Glow in the dark ulcers

Neil Baker OBE
Consultant Podiatrist, 60 Degree Vascular and Diabetic Foot Clinic, Bneid Al Gar, Kuwait

This issue's *Digest* commentary is on the use of an autofluorescence imaging (AFI) device, MolecuLight i:X; in the management of diabetic foot ulcers (DFUs).

It is well known that DFUs frequently become chronic. One confounding reason is the presence and role of wound flora and biofilm formation. Clinically, it is also often difficult to determine the extent of bacterial wound contamination.

This AFI device is claimed to be able to help determine detrimental levels of bacterial wound contaminants. This was a randomised controlled trial pilot study to investigate and determine the role and effectiveness of AFI in managing DFUs.

Bacterial cell walls contain porphyrins and pyoverdines, which at certain concentrations will automatically fluoresce red or cyan (*Pseudomonas* species), with collagen and elastin emitting green fluorescence under certain wavelengths of violet light (590–690 nm).

The aims of this 12-week study were to determine healing rates, the influence of AFI upon clinical treatment decision-making and quality of life markers. In all, 56 subjects with non-infected DFUs were randomised to either a control (CG) or intervention group (IG). Standard wound care was given to both groups, with the intervention group having AFI used every 4 weeks. The influence on decision-making was deemed positive if antimicrobial dressings and/or further debridement were initiated following a positive AFI result. The groups were well matched for demographics, diabetes parameters, SINBAD scores and comorbidities. The IG had slightly smaller wound size (0.37 versus 0.54 cm^2), but a longer duration of 20 weeks versus 15 weeks (interquartile range). Healing occurred at 12 weeks in 45% (*n*=13/29) and 22.2% (*n*=6/27) in the IG and CG groups, respectively. Mean wound size reduction at 12 weeks was 91.3% and 72.8% in the IG and CG groups respectively. Cast walker or TCC offloading occurred in 34.5%(n=10) versus 22.2%(n=6) in IG and CG respectively.

Positive AFI influenced treatment change overall on 40.9% of subject visits, dropping from 56.3% at baseline to 27.3% at week 8. Adverse events occurred in 13.8% (*n*=4) and 22.2% (*n*=6) in IG and CG, respectively. No difference was found in quality of life between either group.

This study is underpowered, thus it is difficult to draw firm conclusions, but its data suggest that AFI may be a useful tool in helping to determine antimicrobial interventions during DFU treatments and may prevent chronicity.

Further powered studies are needed to further investigate the efficacy of this AFI device. ■

Rahma S, Woods J, Brown S et al (2022) The use of point-of-care bacterial autofluorescence imaging in the management of diabetic foot ulcers: a pilot randomized controlled trial. *Diabetes Care* 45(7): 1601–9

Lancet

Comparison of amitriptyline supplemented with pregabalin, pregabalin supplemented with amitriptyline, and duloxetine supplemented with pregabalin for the treatment of diabetic peripheral neuropathic pain

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

1 The authors assessed the efficacy and tolerability of combinations of first-line drugs for diabetic peripheral neuropathic pain (DPNP).

2 OPTION-DM was a multicentre, randomised, double-blind, crossover trial in patients with DPNP in 13 UK centres.

3 Participants were randomly assigned to three treatment pathways for 16 weeks: amitriptyline supplemented with pregabalin, pregabalin supplemented with amitriptyline, and duloxetine supplemented with pregabalin. Monotherapy was given for 6 weeks and was supplemented with combination therapy if there was suboptimal pain relief.

4 All three treatment pathways and monotherapies had similar analgesic efficacy. Combination treatment was well tolerated and led to improved pain relief in patients with suboptimal pain control with monotherapy.

Tesfaye S, Sloan G, Petrie J et al (2022) Comparison of amitriptyline supplemented with pregabalin, pregabalin supplemented with amitriptyline, and duloxetine supplemented with pregabalin for the treatment of diabetic peripheral neuropathic pain (OPTION-DM): a multicentre, double-blind, randomised crossover trial. *Lancet* 400(10353): 680–90

Stem Cell Res Ther

Effectiveness and safety of stem cell therapy for diabetic foot: a meta-analysis update

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

1 Stem cells show great potential in wound healing. This study aimed to evaluate the efficacy of stem cells in the treatment of diabetic foot.

2 All relevant studies in Cochrane, Embase, PubMed, Web of Science, China National Knowledge Infrastructure and WanFang databases were systematically searched. The outcomes consisted of ulcer or wound healing rate, amputation rate, new vessels, ankle-brachial index (ABI), transcutaneous oxygen pressure ($TcPO_2$), pain-free walking distance and rest pain score.

3 A total of 14 studies with 683 participants were included. The meta-analysis showed that stem cell therapy was more effective than conventional therapy in terms of ulcer or wound healing rate, improvement in lower-extremity ischaemia(new vessels), ABI, TcO_2, pain-free walking distance and rest pain score. The amputation rate was significantly decreased.

4 The meta-analysis showed that stem cells are significantly more effective than traditional methods in the treatment of diabetic foot and can improve the quality of life of patients after treatment.

Sun Y, Zhao J, Zhang L et al (2022) Effectiveness and safety of stem cell therapy for diabetic foot: a meta-analysis update. *Stem Cell Res Ther* 13(1): 416

Int J Low Extrem Wounds

The effect of foot care education for patients with diabetes on knowledge, self-efficacy and behavior: systematic review and meta-analysis

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

1 The authors aimed to analyse randomised controlled trials to determine the impact of foot care education on knowledge, self-efficacy and behaviour in patients with diabetes.

2 After a comprehensive literature search, the systematic review examined 26 studies, with a total of 2,534 subjects.

3 The mean duration of education for knowledge was 5.2 months. This duration was 4.8 months for behaviour and 4.5 months for self-efficacy. There were significantly difference in terms of knowledge (standardised mean difference [SMD] 1.656, 95% CI [1.014–2.299] $P<0.001$), and behaviour (SMD 1.045, 95% CI [0.849–1.242] $P<0.001$). However, no difference was found in terms of self-efficacy (SMD: 0.557, 95%CI [−0.402, 1.517] $P>0.05$).

4 The authors found that diabetic foot education improved the level of knowledge and behaviour of patients with diabetes, while not affecting their self-efficacy.

Yıldırım Ayaz E, Dincer B, Oguz A. The effect of foot care education for patients with diabetes on knowledge, self-efficacy and behavior: systematic review and meta-analysis. *Int J Low Extrem Wounds* 21(3): 234–53.

Ann Surg

Moderate to severe soft tissue diabetic foot infections: a randomized, controlled, pilot trial of post-debridement antibiotic treatment for 10 versus 20 days

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

1 The authors' aim was to determine if antibiotic therapy after debridement for a short duration (10 days), compared with a long duration (20 days), for soft-tissue infections of the diabetic foot resulted in similar rates of clinical remission and adverse events.

2 In this randomised, controlled pilot trial, the researchers enrolled 66 patients (17% women; median age 71 years), with 35 randomised to the 10-day arm and 31 to the 20-day arm.

3 Clinical remission was seen in 27 (77%) patients in the 10-day arm compared to 22 (71%) in the 20-day arm. There were a similar proportion in each arm of both adverse events (14/35 versus 11/31), and remission (25/32 versus 18/27). Overall, 13 patients had soft tissue diabetic foot infections that recurred as a new osteomyelitis— eight in the 10-day arm and five cases in the 20-day arm. A multivariate analysis demonstrated that rates of remission and adverse events were not significantly different with a 10-day compared to 20-day course.

4 The authors concluded that post-debridement antibiotic therapy for soft tissue DFI for 10 days had similar (and non-inferior) rates of remission and adverse events to 20 days.

Truong-Thanh, Gariani K, Richard JC et al (2022) Moderate to severe soft tissue diabetic foot infections: a randomized, controlled, pilot trial of post-debridement antibiotic treatment for 10 versus 20 days. *Ann Surg* 276(2): 233–8

" Autofluorescence imaging may be a useful tool in helping to determine antimicrobial interventions during diabetic foot ulcer treatments and may prevent chronicity. "