Lower limb complications

Death and all his friends

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Patients with diabetic foot ulceration or Charcot joints die sooner than patients with myocardial infarctions or most cancers. So far there has been only one paper showing that aggressive cardiovascular (CV) risk reduction might be able to reduce this mortality (Young et al 2008), and now a further cohort study confirms that, despite the growing attention to blood pressure (BP), lipids and diabetes control in people with diabetes, the mortality from foot ulceration persists. Morbach et al (2012; summarised alongside) report cumulative mortalities in patients with diabetic foot ulceration at years 1, 3, 5 and 10 of 15.4%, 33.1%, 45.8% and 70.4%, respectively.

Two of the biggest predictors of mortality in the Morbach study were renal disease and peripheral arterial disease (PAD). These are also two of the main correlates of abnormal ankle–brachial pressure indices (ABI). Renal disease is associated with arterial calcification, stiffening blood vessels and raising BP. PAD is associated with low ABI by reducing peripheral blood flow. Renal disease and PAD are frequently associated with cardio- and cerebrovascular disease, and hence mortality. It therefore follows that abnormal ABIs, either high (vascular calcification) or low (PAD), will also be associated with increased mortality rates. Doza et al (2012; summarised on the facing page) looked at surrogate markers for CV risk and death by measuring BMI, systolic BP, lipids, and other parameters, and their relationship to low ABIs; they concluded that low ABI is a marker of increased CV risk.

Hanssen et al (2012; summarised on the facing page) studied a population cohort of 624 middle-aged residents of Hoom, The Netherlands. Over 17 years, 46% of these people died, but mortality in the diabetes group was 50% higher. In total, 41% of the 469 people without diabetes and 63% of the 155 people with diabetes died over this period. When the authors examined potential risk factors for mortality, 80% of people with an ABI of <0.9 died compared with only 40% of those with an ABI >0.9; however, what was particularly interesting was that a low ABI predicted an increased CV and all-cause mortality in people with and without diabetes.

It remains clear that vascular disease is a serious health problem and that people with diabetes are much more at risk of developing this than the general population. A foot ulcer, even a neuropathic one, is a marker of generalised vasculopathy and we should start to treat all people with foot ulcers with the same (or more) CV secondary prevention measures as a myocardial infarction if we want to help them live longer.

Young MJ, McCardle JE, Buchanan LE et al (2008). Improved survival of diabetic foot ulcer patients 1995–2008: Possible impact of aggressive cardiovascular risk management. *Diabetes Care* **31**: 2143–7

Lower-limb rehabilitation: Target patients' needs

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

1 The authors set out to assess post-acute rehabilitation 1-year survival rate and rate of prosthesis fit, and report on discharge-associated factors in 117 elderly people with lower limb amputation (transtibial amputation [TTA; *n*=56], transfemoral amputation [TFA; *n*=46] and bilateral amputation [*n*=15]).

2 The most common cause of amputation was diabetic foot (*n*=71; 60.7%). Only 23.1% of the cohort (*n*=27) were suitable for prosthetic rehabilitation; the rate of prosthesis fit in uni- and bilateral amputees was 24.5% and 20%, respectively, when bilateral amputees were considered separately.

3 One-year post-amputation mortality rate was 46.2% (*n*=54): 50/90 (55.5%) and 4/27 (14.8%) in the wheelchair and prosthetic rehabilitation groups, respectively.

4 The authors concluded that lower limb rehabilitation should target the needs of the patient.

Hershkovitz A, Dudkiewicz I, Brill S (2012) Rehabilitation outcome of post-acute lower limb geriatric amputees. *Disabil Rehabil* 11 Jun [Epub ahead of print]

Long-term limb salvage in diabetic foot patients

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

1 This was the first study to prospectively evaluate long-term data on limb amputation and mortality in people with diabetic foot ulcers over a period of >10 years.

2 The authors followed 247 people who consecutively presented to a diabetes centre with new diabetic foot ulcers (between June 1998 and December 1999) until May 2011 or death. Time to first amputation and to death were analysed using Kaplan–Meier curves and Cox multiple regression.

3 At recruitment, 86.2% (*n*=213) and 55.5% (*n*=137) of people had neuropathy and peripheral arterial disease (PAD), respectively.

4 During the follow-up period, 15.4% (*n*=38) of the cohort had a first major amputation. All except one of these cases had PAD at recruitment. At 1, 3, 5 and 10 years, the cumulative probabilities of a first major amputation were 8.7%, 12.5%, 15.9% and 22.3%, respectively.

5 At the end of follow-up, 70.4% (*n*=174) of the cohort had died. The cumulative mortalities were 15.4%, 33.1%, 45.8% and 70.4% at 1, 3, 5 and 10 years, respectively.

6 Factors that significantly increased the risk of major amputation included age, dialysis, and PAD at inclusion. Death was significantly predicted by baseline age, male sex, chronic renal insufficiency and PAD.

7 The authors concluded that, despite favourable limb salvage, the study results highlighted poor survival among people with diabetic foot ulcers and PAD, renal insufficiency, or a combination of the two.

Morbach S, Furchert H, Gröblinghoff U et al (2012) Long-term prognosis of diabetic foot patients and their limbs: amputation and death over the course of a decade. *Diabetes Care* **35**: 2021–7

J ANTIMICROB CHEMOTHER

MRSA infections of the foot: Cost savings using linezolid

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

1 Management of diabetic foot ulcers can be significantly complicated by infection with methicillin-resistant *Staphylococcus aureus* (MRSA). Linezolid is not a first-line antibiotic treatment for diabetic foot infections but can be used to minimise inpatient admissions.

2 The authors audited outpatient linezolid usage in 704 people attending the Diabetes Foot Clinic at the Royal Infirmary of Edinburgh, Scotland, from 2005 to 2010. Admissions (defined as a length of inpatient hospital stay), antibiotic usage and microbiological culture results were recorded.

3 Clinical effectiveness of linezolid was defined as resolution of MRSA infection (downgrading of ulcer to IDSA [Infectious Disease Society of America] grade 1 or 2 infection) and avoidance of admission for further treatment.

4 MRSA infection was diagnosed in 17% (n=119) of the cohort, of whom 28% (n=33) were prescribed linezolid. In 94% of people, linezolid was prescribed for up to a maximum of 14 days. No one took linezolid for more than 28 days.

5 Admission for further treatment was avoided or early discharged facilitated and infection resolved in 91% (n=30) of people taking linezolid – the total cost of linezolid was £58 000.

6 Linezolid treatment of MRSA diabetic foot infections avoided 420 bed-days (at a cost of £500/day), and yielded a total saving of £210 000 on inpatient costs. The authors concluded that linezolid treatment is cost-effective in clinical use for treatment of diabetic foot infections.

Young MJ, Hodges G, McCardle JE et al (2012) Cost avoidance using linezolid for methicillin-resistant *Staphylococcus aureus* infections in a specialist diabetes foot clinic. *J Antimicrob Chemother* 17 Aug [Epub ahead of print]

J AM PODIATR MED

Osteomyelitis: Limb-sparing treatment

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

1 The authors investigated the diabetic foot osteomyelitis treatment outcomes of early surgical debridement or limited amputation combined with antimicrobial treatment in 50 people treated between 2005 and 2007.

2 The primary end point was cure of osteomyelitis (defined by no further treatment of the affected limb) and the secondary end point was limb salvage.

3 Initial treatment using local amputation (most commonly toe amputation) was performed in 43 (85%) of people, and debridement performed in seven (14%).

4 A total of 45 people (90%) used antimicrobials. Pathological evidence of osteomyelitis at the surgical margin (n=31) resulted in a median duration of 43 days of treatment. Infections were polymicrobial in 60% of cases (n=30).

5 After a median follow-up of 26 months, 64% of people (n=32) were considered cured. Limb salvage was achieved in 94% of the cohort (n=47).

Beieler AM, Jenkins TC, Price CS et al (2012) Successful limb-sparing treatment strategy for diabetic foot osteomyelitis. *J Am Podiatr Med Assoc* **102**: 273–7

DIABETES CARE

The ABI: A predictor of CV and all-cause mortality

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

1 The authors investigated the associations between ankle–brachial index (ABI) and cardiovascular (CV) and all-cause mortality in people aged 50–75 years with and without diabetes (n=155 and n=469, respectively).

2 Over a median follow-up of 17.2 years, ABI was studied continuously at cut-off points of <0.9, <0.1 and <1.1. Alternatives to the ABI were also investigated in people with diabetes.

3 An ABI of <0.9 was strongly associated with CV and all-cause mortality, independent of having diabetes.

4 Toe brachial index and Doppler flow curves were not more strongly related to mortality than ABI in people with diabetes.

Hanssen NM, Huijberts MS, Schalkwijk CG (2012) Associations between the ankle-brachial index and cardiovascular and all-cause mortality are similar in individuals without and with type 2 diabetes: nineteen-year follow-up of a population-based cohort study. *Diabetes Care* **35**: 1731–5

INT J HYPERTENS

Low ABI values and CV risk in T2D

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

1 The authors studied the association between ankle–brachial index (ABI) levels and cardiovascular (CV) risk factors in people with T2D from North India (n=1121; 671 male and 450 female).

2 CV disease (CVD) history, blood pressure (BP), height, weight, BMI, ABI and branchial–ankle pulse wave velocity (baPWV) were recorded. Clinical features and their association with ABI were compared between men and women.

3 Low ABI (<0.9) was present in 4.67% of women and 4.47% of men. BMI and baPWV were significantly higher in women (P<0.001).

4 In both sexes, low ABI (<0.9) was significantly associated with CVD risk, and systolic and diastolic BP were significantly negatively correlated with ABI.

5 The authors concluded that a low ABI may be a useful predictor for CVD but that further studies are needed.

Doza B, Kaur M, Chopra S et al (2012) Cardiovascular risk factors and distributions of the ankle-brachial index among type 2 diabetes mellitus patients. *Int J Hypertens* **2012**:485812.

> *"Toe brachial index and Doppler flow curves were not more strongly related to mortality that ankle brachial index in people with diabetes."*