The rise and fall of foot screening

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I didn't get where I am today without working for one of the original pioneers of research into the origins of diabetic foot disease. During my time with Professor Andrew Boulton at Manchester Royal Infirmary, our department produced many of the seminal works on risk factors for foot ulceration. My research lead to what is now over 25 years of interest in diabetes foot care and, after the launch of this journal 20 years ago, to a variety of roles and ultimately to becoming Editor-in-Chief. But will monofilaments and pulses go the same way as foot pressures and diabetic socks?

What are the risk factors for foot ulceration?

Diabetes foot ulceration is a common problem. The Scottish Diabetes Survey (2015) records that around 5% of the diabetes population in Scotland have or have had a foot ulcer. The first studies to associate neuropathy with ulceration in diabetes were published in the mid 1980s, but it was one of my own in 1994 that first demonstrated that reduced sensation could predict those patients at increased risk of ulceration (Young et al, 1994). But herein lies one the first problems with screening for risk factors for foot ulceration; even the best screening tests only predict a fivefold increase in risk of ulceration and only 5% of the increased risk group will ulcerate each year. This means there are 95% of the at-risk population who will remain ulcer-free. But at least we can rule out those with a less than 0.2% chance of ulcerating by demonstrating intact sensation and pulses (Leese et al, 2006).

So, are there other factors which can explain this lack of selectivity? Diabetes control seems a reasonable candidate, but actually has little impact. Renal impairment is a strong associative factor and recently highlighted in the new Scottish traffic light system, but in truth, the evidence is mainly for those with end-stage renal failure. Men are twice as likely to develop an ulcer than women and the average age of foot ulceration is in the mid 60s. Despite making up only 8% of patients around 20% of foot ulcer patients are type 1. These days ischaemia makes up around 60% of patients, but in the late 80s and early 90s it was around 30%. This is due in part to the rise of type 2 diabetes over the past 30 years. There are three times as many people with diabetes now than when the journal began 20 years ago and the majority of this is due to the rise in type 2 diabetes.

Recently, Fay Crawford (2015) led a team that re-analysed 16 of the large original risk factor studies with a total of 16,000 patients. The study confirmed that a person's inability to feel a 10-g monofilament increased foot ulcer risk by a factor of three. At least one absent pedal pulse doubled the risk. Men were nearly one and half times more likely to ulcerate than women, but having a previous ulcer increased the risk by sevenfold. This essentially confirms the current screening modalities and accepted risk factors as being the best ones to determine which patients are at increased risk of ulceration, but what can we do to prevent ulceration?

Can we prevent ulceration?

When *The Diabetic Foot Journal* was first launched, foot screening was not organised or structured and the outcomes were not acted upon. This has recently changed. There are management strategies attached to the Scottish traffic light system and adopted as part of the Putting Feet First campaign (Diabetes UK, 2009). With the aid of Quality and Outcomes Framework (QOF) stressing the importance of classifying foot ulceration risk level, screening and classification rates among the diabetes population hit 85% plus. With the end of QOF in Scotland last year and this year in England, these rates are already starting to slide, however. Should we be worried about this event? Possibly, but the truth remains that despite all of our efforts, ulceration prevalence rates are barely shifting. The same is true of re-ulceration. First ulceration is still the biggest single risk factor for future ulceration. Recurrence of ulceration approaches 50% within one year of healing in most series, despite shoes, insoles and preventative care (Maciejewski et al, 2004).

Is screening useful?

Screening for the absence of factors that increase risk of foot ulceration is able to identify a low risk population that can safely be allowed to self manage with a negligible risk of ulceration in the next year (Leese et al, 2006). Those with risk factors should be placed into preventative podiatric care programmes, not because we can prevent ulceration, but because seeing a podiatrist and accessing multidisciplinary care quickly is the best way to reduce the risk of amputation (Gibson et al, 2014). These two facts alone make screening worthwhile for patients as individuals and for the wider NHS. ■

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