

# The diabetic foot: a 20-year history



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It is hard to believe that it is more than 20 years ago that I joined a number of friends and colleagues in London for the first editorial board meeting of the *The Diabetic Foot Journal*. There is no doubt that much progress has been made in the past two decades in both research and clinical practice in this area: however, there are also areas of ‘stagnation’, requiring rigorous clinical research to answer what have so far been rhetorical questions.

Most would agree that the diabetic foot can no longer be regarded as the ‘Cinderella’ of diabetic complications. Evidence to support this statement comes from many sources, including the fact that publications on this topic have increased (expressed as a proportion of all diabetes publications) from 0.7% in 1977-88 to 6.5% in 2007-2010, as listed on Medline. There can be little doubt that focused specialist journals, such as *The Diabetic Foot Journal*, have contributed to this. This journal has fostered the need for a team approach — emphasising the multiple specialties in medicine and surgery that contribute to diabetic foot care. The journal has rightly promoted the importance of allied healthcare professionals, especially podiatry and diabetic specialist nursing. Surely, of all those who care for the diabetic foot, these two specialties are of paramount importance.

In parallel to this, the formation of many study groups and societies focusing on the diabetic foot has blossomed. Examples would include the Diabetic Foot Study Group of the European Association for the Study of Diabetes (founded in 1998) and the ongoing and very successful ‘Step by Step’ educational programme pioneered by the International Working Group on the Diabetic Foot (IWGDF).

## Areas of progress

Prospective studies over the past two decades have helped us clearly understand the pathways that result in diabetic foot ulceration (DFU). Much

progress has also been made in the screening of diabetic patients with emphasis on the annual review where evidence of all complications of diabetes should be sought. There is now a good evidence base to support the use of the 10g monofilament, which has for many years been the gold standard of screening for reduced sensation in the diabetic foot. More recently, other simpler tests include the Ipswich Touch Test (pioneered by Gerry Rayman and colleagues) (Rayman et al, 2011) and the Vibratip™ (McCallan Medical), a simple hand-held battery operated vibration test. Societies such as the American Diabetes Association have published their advice as to what should be in the Comprehensive Diabetic Foot Exam (Boulton et al, 2008).

However, it is often forgotten that the most important factor in the screening of the diabetic foot is to remove the shoes and socks, and examine the feet carefully. Many high-risk diabetic feet can be identified in this way and the simple test confirms one’s clinical suspicions. Indeed, it was Dr Paul Brand, famous for his work in leprosy and later diabetes, firstly in India and later in the United States, who stated: “You do not need expensive equipment to identify the high-risk foot.” Indeed, the renowned 19th century Irish physician, Dominic Corrigan stated: “The trouble with most doctors is not that they don’t know enough — but they do not see enough”. This is certainly true for the diabetic foot and, many years ago, Brand was lecturing to an American audience when he was asked what the most important steps would be to reduce amputations in diabetes. No doubt the audience was expecting some complex radiological or other scanning test but his answer was very simple: “Every time you see a patient with diabetes, remove the shoes and socks and examine the feet.”

This remains true today. I remember lecturing some 14 years ago at the New Zealand Diabetes Association annual meeting in Dunedin and

there was a report on how progress was being made in primary care in the screening for diabetic complications. A very high percentage of patients across New Zealand were being screened for microalbuminuria, retinopathy, blood pressure and cholesterol, but the figures were disappointing for diabetic foot care. I recall one GP in his comments at the foot of the form stating: "I know how important diabetic complications are, but I simply cannot become enthused by feet!" I know that all the readers of this journal will be appalled to learn of this comment and I trust that some 14 years later, that this view is no longer prevalent.

In the area of treatment, much progress has been made in a number of modalities. The need to cast plantar neuropathic foot ulcers is well-recognised and supported by randomised controlled trials (RCTs). A systematic review published a few years ago confirmed the efficacy of offloading whether this was by total contact cast or a removable cast walker rendered irremovable (Bus et al, 2016). Other progress in treatments include the use of negative pressure wound therapy with two RCTs supporting the efficacy of this modality when used appropriately in complex or postoperative diabetic foot wounds. Both of these studies have received some criticism, but there is more evidence for this treatment than most others used in the diabetic foot. Another area is the use of antibiotics in localised osteomyelitis in the diabetic foot. A small RCT from Spain did confirm that antibiotics alone appeared to be equal to localised surgery in the management of this condition (Lázaro-Martínez et al, 2014).

### Areas in need of further study

Although we all inherently believe that foot care education should reduce the incidence of both first and recurrent foot ulcers, sadly there is little to support this belief from the literature with respect to RCTs. A systematic review from the Netherlands on primary prevention of foot ulcers by patient education concluded that there was insufficient robust evidence to support education alone in the reduction in the incidence of ulcers. However, the authors rightly stated that this should be interpreted as lack of evidence, not evidence of no effect (Dorresteijn and Valk, 2012). There is little chance that concrete proof of education in the prevention of

first diabetic foot ulcers will ever be provided, but this does not affect our current clinical approach to patients with 'at-risk' feet, which is that they should all receive foot care education and, of course, regular podiatry.

With respect to recurrent foot ulcers, our colleagues from Nottingham in an RCT of education in secondary ulcer prevention again could not demonstrate an influence of education alone in ulcer or amputation incidence (Lincoln et al, 2008). It is likely that patients with a history of foot ulcers have predominant physical factors that contribute to re-ulceration and, therefore, education alone may not be sufficient. Support for this theory comes from the studies of Lavery and colleagues who demonstrated that if patients with a history of foot ulcers did regular self-foot temperature monitoring (education plus an intervention) and rested or reported to their podiatrist if there was a difference in temperature that was maintained between the two feet, there was a large reduction in secondary ulcer recurrence (Lavery et al, 2007). It may well be that ongoing studies of 'smart technologies' may help predict feet in the pre-ulcerative stage and may well be successful.

Another area in need of more study is the use of dressings. As Paul Brand stated: "Dressings deceive both the doctor and the patient into thinking that by covering a wound, they were healing it." He was quite correct. Dressings keep a wound clean and may help to promote healing only if permitted to do so in the right environment. Sadly, there is a complete lack of evidence to support the use of any particular dressings in diabetic foot wounds (Game and Jeffcoate, 2016). A similar conclusion can be arrived at with regard to topical and biological treatments, where the evidence is generally weak.

In conclusion, much progress has been made over the past 20 years, however, although many studies have been performed, there is sadly an excess of poorly designed studies with insufficient numbers to answer the question posed (Jeffcoate et al, 2016). The reader is directed to the most helpful report by Jeffcoate and colleagues (Jeffcoate et al, 2016), which outlines the details required and the planning and, indeed, the reporting of studies of interventions in diabetic foot disease. Having said this, it may be that we need to change the way we approach patients with healed ulcers. Recurrence

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rates are high — indeed, higher than many forms of cancer and, therefore, to tell the patient that their ulcer has healed may be falsely reassuring. It has, therefore, been suggested that patients with healed ulcers should be referred to as being in ‘remission’ which might heighten the patients’ understanding that recurrence may well occur if they do not follow advice on regular foot care, appropriate footwear and so on (Bus et al, 2017).

It is hoped that over the next 20 years, *The Diabetic Foot Journal* will continue to be at the forefront of pushing for a better understanding and better research studies to help us answer the many unanswered questions that exist relating to the treatment and prevention of diabetic foot disease. ■

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## Writing for *The Diabetic Foot Journal*

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