Lower limb complications

Staying alive: Targeting CV risk factors in people with diabetic foot ulcers

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I make no apologies for using one of my own papers as the basis of this commentary. The importance of secondary cardiovascular (CV) risk reduction and, in some cases, all-cause mortality reduction following myocardial infarction and stroke is widely accepted. Primary prevention remains a muddled area in diabetes management, but statins, anti-platelet agents, angiotensin-converting enzyme (ACE) inhibitors and beta-blockers are all recommended following a CV event. Smoking cessation is almost certainly equally as important, but, unlike all the drug therapies, does not have big trials sponsored by tobacco companies to support it.

The high mortality associated with diabetic foot ulceration or amputation is also well known, and frequently reported. However, despite the fact that foot ulceration is likely to represent significant vascular disease, endothelial damage and advanced diabetes complications, there are no major intervention studies on this subject.

The study summarised below is a cohort study. The first cohort of 404 individuals had little CV risk reduction therapy, as would be expected in the late 1990s. From 2001, a cohort of 251 people with new foot ulcers were universally recommended to have effective dose statins and anti-platelet therapies, with ACE inhibitors and beta-blockers when appropriate. Nearly 90% were started on statins and anti-platelet therapies, and around 60% on ACE inhibitors. Five-year actual mortality reduced from 48.0% in cohort 1 to 26.8% in cohort 2 (odds ratio: 2.51, 95% confidence interval: 1.68–3.75, $P<0.001$). The age at death was also older in cohort 2, suggesting that an aggressive policy of CV risk management can prolong life after foot ulceration.

The massive reduction in 5-year mortality was a surprise, but is in keeping with previous studies, which have demonstrated the largest absolute benefits in the highest risk groups. Also interesting was the fact that benefits were seen not only in those with neuroischaemic foot ulceration associated with clinically detectable peripheral vascular disease, but also in those with neuropathic foot ulceration where the peripheral circulation, on a macrovascular level at least, was intact.

When our intervention policy started I was unsure as to whether the level of vascular damage might be so great as to negate any positive benefits from treatment, but it would appear that it is not, and that a foot ulcer is a marker of vascular risk which is as serious as a myocardial infarction and should be treated in the same way.

DIABETES CARE

CV risk management improves mortality

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓✓

1 This study assessed whether aggressive targeting of CV risk factors in people with diabetic foot ulcers would improve their survival.

2 In cohort 1, 404 people with diabetic foot ulcers were followed up for 13 years (1995–2008); in cohort 2, 251 people with diabetic foot ulcers were followed up for 4 years (2004–08).

3 Successful CV risk factor management in cohort 1 was used to formulate an aggressive CV risk policy that was implemented in cohort 2. CV risk assessments and mortality rates were calculated for both groups.

4 The overall 5-year mortality of 48.0% in cohort 1 was reduced to 26.8% in cohort 2, with improved survival for both neuroischaemic (58% reduced to 36%) and neuropathic (36% reduced to 19%) patients.

5 Aggressive CV risk management has improved survival for people with diabetic foot ulcers.

Young MJ, McCardle JE, Randall LE, Barclay JI (2008) Improved survival of diabetic foot ulcer patients 1995–2008. *Diabetes Care* **31**: 2143–7

FOOT AND ANKLE INTERNATIONAL

Amputation and current foot ulcers affect quality of life

Readability	✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 Diabetes is a common cause of foot complications and resulting lower-limb amputations, placing an enormous economic burden on society.

2 Additionally, amputation has a highly traumatic effect on the person with diabetes, which must not be underestimated.

3 This study sought to determine the effect of amputation for a diabetic foot ulcer on the physical and social aspects of people's quality of life (QoL).

4 QoL was compared between two groups: 25 people who underwent an amputation for a diabetic foot ulcer at least 1 year previously; and 9 people who were outpatients for a current foot ulcer with no history of amputation.

5 QoL was measured using the Medical Outcome Study Short Form 36-item health survey (MOS SF-36).

6 When comparing different items of the MOS SF-36 between the two groups, the only statistically significant difference was for "bodily pain", which was higher in the group with current foot ulcers.

7 Poor global scores on the MOS SF-36 for both groups indicate that foot ulcers have a strong impact on QoL, with social and psychological implications.

8 The amount a person suffers from a diabetic foot ulcer must not be underestimated, as the QoL of amputees was similar to the QoL of current sufferers.

9 A multidisciplinary approach is needed to consider all aspects of diabetic foot complications.

Boutoille D, Féraille A, Maulaz D, Krempf M (2008) Quality of life with diabetes-associated foot complications: comparison between lower-limb amputation and chronic foot ulceration. *Foot Ankle Int* **29**: 1074–8

DIABETES AND METABOLISM

MDROs do not affect ulcer healing if treated aggressively

Readability	✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓

1 People with diabetes commonly suffer foot ulcer infections, for example by *Staphylococcus aureus*.

2 In recent years there has been an increase in multidrug-resistant organisms (MDROs), such as meticillin-resistant *S. aureus* (MRSA).

3 In order to evaluate the risk factors for acquiring MDRO infections and their impact on healing, 188 individuals admitted with infected diabetic foot ulcers were prospectively studied.

4 Specimens for bacterial culture were taken, and the infections clinically diagnosed and graded in severity; follow-up was for 1 year after discharge, or until the infection had healed.

5 In total, 271 bacteria were isolated from the 188 samples; 45 people (23.9%) had MDRO infection (the most common infection was MRSA, found in 62.7% of the MDRO cultures).

6 Logistic regression analysis showed that previous hospitalisation and proliferative retinopathy significantly increased MDRO infection risk.

7 MDRO infection did not significantly affect ulcer healing time when managed with an early, aggressive treatment procedure.

8 The high prevalence of MDROs found in infected diabetic foot ulcers did not affect ulcer healing time when immediate, broad-spectrum antibiotics were given at the time of first culture, and then adjusted according to the bacteria isolated.

Richard J-L, Sotto A, Jourdan N et al (2008) Risk factors and healing impact of multidrug-resistant bacteria in diabetic foot ulcers. *Diabetes Metab* **34**: 363–9

AMERICAN JOURNAL OF HEALTH-SYSTEM PHARMACY

Modified vancomycin protocol superior to conventional dosing

Readability	✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 *Staphylococcus aureus* is commonly found in diabetic foot infections, with an increasing prevalence of meticillin-resistant *S. aureus* (MRSA).

2 Vancomycin is a broad-spectrum antibiotic effective against MRSA, although therapeutic drug monitoring is needed to prevent nephrotoxicity.

3 This study compared the efficacy of a modified vancomycin-dosing regimen with conventional vancomycin treatment for people with diabetic foot infections caused by MRSA.

4 The study population comprised 85 people with diabetic foot infections caused by MRSA: 43 people received conventional vancomycin treatment (10–15 mg/kg [up to 1 g] administered over an hour every 12 hours if serum creatinine (SCr) levels were 0.4–1.4 mg/dL); 42 people were treated with a modified vancomycin protocol, whereby dose was determined by SCr level, age and gentamicin dosage.

5 People receiving conventional vancomycin therapy had higher levels of serum vancomycin than recommended by the *British National Formulary (BNF)*.

6 People in the modified vancomycin-dosing regimen received lower doses of vancomycin, and levels remained within the recommended range in the *BNF*.

7 The modified vancomycin-dosing protocol was superior to conventional treatment as it achieved therapeutic serum levels of vancomycin without compromising healing time.

Niu S-C, Deng S-T, Lee M-H et al (2008) Modified vancomycin dosing protocol for treatment of diabetic foot infections. *Am J Health Sys Pharm* **65**: 1740–3

DIABETOLOGIA

One-to-one footcare education does not offer clinical benefit

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓✓

1 Diabetic foot complications are difficult to treat and can lead to amputation in severe cases.

2 It is therefore key that people with diabetes are educated about foot care so that complications are understood and can be prevented.

3 This study determined the effectiveness of patient education in reducing the incidence of diabetic foot ulcers; people with diabetes and recently healed foot ulcers received either one-to-one footcare education (intervention group; n=87) or usual care (control group; n=85).

4 The primary outcome measure was ulcer incidence at 12 months; secondary measures included incidence of amputation, mood and quality of life at 6 and 12 months.

5 There were no significant differences (P>0.05) between the intervention and the control groups in ulcer incidence at both 6 months (intervention group 30%, control group 21%) and 12 months (intervention group 41%, control group 41%).

6 Additionally, the targeted, one-to-one footcare education programme had no significant (P>0.05) effect on incidence of amputation, or on people's mood and quality of life.

7 Improved footcare behaviour was seen in the intervention group at 12 months.

8 Despite promoting better foot care, the educational intervention did not improve clinical outcome for these high-risk individuals; further evaluation is needed.

Lincoln NB, Radford KA, Game FL, Jeffcoate WJ (2008) Education for secondary prevention of foot ulcers in people with diabetes: a randomised, controlled trial. *Diabetologia* **51**: 1954–61

> *"... the targeted, one-to-one footcare education programme had no significant effect on incidence of amputation, or on people's mood and quality of life."*