45–52

Jones V (1998) Selecting a dressing for the diabetic foot: factors to consider. *The Diabetic Foot* **1**: 48–52

Knowles EA, Boulton AJ (1996) Do people with diabetes wear their prescribed footwear? *Diabetic Medicine* **13**: 1064–8

Lobmann R, Kayser R, Kasten G et al (2001) Effects of preventative footwear on foot pressure as determined by pedobarography in diabetic patients: a prospective study. *Diabetic Medicine* **18**: 314–9

Lord M, Foulston J (1989) Surgical footwear: a survey of prescribing consultants. *BMJ* **299**: 657

Lord M, Lewis R (1998) An overview of footwear provision for the diabetic foot. *The Diabetic Foot* **1**: 64–71

McCabe CJ, Stevenson RC, Dolan AM (1998) Evaluation of a diabetic foot screening and protection programme. *Diabetic Medicine* **15**: 80–4

Neil JA (2002) Footwear practices of people with and without diabetic foot ulcers. *The Diabetic Foot* 5: 140–50

Newson F, Robinson N, Smith S (1992) Specialist footwear: a quality initiative to find out what patients think. *Physiotherapy* **78**: 12–14

NICE (2004) *Type 2 Diabetes: Prevention and management of foot problems.* NICE, London

Philip J (2000). Women and their shoes: attitudes, influences and behaviour. *British Journal of Podiatry* **3**: 111–5

Pinzur MS, Shields NN, Goelitz B et al (1999) American Orthopaedic Foot and Ankle Society shoe survey of diabetic patients. *Foot & Ankle International* **20**: 703–7

Van de Weg B (2002) Compliance with specialist footwear in patients with diabetes. *The Diabetic Foot* **1**: 32–6

Williams A, Meacher K (2001) Shoes in the cupboard: the fate of prescribed footwear? *Prosthetics and Orthotics International* **25**: 53–9

1. Do you ever go barefoot?
❒ Always
❒ Most of the time
❒ Sometimes
❒ Never

2. Where do you go barefoot?
❒ Indoors and outdoors
❒ Everywhere indoors
❒ Bedroom and bathroom
❒ Bedroom only
❒ Bathroom only
❒ Other (please state) ……

3. What type of footwear do you wear?
❒ Slipper ❒ Specialist/surgical
❒ Sandal ❒ Slip-on
❒ Trainer ❒ Court shoe
❒ Lace-up ❒ High heel
❒ Boot ❒ Other (please state)……

4. How many days / part of a day a week is the footwear worn on?

	Never	1–2	3–4	5–6	7 days
Slipper	❒	❒	❒	❒	❒
Sandal	❒	❒	❒	❒	❒
Trainer	❒	❒	❒	❒	❒
Lace-up	❒	❒	❒	❒	❒
Boot	❒	❒	❒	❒	❒
Specialist	❒	❒	❒	❒	❒
Slip-on	❒	❒	❒	❒	❒
Court shoe	❒	❒	❒	❒	❒
High heel	❒	❒	❒	❒	❒
Other	❒	❒	❒	❒	❒

5. How many hours a day is the footwear worn for?

	0–2	3–4	5–6	7–8	9+
Slipper	❒	❒	❒	❒	❒
Sandal	❒	❒	❒	❒	❒
Trainer	❒	❒	❒	❒	❒
Lace-up	❒	❒	❒	❒	❒
Boot	❒	❒	❒	❒	❒
Specialist	❒	❒	❒	❒	❒
Slip-on	❒	❒	❒	❒	❒
Court shoe	❒	❒	❒	❒	❒
High heel	❒	❒	❒	❒	❒
Other	❒	❒	❒	❒	❒

6. Do you have specialist footwear?
❒ Yes ❒ No (go to question 14)

7. How many pairs do you currently wear?
❒ 1 ❒ 2–3 ❒ 4–5 ❒ 6 +

8. Where were they supplied from?
❒ Cavendish Hospital, Buxton
❒ Newholme Hospital, Bakewell
❒ Royal Hospital Calow, Chesterfield
❒ Other (please state) ……

9. What choices were you given for your specialist footwear?
❒ Style ❒ Colour ❒ Material ❒ Fastening
❒ No choice given

10. When do you wear your specialist footwear?
❒ Never ❒ Outdoors
❒ Indoors ❒ Indoors and outdoors

11. If you do not wear your specialist footwear all the time please indicate why
❒ Too large ❒ Too small ❒ Difficult to put on
❒ Too heavy ❒ Uncomfortable ❒ Unsuitable for activities
❒ Increased pain ❒ Do not fit ❒ Other ……

12. Has the footwear ever caused problems for your feet?
❒ Yes
❒ No
❒ Not worn long enough to cause problems

If Yes, please select a choice from below:
❒ Blister ❒ Ulceration
❒ Hard Skin ❒ Other (please state)……

13. Has the appearance of your specialist footwear ever been a reason for not wearing it?
❒ Never
❒ Once
❒ More than once
❒ All the time

Please indicate whether you agree or disagree with the following statements	Agree	Disagree
14. Shoes are an important part of my appearance.	❒	❒
15. I would wear uncomfortable shoes if they looked good.	❒	❒
16. I would wear an unattractive style if it improved my foot health.	❒	❒
17. Comfort is more important than appearance.	❒	❒
18. The appearance of my specialist footwear is acceptable.	❒	❒

19. What sex are you?
❒ Male ❒ Female

What is your age?
❒ 18–30
❒ 31–44
❒ 45–64
❒ 65+

Appendix 1. The questionnaire sent to the 70 individuals randomly selected from the clinic population (n=350).