



The missing link

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

Welcome again to another *Diabetes Digest* commentary. While looking at the published papers over the past 3 months, I found it difficult to decide which one or two papers to single out. The paper I have chosen reminded me in an oblique way of Darwin and one of his quests ... 'the missing link'! The paper I would like to comment on and encourage you to read is by Zha and colleagues, entitled 'A bibliometric analysis of global research production pertaining to diabetic foot ulcers in the past ten years'. As the title suggests, it explores and reports on the published diabetic foot research activity over the past decade. The authors used a method of literature analysis by performing document co-citation and co-word visualisation analysis to reveal the research hotspots, frontiers and core literature. The literature in connection with diabetic foot ulcers (DFUs) from 2007 to 2018 was retrieved from the Web of Science Core Collection database (WoSCC). They used the WoSCC and CiteSpace software programme to analyse publication outcomes, journals, research direction, research hotspots and frontiers. Overall, 4,580 publications on DFUs were retrieved until March 22, 2018, although the data for 2018 was excluded as it only covered a 3-month period at the time of analysis. The authors report that the largest volume of diabetic foot ulcer literature was produced by the US ($n=1,495$), followed by the UK ($n=463$), China ($n=336$), Germany ($n=318$), Italy ($n=267$), Netherlands ($n=198$), India ($n=187$), France ($n=162$), Australia ($n=157$)

and Canada ($n=154$). Regarding the areas of highest research interest, the most common was related to surgery, other key topics were dermatology, endocrinology, orthopedics, internal medicine, cell biology, engineering, cardiology and pharmacology.

From the analysis, three current 'hot spots' within the literature were identified: "complications", "amputation" and "infection". Furthermore, the authors have suggested that three potential areas that are future research frontiers that require investigation, namely, infection, wound management and prediction studies.

This paper is worthy of your attention and it is encouraging to see the growing trend of research and publications in our 'less trendy' area of medicine. However, like Darwin, my mind is more fixated upon finding and dealing with the 'missing link' — i.e. the huge gap between knowledge and clinical outcomes, such as amputations and ulcer relapse.

It is clear that our understanding of diabetic foot pathology, science, treatments etc is growing, but so too is the global amputation rate ... every 20 seconds! Implementation of knowledge, skills and service structure does not seem to have had the same impact as research activity. Have we shifted our focus a little too much? Anyway, I recommend this paper, it is informative, encouraging and, hopefully, thought provoking. ■

Zha ML, Cai JY, Chen HL (2019) A bibliometric analysis of global research production pertaining to diabetic foot ulcers in the past ten years. *J Foot Ankle Surg* 58(2): 253–9

J Am Geriatr Soc

Tricyclic antidepressant and/or -aminobutyric acid-analog use is associated with fall risk in diabetic peripheral neuropathy

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

1 The risk of falls can increase with peripheral neuropathy. In terms of fall risk, the impact of pain management using tricyclic antidepressants (TCAs) or -aminobutyric acid (GABA) analogs is currently unclear due to the fact that these medications can also cause falls.

2 A historical cohort study was undertaken with 1-to-1 propensity matching of TCA/GABA-analog users and nonusers to examine the impact of these on fall and fracture risk in older people with diabetic peripheral neuropathy (DPN).

3 A nationally representative 5% Medicare sample was used in this study between the years 2008 and 2010. Some 5,550 patients with prescriptions of TCAs/GABA-analogs and 22,200 patients without prescriptions were identified by the authors. Both patient groups were stratified for fall history and then matched on the basis of propensity of receiving TCAs/GABA-analogs within each group.

4 TCA/GABA-analog usage was associated with a statistically significant increase in fall risk (adjusted hazard ratio [HR] = 1.11; 95% confidence interval [CI] = 1.03–1.20), but not fracture risk (adjusted HR = 1.09; 95% CI = 0.99–1.19). GABA-analogs or TCAs were found to raise fall risk and possibly fracture risk, therefore, the use of these drugs is a potentially modifiable risk factor for falls and fractures in the DPN population.

Randolph AC, Lin YL, Volpi E, Kuo YF (2019) Tricyclic antidepressant and/or -aminobutyric acid-analog use is associated with fall risk in diabetic peripheral neuropathy. *J Am Geriatr Soc* doi: 10.1111/jgs.15779. [Epub ahead of print]

Foot Ankle Surg

Gait changes in persons with diabetes: early risk marker for diabetic foot ulcer

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

1 With the increasing prevalence of diabetic foot ulcers (DFUs) and subsequent foot amputation in persons with type 2 diabetic neuropathy, the authors set out to identify the initial risk marker for DFUs.

2 Dynamic plantar pressure analysis was carried out for individuals with type 2 diabetes mellitus without neuropathy, patients with diabetic neuropathy with normal foot profile and, finally, healthy persons with normal foot profile.

3 A significant difference was discovered in terms of dynamic peak plantar pressure between normal foot profile and diabetic neuropathy ($P=0.035$), while no significant difference was found between neuropathy and diabetic neuropathy ($P=0.997$). Dynamic segmental peak plantar pressure results showed significant difference only in the medial heel region ($P=0.009$) among the three aforementioned groups.

4 Gait analysis of individuals with diabetes has been found to be an effective tool to identify those at risk of DFUs. This study showed that there is a difficulty in homogenous pressure distribution in participants with diabetic neuropathy, even prior to the onset of deformity and degeneration of plantar soft tissue.

Gnanasundaram S, Ramalingam P, Das BN, Viswanathan V (2019) Gait changes in persons with diabetes: early risk marker for diabetic foot ulcer. *Foot Ankle Surg* pii: S1268-7731(18)30305-9. doi: 10.1016/j.fas.2019.01.005. [Epub ahead of print]

J Wound Care

It is not diabetic foot: it is my foot

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

1 This qualitative study, which made use of patient interviews, focused on how inpatients receiving treatment for diabetes experience the disease, aiming to examine the subjective experiences of patients with diabetic foot ulcers (DFUs).

2 Participants were selected using a purposive sampling method, with a total of 15 patients chosen for the study. The authors analysed the patient interviews, determining that four main themes had arisen, namely 'developing diabetic foot', 'living with diabetic foot', 'coping with diabetic foot' and 'expectations'.

3 The majority of patients declared that they were afraid of losing their feet and expressed difficulties in coping with the situation they had been presented with. The patients interviewed explained that they expected the healthcare professionals that they dealt with to understand the difficulties they were experiencing in their lives.

4 The conclusion of this study underlined the fact that healthcare professionals should work alongside patient groups, in order to better understand the needs and experiences of patients, as part of in-service training programmes. It is recommended that these programmes should include therapeutic communication techniques, as well as models for professional patient-client communication.

Meriç M, Ergün G, Meriç C et al (2019) It is not diabetic foot: it is my foot. *J Wound Care* 28(1): 30–7 doi: 10.12968/jowc.2019.28.1.30

Plast Reconstr Surg

Skin hydration level as a predictor for diabetic wound healing: a retrospective study

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

1 A common disorder in patients with diabetes, xerosis, is defined as abnormal skin dryness and scaling. Due to the skin cracking, the possibility of bacterial entry increases, thus raising vulnerability to ulceration and infection. The authors deemed that maintaining adequate skin hydration may be vital for diabetic wound healing.

2 This retrospective study set out to determine and compare the effect of the skin hydration level on diabetic wound healing with the tissue oxygenation level — the latter is recognised as the most reliable factor in predicting diabetic wound healing.

3 This study included 263 people with diabetes with forefoot ulcers and skin hydration and transcutaneous oxygen pressure (TcPO₂) data was collected before and after percutaneous transluminal angioplasty (PTA). Skin hydration and tissue oxygenation were deemed 'poor', 'moderate' or 'acceptable', while wound healing outcomes were 'healed without amputation', 'minor amputation' or 'major amputation'. Wound healing outcomes were also compared for skin hydration at baseline, TcPO₂ at baseline, skin hydration post-PTA and TcPO₂ post-PTA. Each of these four parameters displayed statistically significant correlations with wound healing outcomes.

4 Skin hydration level may prove to be a useful predictor for diabetic wound healing. Skin hydration level before recanalisation was found to be superior to TcPO₂ for predicting wound healing.

Lee TY, Kim KB, Han SK et al (2019) Skin hydration level as a predictor for diabetic wound healing: a retrospective study. *Plast Reconstr Surg* doi: 10.1097/PRS.0000000000005474. [Epub ahead of print]

“Implementation of knowledge, skills and service structure does not seem to have had the same impact as research activity.”