

Forced migration and foot care in people with diabetes

Forced migration due to armed conflicts, natural disasters, and disease outbreaks often involves walking on terrain that is treacherous. The focus of *The Lancet Diabetes & Endocrinology* Series on diabetes in humanitarian crises is on health-care needs in catastrophic times,¹⁻³ but the Series barely touches on the topic of foot care. We believe that foot care should be of primary concern for people with diabetes in emergency situations. We recognise that peripheral neuropathy and insensate feet are a chronic complication of diabetes. However, lower-limb infection due to peripheral neuropathy and unsanitary conditions is common in humanitarian crises.⁴ Since foot lesions can originate from a solitary traumatic event and rapidly progress to gangrene and sepsis, loss of life from diabetic foot infections is both certain and uncounted. Moreover, the problem of diabetic foot disease might be magnified in Africa. The International Diabetes Federation estimates that 70% of Africans with diabetes are undiagnosed.⁵ Without a diagnosis, practices known to prevent or mitigate diabetic foot complications will not be implemented and people will die before presentation.⁶

Acute displacement exposes people with diabetes to situations and environments that exacerbate the risk for skin damage, foot ulceration, and infections. Loss of peripheral nerve sensation renders feet vulnerable to unnoticed traumas and repetitive insults due to the lack of protective perception of pain, pressure, or temperatures. Therefore, foot lesions are sustained from minor traumas such as stepping on a sharp object when walking barefoot or wearing inadequate footwear, such as flip-flops or shoes with deteriorating soles.⁷ When undetected and thus

unattended, callouses, cracks, fissures, and ulcers provide a gateway for bacteria and foot infections that spread rapidly to underlying tissues, bone, and the central circulation.⁸

Under the pressure of forced migration, foot assessment for people with diabetes needs to be prioritised early in any contact with the health-care system, no matter how rudimentary. Of all the complications of diabetes, life-saving foot care can be instituted by health-care workers and taught to displaced people. Living conditions can be optimised by providing cots to eliminate the need to sleep on the ground and risk exposure to rodent bites.⁸ Education about not walking barefoot, especially at night, to latrines can be provided.⁸ Clean water for wound care can be prioritised. In short, even in the absence of glucose control, antibiotic therapy, and surgical care, hygienic practices reinforced by education can be implemented. However, education is not an easy approach because people are not always aware they have diabetes, the concept of insensate feet and the danger they present can be difficult to teach, and walking barefoot might be both cultural and habitual.⁷ Furthermore the stress of harsh and uncertain circumstances can limit the ability of people to focus on self-care.

Foot infection provoked by walking due to forced migration is an acute and potentially deadly consequence of a chronic complication of diabetes. The Series on diabetes in humanitarian crises and the associated Boston Declaration describe the urgent need for research, resources, and protocol development for diabetes care for populations exposed to catastrophic events.¹⁻³ In view of the potentially important link between forced migration and foot injury, particularly in African populations, in people with diabetes (both diagnosed and undiagnosed), we propose that foot care protocols should be an area of primary concern.

We declare no competing interests. Both authors are supported by the intramural program of US National Institutes of Health.

Arsene F Hobabagabo, *Anne E Sumner
annes@intra.niddk.nih.gov

Section on Ethnicity and Health, Diabetes, Endocrinology, and Obesity Branch, National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health, Bethesda, MD, USA (AFH, AES); and National Institute of Minority Health and Health Disparities, National Institutes of Health, Bethesda, MD 20892, USA (AFH, AES)

- 1 Kehlenbrink S, Smith J, Ansbro E, et al. The burden of diabetes and use of diabetes care in humanitarian crises in low-income and middle-income countries. *Lancet Diabetes Endocrinol* 2019; **7**: 638-47.
- 2 Bouille P, Kehlenbrink S, Smith J, Beran D, Jobanputra K. Challenges associated with providing diabetes care in humanitarian settings. *Lancet Diabetes Endocrinol* 2019; **7**: 648-56.
- 3 Kehlenbrink S, Jaacks LM, on behalf of the Boston Declaration signatories. Diabetes in humanitarian crises: the Boston Declaration. *Lancet Diabetes Endocrinol* 2019; **7**: 590-92.
- 4 Shahin Y, Kapur A, Seita A. Diabetes care in refugee camps: the experience of UNRWA. *Diabetes Res Clin Pract* 2015; **108**: 1-6.
- 5 IDF. IDF diabetes atlas, 8th edn. Brussels: International Diabetes Federation, 2017.
- 6 Rigato M, Pizzolo D, Tiago A, Putoto G, Avogaro A, Fadini GP. Characteristics, prevalence, and outcomes of diabetic foot ulcers in Africa. A systemic review and meta-analysis. *Diabetes Res Clin Pract* 2018; **142**: 63-73.
- 7 Abbas ZG. Diabetic Foot—an African perspective. *JSM Foot Ankle* 2016; **1**: 1005.
- 8 Abbas ZG, Archibald LK. Epidemiology of the diabetic foot in Africa. *Med Sci Monit* 2005; **11**: RA262-70.

Author's reply

We thank Arsene Hobabagabo and Anne Sumner for highlighting the urgent issue of foot care in people living with diabetes in humanitarian settings. We agree that this is an often neglected and underappreciated component of diabetes care in populations undergoing forced migration, including in Africa. Unfortunately, data on this topic are scarce. This limitation was evident in the first Series paper on diabetes in humanitarian crises, in which none of the studies identified in our search of the scientific literature reported on foot care in this region.¹ Only five studies included any mention of peripheral neuropathy, diabetic foot, or amputations.²⁻⁶ Four of these studies assessed data from UN Relief

and Works Agency for Palestine Refugees programmes,²⁻⁵ which address the medical needs of a long-term and relatively stable population and are not representative of acute crisis situations.

Humanitarian organisations such as Médecins Sans Frontières (MSF) have identified foot care as an important component of routine care for people with diabetes and a topic to address with people on the move. To this end, MSF has developed basic tools to facilitate foot examinations, includes monofilaments in the standard equipment list, and provides picture-based foot care information leaflets to support patient self-management. Nevertheless, implementation of such tools is challenged by many factors, including time constraints, poor understanding of the importance of the issue, and discomfort from clinicians and patients regarding foot examinations. Simplified care protocols are needed to support inexperienced health-care providers in managing diabetes-related foot wounds. Since the management of foot ulcerations and infections is challenging in humanitarian settings, preventive care and patient education will remain key.

The Boston Declaration set four major targets to work towards during the next 3 years, of which one is the establishment of a unified set of clinical guidelines for diabetes in humanitarian crises.⁷ A consortium of international humanitarian organisations and academic institutions has formed that seeks to deliver on the targets outlined in the Boston Declaration. Many projects are currently underway, including the development of evidence-based clinical guidance and open-access educational material for the management and prevention of diabetes and its complications in humanitarian settings, for both people living with diabetes and health-care providers. As a fundamental component of care,

this work will include educational material on preventive foot self-care and early recognition and treatment of diabetic foot and its complications that can be adapted to African and other global settings. We very much welcome support and feedback on this important topic.

SK has received personal fees from Médecins Sans Frontières/Doctors Without Borders, Health Action International, and the Medicines Patent Pool unrelated to the present work. PB declares no competing interests.

*Sylvia Kehlenbrink, Philippa Boule
skehlenbrinkoh@bwh.harvard.edu

Division of Endocrinology, Diabetes and Hypertension, Brigham and Women's Hospital, Boston, MA 02115, USA (SK); and Médecins Sans Frontières, Geneva, Switzerland (PB)

- 1 Kehlenbrink S, Smith J, Ansbro É, et al. The burden of diabetes and use of diabetes care in humanitarian crises in low-income and middle-income countries. *Lancet Diabetes Endocrinol* 2019; **7**: 638–47.
- 2 Eljedi A, Mikolajczyk RT, Kraemer A, Laaser U. Health-related quality of life in diabetic patients and controls without diabetes in refugee camps in the Gaza strip: a cross-sectional study. *BMC Public Health* 2006; **6**: 268.
- 3 Khader A, Ballout G, Shahin Y, et al. Diabetes mellitus and treatment outcomes in Palestine refugees in UNRWA primary healthcare clinics in Jordan. *Public Health Action* 2013; **3**: 259–64.
- 4 Khader A, Farajallah L, Shahin Y, et al. Cohort monitoring of persons with diabetes mellitus in a primary healthcare clinic for Palestine refugees in Jordan. *Trop Med Int Health* 2012; **17**: 1569–76.
- 5 Shahin Y KA, Khader A, Zeidan W, Harries AD, Nerup J, Seita A. Clinical audit on the provision of diabetes care in the primary care setting by United Nations Relief and Works Agency for Palestine refugees in the near east (UNRWA). *J Diabetes Mellitus* 2015; **5**: 12–20.
- 6 Shamsi HGH. Prevalence, management and control of diabetes mellitus among Syrian refugees in Duhok governorate, Kurdistan region of Iraq – a cross sectional study in the camp of Domiz 1. MSc thesis, Lithuanian University of Health Sciences, 2017.
- 7 Kehlenbrink S, Jaacks LM, on behalf of the Boston Declaration signatories. Diabetes in humanitarian crises: the Boston Declaration. *Lancet Diabetes Endocrinol* 2019; **7**: 590–92.

The causal influence of maternal obesity on preterm birth

Preterm birth is the most common cause of death in infants worldwide, but the cause of preterm birth is often unknown.¹ Among other

risk factors—such as high blood pressure, being pregnant with more than one baby, and some vaginal infections—maternal obesity has been associated with preterm birth.² Maternal obesity increases the risk of gestational diabetes and hypertensive disorders that contribute to medically indicated preterm birth.

A large cohort study by Liu and colleagues³ reported a statistically significant association between pre-pregnancy obesity and increased risk of preterm birth. However, the study is based on observational data, and Yuan and Niu⁴ argued that periodontitis and depression might be unobserved confounders that reduce the translatability of the evidence. In their reply, Liu and colleagues⁵ reject these confounding factors by referring to previous literature. However, one major problem remains: causal inferences are difficult to make from observational evidence because of reverse causation and residual confounding.

To investigate whether the association between obesity and preterm birth is causal, we used Mendelian randomisation analysis. The Mendelian randomisation analysis approach can provide proof of the comparative causal effects by using single nucleotide polymorphisms (SNPs) as proxies for a trait. The random segregation of alleles at the creation of germ cells (Mendel's first law), the independent assortment of alleles with regard to the remainder of the genome (Mendel's second law), and the SNPs' unaffectedness by environmental and lifestyle factors, result in genetic variations that are mainly unrelated to unmeasured confounders and reverse causation.⁶ We applied two-sample Mendelian randomisation analysis using available summary statistics on SNP-risk factor and SNP-outcome associations from two separate genome-wide association studies (GWAS) for large numbers of uncorrelated variants to investigate the causal relation



Published Online
December 20, 2019
[https://doi.org/10.1016/S2213-8587\(19\)30406-1](https://doi.org/10.1016/S2213-8587(19)30406-1)