

FDUK 2016: Defusing diabetic foot disasters — time is of the essence

Trisha Barker

The 12th FDUK masterclass on the foot in diabetes, with its explosive theme and focus on ensuring patients are identified early and receive timely treatment, was held on 15th November 2016 in Harrogate, UK, in conjunction with the ever-popular Wounds UK annual conference. The programme reviewed foot disease and its management, provided interactive workshops, and ended on implementation of gold standard care.

Dr Paul Chadwick opened the November 2016 FDUK masterclass with a summary of the organisation's current position. FDUK now has over 2,000 members, plays a key role in Diabetes UK, has had a representative on a number of Parliamentary committees (the All-Party Parliamentary Limb Loss Group and the Diabetes Think Tank) and is involved in the 'Putting Feet First' initiative. FDUK is growing and provides strategic direction nationally.

FDUK's plans for the future include strengthening the governance arrangement, revising the current constitution and the election of new committee members to encourage greater newcomer involvement in the organisation. The call to get involved was loud and clear.

An exploding bomb: the current state of diabetic foot disease

The masterclass started with an examination of the current state of play in diabetic foot disease treatment and management. William Jeffcoate, consultant at Nottingham University Hospitals NHS Trust, began by speaking of the enormous burden of diabetic foot disease, which accounts for 0.6% of the total NHS budget (NHS Diabetes, 2012). There are currently ten-fold variations in numbers of major amputations across the country. He

reminded the audience of the 2015 Diabetes UK campaign highlighting the fact that there are 135 diabetes-related amputations a week. He also sounded a word of caution when considering this figure, however, as Diabetes UK made no distinction made between minor and major amputations, and the inclusion of minor amputations is not good or useful evidence. Even with major amputations, an amputation is a treatment, and is not a good measure of disease burden.

The diabetic population in the UK is increasing, not just because of poor diet and sedentary lifestyles but, more optimistically,

“Can your area refer patients with diabetic foot ulcers to a specialist team within 48 hours?”

because there are larger screening programmes leading to earlier diagnosis and the opportunity to prevent more complications. There are also different criteria for diabetes. With diagnosis coming 10–15 years earlier than would previously have been the case, however, complications do arrive.

There is a need to look at improvements in numbers of amputations. Diabetes UK has suggested that 80% of amputations can be avoided (Diabetes UK, 2016). Dr Jeffcoate admires this claim, but puts the figure at closer to 25%. Middlesbrough and Ipswich have recently shown an impressive reduction of three major amputations per 1,000 people, taking

the number down to 0.8 per 1,000 people with diabetes (Boulton, 2013).

One of the tools that Dr Jeffcoate believes will assist in the measurement of services is the National Diabetes Footcare Audit (<http://content.digital.nhs.uk/footcare>). This provides ongoing monitoring of geographical variation, finds links in outcomes and justifies existing guidelines. New ulcers are documented and matched to their NHS number to gather other demographics. The ulcers are graded using the Site, Ischaemia, Neuropathy, Bacterial infection And Depth (SINBAD) classification, and the time from first presentation to receipt of specialist care is recorded. The structure of the audit encourages training in foot screening, and promotes the formation of foot protection teams. Dr Jeffcoate asked: “Can your area refer patients with diabetic foot ulcers to a specialist team within 48 hours?” The aim of the audit is to record all diabetic foot ulcers. It is thought, however, that only a tenth are currently being captured.

The data from the national audit need to be interpreted with care. Overall, healthcare professionals are doing well, but they could do better. The aim proposed by Dr Jeffcoate is to increase participation in the audit and bring amputation rates down to 0.6 per 1,000 person years.

After the bomb has exploded: limb salvage

Peripheral arterial disease

Professor Robert Hinchliffe, clinical professor of vascular surgery at the School of Social

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and Community Medicine, University of Bristol, discussed the role of the vascular surgeon in his presentation. He sees vascular surgeons as being able to hasten healing, prevent amputation and improve the patient's quality of life. In order to achieve this, he said, surgeons have to pick patients who will respond well to treatment and leave stable, static or fragile patients to be treated conservatively.

Surgeons need to question whether the patient has peripheral arterial disease (PAD). If the patient's PAD is adversely affecting healing, the surgeon needs to consider whether revascularisation will benefit the patient and how can it be carried out.

PAD is found in 20–30% of the adult population with diabetes (compared with 5% of the non-diabetic population), and is frequently asymptomatic. The patient's history of PAD can be benign; however it must be remembered that PAD is an important precursor to cardiovascular risk. Prof Hinchliffe stated that "clinical limb ischaemia" is an unhelpful term in diabetic foot ulcers. A patient might have tissue loss and "mild" PAD, but this can result in ulceration.

Regarding tests to determine PAD, Prof Hinchliffe did not feel palpation of the patient's pulse to be reliable in the identification or exclusion of PAD. Non-invasive tests, such as ankle-brachial pressure index (ABPI), toe pressures and transcutaneous oxygen, were seen as useful tests to provide information about perfusion of the foot as they give information relating to prognosis. Toe pressures are useful in the exclusion of PAD. Healing is unlikely if a patient's toe pressure is <55mmHg. A useful tip was that ABPI can be trusted when low, but not when high. When faced with an ankle-brachial pressure index >0.6 and toe pressure >55mmHg, a trial of 6 weeks' best wound care should be undertaken and reviewed before revascularisation is considered. Triphasic Doppler signals can also be utilised to determine the presence of PAD. For a reliable prognosis of healing, the best indicator is a transcutaneous oxygen level >25mmHg and, following amputation, an ankle pressure >50mmHg.

Anatomical perfusion, in contrast, is not so important in measuring PAD. For anatomical information, duplex scanning, computed tomography angiography, magnetic resonance angiography and digital subtraction angiography should be carried out. These imaging techniques will help guide intervention.

When making the decision to revascularise a patient, PAD is only one factor that needs to be considered. The clinician also needs to consider ulceration, the state of the limb and, most importantly, the patient.

Ischaemia and infection

David Russell, consultant vascular surgeon at Leeds General Infirmary and honorary clinical associate professor, spoke of the importance of ischaemia and infection together resulting in much more serious outcomes. The addition of diabetes and other comorbidities to this mix, along with the distribution of disease and the general lack of guidelines in this area, makes the treatment of ischaemia and infection significantly more difficult.

He also reminded us to consider angiosomes. There is a need to target vessels related to ulcer location. Special mention was made of orphan heel syndrome — a triad of chronic kidney disease, heel ischaemia and diabetes.

Urgo Award winners 2016

The Urgo Foundation grants awards every year to healthcare professionals who have innovative ideas, start initiatives and develop practices for the prevention and management of diabetic foot ulcers. The 2016 Urgo awards were presented to the two winners by Mike Edmunds, consultant diabetologist at King's College Hospital, London, and Michelle Deeth, head of clinical services at Urgo. Each gave a brief outline of his or her winning application. Andrew Sharpe, Advanced Podiatrist and Team Leader Southport and Ormskirk NHS Trust and Lecturer Practitioner, University of Huddersfield, plans to cultivate a data bank of Doppler sounds to aid education and develop practitioners' confidence in identifying different signals. Professor William Jeffcoate, Consultant, Nottingham University Hospitals Trust, won for his proposal for a regional

research network. The £20,000 prize was shared equally between the two.

The 2015 winners David Russell and Rose Cooper were present to talk about how their projects were progressing. David has developed an ultrasound application that can be used to detect infection. In diabetes, signs of infection are often dampened. His department is already using ultrasound in the diagnosis of infective arthritis, differentiating between acute and chronic infections. The advantage of this technique is that it can be used in the clinic and there is no radiation involved. Information from the ultrasound scan can be used to guide local and systemic interventions.

Rose Cooper, professor of microbiology, and Rowena Jenkins, lecturer in microbiology, at Cardiff Metropolitan University, reminded those present that the first antibiotic-resistant organism was found in 1944. In 50 years' time they believe we will not have antibiotics, and they predicted that as a result of this there will be 50 million deaths. The flora of diabetic foot ulcers is polymicrobial, with increasing resistance. They are developing ways to better identify and subsequently tackle this polymicrobiology.

After the bomb has exploded

Charcot foot

Ketan Dhatariya, consultant in diabetes, endocrinology and general medicine at the Elsie Bertram Diabetes Centre, Norfolk and Norwich University Hospitals NHS Foundation Trust, gave a presentation on the management of Charcot foot. This relatively painless but destructive arthropathy is a devastating complication, being reported in one in 200 people with diabetes, and it is not just found in the feet.

The aetiology of Charcot foot can be diabetes, syphilis, leprosy, alcoholism, spinal cord injury, Parkinson's disease, HIV, rheumatoid arthritis or long-term amiodarone



use. It develops through a cycle of trauma and inflammation. With the loss of proprioception, the foot sustains microtraumas that increase perfusion (also related to autonomic deficiency) and produce inflammation, prompting osteoclast activity, osteopenia, fracture and deformity.

The first thing to do when Charcot is suspected is to attempt to exclude Charcot. Pain in something not usually sensate should ring alarm bells, according to Dr Dhatariya. Due to the cycle involving inflammation, it is unusual to have Charcot in an ischaemic foot.

Management needs to begin with referral to the multidisciplinary team within 1 day. The patient must be kept non-weight-bearing until treatment is started. This is a podiatry emergency, and as such needs to be treated as soon as possible. A person presenting with acute Charcot with early diagnosis and immobilisation is still 12 times more likely to undergo amputation and has a decrease in life expectancy of 14 years, compared with the general population (van Baal et al, 2010). Deformity can lead to ulceration, with the psychological impact leading to high levels of anxiety and/or depression. There is a potential for loss of limb or life. Immobility can lead to social isolation and can have a detrimental impact on employment. If healthcare professionals react rapidly, this complication is potentially preventable.

Treatment of Charcot foot needs to be holistic. Charcot foot is treated with a combination of immobilisation, good diabetes control, the treatment of wounds and/or infections. The use of bisphosphonates has been discredited, Dr Dhatariya pointed out. Surgery can depend on the enthusiasm of the local orthopaedic team, and there is little evidence for this approach.

Resolution can be measured as a clinical temperature of $<2^{\circ}\text{C}$ for three consecutive visits 2 weeks apart with no further changes on imaging. Step-down management involves the use of a removable walking boot. Once in said boot for 3 hours a day, the patient with normal

temperature can move on to orthotics and regular reviews.

Infection

Professor Cooper spoke of the need to recognise infection before planning interventions and monitoring progress. If problems are encountered, then this process must be revised. There needs to be a pattern of reflection and revision.

Individuals with increased microbial virulence and decreased immunocompetence will develop infection. The concept of critical colonisation is now considered outdated, she said. There is a necessity to examine the microbes, not just bacteria, involved.

Guidelines on the diagnosis and management of diabetic foot infection have been produced by the International Working Group on Foot Infections (Lipsky et al, 2016), Professor Cooper pointed out. In a person with

diabetes, the presence of foot infection can be judged based on the presence of local or systemic signs, but the role of the laboratory also needs to be considered. The tests may be conducted and sensitivities found, but in the laboratory microbes are grown in artificial way. Clinicians need to provide full information regarding the patient's presentation and history, so that different treatments can be suggested.

Professor Cooper reminded those present that 50% of medicines are inappropriately prescribed, dispensed or sold. In addition to this, half of patients take their medications incorrectly. She pointed out that in mild infections, 43% of individuals are treated incorrectly. In a retrospective study of only 200 cases, there were 35 different treatments, with no uniformity. The National Institute for Health and Care Excellence (NICE) does not support the use of antimicrobial dressings (NICE, 2016). When a wound fails to heal and becomes chronic, invisible biofilms can

develop. These often consist of more virulent bacteria. Sixty per cent of chronic wounds have a biofilm (Phillips et al, 2010). They have slow growth rates and are very tolerant of antimicrobial dressings. To manage chronic wounds, clinicians therefore need to prevent biofilms from forming. Debridement is effective as it reduces the bacteria burden, and when bacteria are actively growing they are susceptible to treatment. In cases where a biofilm is suspected, a biopsy needs to be taken.

Workshops

Next came a series of workshops looking at the psychology of discussing poor outcomes with patients, rehabilitation following major amputation, and bringing research to life.

Talking to patients about poor outcomes: a psychological approach

Rose Walker, education director of Successful Diabetes, ran the workshop on talking to patients about poor outcomes. The theory behind this particular psychological approach is Experience, Reflection, Insight and Change (ERIC).

HbA_{1c} may be a reflection of a person's life, but it does not reflect the effort that went into achieving it. The important point was that people are not turned into 'patients' just because they have a disease. An individual's thoughts, feelings and beliefs are all key influences of behaviour.

An individual can be asked what they think of a situation or the future, how they feel about their current situation or risk of problems, what they think caused this or how it will affect their chances of problems. Responses to these questions can vary. The examples given were familiar, but the opportunity for onward discussions relating to responses was new:

■ *Everyone in the family has complications, not surprised I have them.*

Instead of dismissing the patient, this could be a chance to discuss his or her

“Charcot foot is a podiatry emergency, and as such needs to be treated as soon as possible.”

feeling of autonomy of their disease. In this example, the patient appears to think that he/she cannot achieve such autonomy.

■ *I was wondering if it was my weight.*

This response can open up an honest conversation.

■ *I never thought I'd make old bones.*

This is a very powerful thing to say. A patient can be asked where the belief comes from.

■ *I want to get better, I'll do anything.*

There is an opportunity with all of these statements to start an honest discussion and empower patients by providing the information they want. There is a lot healthcare professionals can do. Consideration should be given to what that would be like for the individual and how he/she can be helped the most.

The peace process: quality of life post-amputation

Fiona Davie-Smith, post-graduate research student at the Nursing and Health Care School, University of Glasgow, presented a piece of research looking at 171 PAD patients with and without diabetes, followed up every 6 months post amputation until death. Her research incorporated a quality of life questionnaire, reintegration to normal living index, and a prosthetic limb user survey of mobility.

The research found that 67% of participants lived in deprived areas, and in those areas patients were younger when they had their amputation. Unsurprisingly, renal function was poorer in patients with diabetes. More individuals with diabetes lived with family members. There were fewer smokers and more non-drinkers in the diabetic cohort.

Of the 171 patients, 40% received a prosthetic leg, but this did not mean that they walked on it. The remaining 60% did not get a prosthetic limb, meaning they had to stay in a wheelchair. The main factor deciding whether a participant received a limb was level of health before surgery. If, for whatever

reason, the participant did not receive a limb, he or she was seven times more likely to die within the duration of the study.

Participants' quality of life was better if they received a prosthetic limb. Patients post amputation had negative scores; they perceived their situation as "worse than death". If a limb was fitted 6 months later, men had a better quality of life than women, and this included better reintegration, going out more and socialising, not just walking.

The researchers conducted face-to-face interviews and found the factor that made the biggest difference to quality of life was participation post amputation. If a participant was able to get a prosthetic limb and do the things he or she did before the amputation, he/she had higher quality of life scores. This improvement in quality of life was regardless of socioeconomic scale, whether or not the participant had diabetes, or any other factors measured. Finding your Feet (www.findingyourfeet.net) is a registered charity that helps patients maintain engagement and participation post-amputation and supported this research.

Bringing your research to life

Catherine Bowen, professor of health sciences at the University of Southampton, ran an interactive workshop that examined the multitude of ways to access research funding.

The burden of wounds on the NHS: a detailed analysis for diabetic feet

The debate moved into the big hall, where Julian Guest, founder and managing director of CATALYST, and Duncan Strang, diabetes foot coordinator for Scotland and Scottish FDUK representative, tackled the question of why we are not making more progress in diabetic foot

treatment. Following a detailed account of the impact of diabetic feet on the individual through to the wealth of the nation, the conversation moved onto how to implement gold-standard care uniformly.

Pathways and protocols to tackle complicated high-risk diabetic feet are now tried and tested methods, but implementation still varies across the country and the same issues are being raised time after time. This subject prompted many to come forward to speak. The frustration of the situation was palpable and the debate could have continued for much longer. Perhaps

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now these tried and tested protocols and pathways, the resolution of challenges to their implementation and recognition of the impact of diabetic foot problems will feature in the 2017 conference. ■

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