



Diabetic Foot: It's Time to Share the Burden

Devender Singh

Diabetes currently affects more than 194 million people worldwide and is expected to reach 333 million by 2025, with the maximum burdens falling upon developing countries. India considered as the “Diabetic capital of the world,” and alone currently counts over 35 million people harbouring diabetes.¹⁾ This is estimated to reach 73.5 million by 2025 as a consequence of longer life expectancy, sedentary lifestyle and changing dietary patterns.²⁾

Because of the universal availability of insulin and the sophistication of modern therapy, they no longer succumb from coma or starvation but survive into adulthood to develop the late complications of diabetes: retinopathy, nephropathy, neuropathy and peripheral vascular diseases. One of the most common complications of diabetes in the lower extremity is the diabetic foot ulcer which is often ignored. It is estimated that 15% of patients with diabetes will develop a lower extremity ulcer during the course of their disease.³⁾ Worldwide there are more than one million amputations every year with up to 70% of these amputations related to diabetes. Not only is the impact of amputation devastating to people's lives, it is also one of the most costly complications, as foot problems are the commonest cause of hospital admissions for people with diabetes.⁴⁾ It has been estimated that the foot problems consume as much as 40% of scarce healthcare resources in some developing countries. Diabetic patients are 17 times more likely to develop gangrene of the foot than are persons without diabetes, and gangrene of the lower extremities occurs in 20–30% of patients with maturity onset diabetes.⁵⁾

The yearly risk of major amputation in patients with diabetes is approximately 5 to 6 times that of a non-diabetic person which is 6.5% per year. A person whose diabetes is recognized in his teens has a substantial chance of requiring a major amputation by the time he reaches his fiftieth year. The remaining limb in a diabetic patient who has one amputation is also at considerable jeopardy, and 30% to 40% of the patients with diabetes who have had one amputation will require a contralateral amputation within 3 years.⁶⁾ Not only that, the one year mortality after lower limb extremity amputation of 11–41%, increases to 20–50% and 39–68% after 3 and 5 years respectively.⁷⁾

Fifteen years have elapsed since the St Vincent Declaration set a 50% reduction of lower limb amputations as a principal target in patients with diabetes, yet the situation worldwide is still far from target.⁸⁾ Indeed, every 30 seconds a lower limb is lost due to diabetes somewhere in the world.⁹⁾ This is really scary, especially because we are little aware of it.

Three great pathologies come together in the diabetic foot, neuropathy, ischemia and infection, leading to an inexorable situation that defeats every health system in the world. Although significant progress has been accomplished due to casting and better wound care in the neuropathic ulcer, about one third to half of patients still may fail to heal.¹⁰⁾ Revascularization procedures (bypass surgery and angioplasty) have made substantial improvement possible in the management of the neuro ischemic foot, as well.¹¹⁾ Nevertheless, these procedures are very demanding and are not widely available throughout the world.⁹⁾ While it is true that newer modalities of investigations like magnetic resonance imaging, magnetic resonance angiography,¹²⁾ and novel higher

Department of Vascular and Endovascular Surgery, Nizam's Institute of Medical Sciences, Hyderabad, India

antibiotics, are now providing further possible solutions to the challenges posed by the diagnosis and management of foot infections.¹³⁾ But in spite of this the threat of MRSA (methicillin-resistant staphylococcus aureus) and ESBL (extended spectrum beta lactamase) continues to be alarming.¹⁴⁾

Where do we stand and where are we going? This question remains still unanswered, particularly in developing countries. Patients are confused where to go, physicians do not know to whom they should refer, general surgeon thinks, vascular surgeons are the best person to treat them, but vascular surgeon feels if there is no vasculopathy, they have hardly anything to offer them. Then who will take the brunt of the situation.....

Probably the answer to above problem is—a multidisciplinary approach, wherein patient himself plays a key role.

The foot problem in diabetic is multifaceted and there are no simple solutions. In all these patients the primary physician or the community care provider becomes the hub of the management. It is important to win the patients confidence at the primary level. There are myths and misgivings about the management of the foot problems, which many a time is responsible for gangrene of foot from the very salvageable foot at risk. The gloomy picture can be changed to some extent if the primary practitioner has some special interest in diabetes and foot care. We need effective education of the general diabetic population about the measures of self care that are indispensable to achieve both primary and secondary interventions.¹⁵⁾ It is high time to have wider availability of podiatric education and multidisciplinary foot clinics. It is estimated that reductions in amputations rates between 45% and 85% can be achieved through the adoption and implementation of well organized diabetic foot care teams. This initiative must be reimbursed by national governments, who urgently need to be persuaded that the approach has been documented and proved to be cost effective.⁹⁾ Lastly better understanding of the pathophysiology of the diabetic foot is essential; also we need to understand why diabetic foot is so susceptible to infection, so that we may improve management of infection, especially in the ischaemic foot.¹⁵⁾

In conclusion, diabetics are victims of a number of problems specific to their disease that result in an augmented amputation rates from the complications of neuropathy and

infection. Patient education and understanding of the nature and treatment of neuropathic complications on the part of physician can avert many of these complications. In this context, more forceful implementation of novel therapeutic strategies, wider availability of multidisciplinary foot care teams, as well as improvement of scientific research are urgently needed in order to reduce the burden of foot complications.

References

- 1) King, H., Aubert, R. E., Herman, W. H.: Global burden of diabetes, 1995-2025: prevalence, numerical estimates, and projections. *Diabetes Care* **21**: 1414-1431, 1998.
- 2) International Diabetes Federation: *Diabetes Atlas*, 2nd Ed., 2003.
- 3) Reiber, G. E.: The epidemiology of diabetic foot problems. *Diabet. Med.*, **13** (Suppl. 1): S6-S11, 1996.
- 4) Most, R. S. and Sinnock, P.: The epidemiology of lower extremity amputations in diabetic individuals. *Diabetes Care*, **6**: 87-91, 1983.
- 5) Trautner, C., Haastert, B., Giani, G., et al.: Incidence of lower limb amputations and diabetes. *Diabetes Care*, **19**: 1006-1009, 1996.
- 6) Apelqvist, J., Larsson, J. and Agardh, C. D.: Long-term prognosis for diabetic patients with foot ulcers. *J. Intern. Med.*, **233**: 485-491, 1993.
- 7) Apelqvist, J., Ragnarson-Tennvall, G., Persson, U., et al.: Diabetic foot ulcers in a multidisciplinary setting. An economic analysis of primary healing and healing with amputation. *J. Intern. Med.*, **235**: 463-471, 1994.
- 8) Diabetes care and research in Europe: the Saint Vincent declaration. Workshop Report. *Diabet. Med.*, **7**: 360, 1990.
- 9) International Diabetes Federation and International Working Group of the Diabetic Foot. Time to act. The Netherlands, 2005.
- 10) Margolis, D. J., Allen-Taylor, L., Hoffstad, O., et al.: Healing diabetic neuropathic foot ulcers: are we getting better? *Diabet. Med.*, **22**: 172-176, 2005.
- 11) Sumpio, B. E., Lee, T., and Blume, P. A.: Vascular evaluation and arterial reconstruction of the diabetic foot. *Clin. Podiatr. Med. Surg.*, **20**: 689-708, 2003.
- 12) Chatha, D. S., Cunningham, P. M. and Schweitzer, M. E.: MR imaging of the diabetic foot: diagnostic challenges. *Radiol. Clin. North Am.*, **43**: 747-759, 2005.
- 13) Armstrong, D. G. and Lipsky, B. A.: Advances in the treatment of diabetic foot infections. *Diabetes Technol. Ther.*, **6**: 167-177, 2004.
- 14) Dang, C. N., Prasad, Y. D., Boulton, A. J., et al.: Methicillin-resistant staphylococcus aureus in the diabetic foot clinic: a worsening problem. *Diabet. Med.*, **20**: 159-161, 2003.
- 15) Edmonds, M. E.: The diabetic foot, 2003. *Diabetes Metab. Res. Rev.*, **20** (Suppl. 1): S9-S12, 2004.