Surgery for diabetes in low and middle-income countries

By the time JM is assessed by a surgeon, the cellulitis has already reached mid-calf and she has clear signs of sepsis. What began as a minor injury to her left large toe has quickly evolved into infection and necrosis, precipitated by her circumstances. She has been unable to afford the insulin she needs for her type 2 diabetes for almost 3 months, and has never had or been taught about appropriate foot care. The remainder of her hospital stay is fraught with difficulties that are taught about appropriate foot care. The remainder of her hospital stay is fraught with difficulties that are common in low-income and middle-income countries (LMICs), such as the one where she lives.

The next day, surgery scheduled to treat her infected toe is cancelled because of her low haemoglobin, but she cannot receive a transfusion because no blood is available and her relatives are also anaemic. After 2 days of waiting, a decision is made to proceed with debridement under local anaesthesia, but continuing problems with electricity and staffing increase delays. When she is finally taken to the operating theatre, surgeons discover that the entire foot is necrotic and can no longer be salvaged. JM urgently needs amputation and is rapidly going into septic shock, but she defers the decision until her husband is present. She eventually undergoes an above-knee amputation but, despite best efforts, ultimately succumbs to overwhelming sepsis and renal failure one week later. She is 42 years old. Her two small children, who have been sleeping under her hospital bed throughout her stay, depart the next day with her husband.

Life-threatening complications of diabetes are common in LMICs. Findings of a 2012 large-scale multicentre, multi-national study from sub-Saharan Africa showed a high prevalence (48%) of peripheral neuropathy compared with high-income settings (27%). In LMICs, peripheral neuropathy (rather than peripheral vascular disease, as in high-income countries) is most closely associated with the increased prevalence of diabetic foot lesions, and strongly affects the timing and severity of disease presentation. Reports from Africa have shown the prevalence of diabetic foot ulceration is as high as 15%, much higher than the roughly 1% found in North America and Europe.

These high rates of neuropathy and foot ulceration are complicated by deficiencies in the health-care system and especially the delivery of surgical care. Structural factors such as inadequate facilities, few skilled practitioners, and scarce availability of drugs and other treatment options combine to result in less than optimum care. Additionally, patient factors such as low socioeconomic status, poor diabetes education (including proper preventive hygiene and foot care), long travel distances to health facilities, financial restrictions, insufficient awareness about the urgent need to seek care, and the reluctance of both patients and practitioners to undertake surgery, all contribute to substantial delays and advanced severity of disease at the time of presentation and treatment. Even with adequate access to education and treatment, foot ulceration might still arise frequently because of longstanding glycaemic burden.

Unfortunately, these late stages of disease are often accompanied by diabetes-related infections ranging from wound and soft tissue infections to septicemia. Not only do these infections carry substantial morbidity, they are also one of the main causes of death in patients with diabetes. To be properly treated, these patients need urgent or emergent surgical intervention. Whether intervention includes aggressive debridement or limb amputation, surgery is necessary to control the spread of infection and prevent unnecessary and avoidable premature deaths. In a study by Gulam-Abbas and colleagues in a population of in-patients with diabetes in a hospital in Tanzania, those with advanced ulcers who did not undergo surgery were found to have the
highest rate (54%) of mortality. Despite these and other similar findings, delays in even minor surgical interventions often happen in LMICs. The incredible dearth of adequate surgical care means that even if the aforementioned barriers are overcome, the chance of a patient obtaining care in a timely and affordable way is very small.

In an ideal world, surgical intervention would be a very small part of diabetes care. But the world of most people with diabetes is not ideal. The reality is one in which restricted preventive and treatment services exist. In these settings, access to surgical care and prompt surgical intervention is essential to reduce and prevent patient morbidity and mortality related to lower extremity complications. In the context of health systems strengthening and as an integral part of the multidisciplinary approach to the management of diabetes, improved surgical systems are urgently needed. Therefore, we advocate to those tackling the task of reducing the burden of diabetes to consider the role of surgery in mitigating the outcomes of restricted care, and to prevent further adding to the burden of unnecessary deaths, such as JM’s, that many countries cannot afford.

Ainhoa Costas-Chavarri, *Rowan Gillies
Programme in Global Surgery and Social Change, Harvard Medical School, Boston, MA 02115, USA (RG); Programme in Global Surgery and Social Change, Human Resources for Health, Rwanda (AC-C)
rowangillies@yahoo.com.au

We declare that we have no competing interests. We thank David L Osterbur (Countway Library of Medicine, Harvard Medical School, MA, USA) for invaluable support with the literature search.

In the absence of a fully developed public-health infrastructure, primary clinicians struggle to effect health-care improvements in the UAE. Reliable baseline and comparative data are essential for the development of effective health programmes and services, and for review and evaluation of the effectiveness of interventions. Systematic collection and initial analysis of data have been important priorities associated with the development of a research programme focused on the prevention and management of diabetes and associated NCDs. In Abu Dhabi and the rest of the UAE, however, the sourcing of reliable data has proved particularly challenging, as substantial gaps exist in published demographic and health status data. To address this gap, the support and collaboration of key UAE-based health service agencies is crucial to enhance access to unpublished data and grey literature. Access to such data has the potential to improve knowledge and understanding of the true nature and extent of the

Diabetes in the United Arab Emirates: the need for valid datasets for health service planning

In 2013, the age-standardised comparative prevalence of diabetes in the United Arab Emirates (UAE) was 18·98%, amongst the highest in the world; the global comparative prevalence in 2013 was 8·3%. Recent research and anecdotal reports from clinicians point out that Abu Dhabi, in particular, is burdened by high and rising rates of diabetes, obesity, and non-communicable diseases (NCDs) related to diabetes.

Abu Dhabi and the UAE generally have unusual subpopulation distributions, with a known population imbalance resulting from a large, young, male immigrant labour force. Although these expatriate workers tend to return home before age-related health issues, such as diabetes, become evident, their dietary preferences contribute substantially to the changing dietary patterns in the UAE.

In the absence of a fully developed public-health workforce and services and community support