A tide of change?

Neil Baker
Consultant Podiatrist, Muzaini Vascular And Diabetic Foot Clinic, Global Medical, Kuwait

The focus of this commentary is a paper by Engberg at al (2019) from Denmark, examining the incidence characteristics of recurrent or new ulcers in a cohort of healed diabetic foot ulcers. This is a retrospective study that included 780 patients followed up for a mean duration of 1.04 years between 2010–2016. For the purpose of this study, a recurrent ulcer was defined as one occurring at the same ulcer site/location and a new ulcer as one at a different location. An ulcer was deemed healed once completely epithelialised and remained intact for two consecutive clinic visits. The length between clinic visits for healed ulcers was 1–3 months. Ulcers were classified as either neuropathic (N), neuro-ischaemic (N/I) or critically ischaemic (CI). This was defined as: N: foot pulses present and vibration threshold ≥25; N/I: toe pressure 40–70 mmHg and/or ankle brachial index <9.0, but an ankle pressure >75 mmHg and vibration threshold ≥25 V; and CI: toe pressure <40 mmHg and/or ankle pressure <75 mmHg. Other baseline and follow-up data collected included age, sex, diabetes duration, control (HbA_{1c}) and type (1 or 2), cigarette smoking, body mass index, blood pressure (mmHg), renal function and physical activity.

This study showed that a third (33.1%) developed a recurrent/other new diabetic foot ulcer per year but, interestingly, 77% of these were new ulcers not ulcer relapses. Healed ulcers strangely predominately occurred the toes (60%) with only 15% occurring on the plantar surface irrespective of N, N/I or CI. The sites for new or relapse ulcers was not given but occurred more commonly in males, type 2 diabetes and smokers. Patients with N/I or CI diabetic foot ulcers were statistically more likely to ulcerate than those with neuropathy.

The paper sheds no light upon prevention strategies employed so it is difficult to comment upon confounding variables. It may be possible that any neuropathic relapse ulcers may have occurred and healed in the 1–3 month follow up visits. This is not a groundbreaking study and there are some obvious flaws and unanswered questions, but it raises some important issues. Over the past 20+ years, the main focus of diabetic foot management has been on treating and preventing neuropathic foot ulcers. Neuropathy has been highlighted as the pivotal cause for foot ulceration and this has led to significant advances in foot ulcer management and research. Due to better care, improved services and improved longevity, neuropathic lesions are perhaps less frequent, whereas N/I are becoming more common. The tide is turning fast and we need to perhaps take a new look at our ulcer prevention care. I am not sure that this study is truly reflective of the norm, but we should take note nonetheless. ■

Engberg S, Kirketerp-Møller K, Anderson HU, Rasmussen A (2019) Incidence and predictors of recurrent and other new diabetic foot ulcers: a retrospective cohort study. *Diabet Med* doi: 10.1111/dme.13964. [Epub ahead of print]

Curr Vasc Pharmacol

Advances in dermoepidermal skin substitutes for diabetic foot ulcers.

Readability	✓✓✓
Applicability to practice	✓✓✓✓
WOW! Factor	✓✓✓

1 As is well known, diabetic foot ulcers (DFUs) are one of the main complications of diabetes and is a leading cause of hospitalisation and non-traumatic lower-limb amputations. In terms of the key facets of standard care of DFUs, these are multidisciplinary management, patient education, glucose control, offloading, debridement, infection control, and adequate perfusion.

2 Dermoepidermal skin substitutes (DSS) have been employed in recent times as a new therapeutic adjunct for treating DFUs. The authors undertook a review underscoring the recent advances in DSS for DFU treatment. They searched the PubMed and Cochrane databases between May and July 2018 for any systematic reviews published after 2013, as well as randomised controlled trials (RCTs).

3 As a result, a total of 28 RCTs were retrospectively evaluated and complete wound closure rates and time to healing were examined for 17 commonly available DSS. In all of the 28 RCTs, healing rates after 12 weeks and the time taken to complete closure in DFUs were heterogeneous.

4 The authors found that the best healing rates at 12 weeks were accomplished with dermal cellular substitutes (Epifix®, 100% and Amnioband®, 85%), as well as with dermal acellular substitutes (Allopatch®, 80% and Hyalograft®, 78.8%). It was concluded that DSS used in conjunction with standard care improved healing rates of DFUs, compared with standard care alone.

Álvaro-Afonso FJ, García-Álvarez Y, Lázaro-Martínez JL et al (2019) Advances in dermoepidermal skin substitutes for diabetic foot ulcers. *Curr Vasc Pharmacol* doi: 10.2174/1570161117666190408170144. [Epub ahead of print]

Am J Hypertens

Hypertension contributes to neuropathy in patients with type 1 diabetes

Readability	✓✓✓
Applicability to practice	✓✓✓
WOW! Factor	✓✓✓

1 Foot ulceration and amputation are both potential offshoots of diabetic peripheral neuropathy (DPN). This study set out to determine whether or not hypertension contributes to DPN in patients with type one diabetes.

2 A comprehensive assessment of DPN was undertaken by the researchers in 70 subjects with type one diabetes and 78 controls. Whereas hypertension was found to be present in 40 of the 70 subjects with type one diabetes, it was discovered in 20 of 78 controls.

3 The authors associated hypertension in the people with type one diabetes with abnormal nerve conduction parameters (P=0.03-<0.001), increased vibration perception threshold (P=0.01) and decreased corneal nerve fibre density and length (P=0.02). Once the findings were adjusted for confounding factors, tibial compound motor action potential and nerve conduction velocity were the only factors associated with hypertension (P=0.03) and systolic blood pressure (P<0.01-<0.0001).

4 The authors concluded that hypertension is associated with impaired nerve conduction in individuals with type one diabetes. The study supports previous small trials that showed ACE inhibitors improving nerve conduction.

Ponirakis G, Petropoulos IN, Alam U et al (2019) Hypertension contributes to neuropathy in patients with type 1 diabetes. *Am J Hypertens* doi: 10.1093/ajh/hpz058. [Epub ahead of print]

Diabet Med

The cost of diabetic foot ulcers and amputations to the National Health Service in England

Readability	✓✓✓
Applicability to practice	✓✓✓
WOW! Factor	✓✓✓

1 The authors determined to estimate the healthcare costs that are associated with diabetic foot disease in England. A mixture of patient-level data sets at both national and local level, as well as evidence from clinical studies, were used to estimate the annual health care cost of foot ulceration and amputation in people with diabetes in England between 2014 and 2015.

2 During this time, health care costs for ulceration and amputation in diabetes are estimated to have amounted to between £837m and £962m, which represents between 0.8% to 0.9% of the National Health Service (NHS) budget for England.

3 Ninety percent of expenditure was linked to ulceration, while 60% was related to care in the community, outpatient and primary settings. Ulceration for inpatients was associated with a length of stay that was 8.04 days longer (95% confidence intervals 7.65 to 8.42) than that for patients with diabetes without ulceration.

4 Were the NHS to decrease prevalence of diabetic foot ulcers by a third, the authors relayed that gross annual savings to the organisation would be more than £250m.

Kerr M, Barron E, Chadwick P et al (2019) The cost of diabetic foot ulcers and amputations to the National Health Service in England. *Diabet Med* doi: 10.1111/dme.13973. [Epub ahead of print]

Open Heart

Empowering podiatrists to perform pulse checks for opportunistic atrial fibrillation detection during annual diabetes foot checks

Readability	✓✓✓
Applicability to practice	✓✓✓✓
WOW! Factor	✓✓✓

1 The authors set out to establish if training podiatrists to offer screening for atrial fibrillation (AF) during the local diabetes foot check was a realistic scenario and determine whether or not it detects previously unknown AF.

2 A total of 45 podiatrists from across the North Durham, Darlington and Durham Dales Easington and Sedgefield Clinical Commissioning Groups in the north east of England were given training to distinguish heart irregularities when checking feet pulse readings in patients with diabetes during their annual foot screening reviews.

3 Five thousand patients with diabetes had their feet pulses checked by the podiatrists over a 3-month period and it was found that for every 500 patients checked, one new case of AF could be identified.

4 The NHS in the north east and north Cumbia could see savings of more than £500,000 by routinely screening for AF, the study proposed.In 2013, the National Diabetes Information Service, Yorkshire and Humber Public Health Observatory estimated that there was a total of 231 777 people in the North East, North Cumbria, Hambleton and Richmondshire areas with diabetes. With an estimated 463 of these potentially having AF, it was extrapolated that 23 strokes could be prevented, thus saving £539,742.

Hicks K, Newton J, Nayar R, Mackay K (2019) Empowering podiatrists to perform pulse checks for opportunistic atrial fibrillation detection during annual diabetes foot checks. *Open Heart* 6(1): e000795

> ***"Neuropathy has been highlighted as the pivotal cause for foot ulceration and this has led to significant advances in foot ulcer management and research."***