The diabetes epidemic: addressing diagnostic and therapeutic challenges

"Diabetes not only represents a public health problem with increased cardiovascular disease morbidity and mortality, but also poses major economic challenges for healthcare systems around the globe."

Samy I McFarlane

Author for correspondence:
Division of Endocrinology, Medical Director of Clinical Research, College of Medicine, State University of New York – Downstate Medical Center, 450 Clarkson Avenue, Box 50, Brooklyn, NY 11203, USA
Tel.: +1 718 270 3711
Fax: +1 718 270 6358
smcfarlane@downstate.edu

Gul Bahtiyar

Woodhull Medical Center, NYU School of Medicine, NY, USA

Diabetes mellitus (DM) has become the modern-time epidemic that continues to increase rapidly, affecting millions of people around the globe [1–7]. In the USA, the number of adults who reported having been diagnosed with DM was 9.9% in the year 2009, adding to this figure the substantial number of cases of undiagnosed diabetes, this number approaches 14% of the population and is projected to be 33% by the year 2050 [8]. Worldwide, over 285 million people have diabetes, with projected increase to 366 million diabetics by the year 2030 [7]. Diabetes not only represents a public health problem with increased cardiovascular disease (CVD) morbidity and mortality, but also poses major economic challenges for healthcare systems around the globe. In the USA, for example, in 2007 diabetes-related costs amounted to US$253 billion, including direct medical cost and indirect costs such as absenteeism, loss of productivity and early mortality [7].

Healthcare providers are faced with major challenges in diagnosis and management of diabetes and its complications, particularly early recognition of chronic kidney disease, the main cause of end-stage renal disease and renal replacement therapy, and a major contributor to early mortality from CVD in the diabetic population [9–11].

In this themed issue of *Therapy,* we discuss selected 'hot topics', addressing therapeutic and diagnostic challenges as well as opportunities for CVD risk reduction. These articles are written by scholars with particular expertise and insights in the field. In this issue, the Heinz Drexel group discuss in a comprehensive review the current evidence for combination lipid therapy in people with diabetes [12]. While statins are a well-established, lipid-lowering therapy for people with diabetes that is associated with CVD risk reduction as well as pleotropic effects above and beyond lipid lowering [13], residual CVD risk remains unacceptably high in the diabetic population despite statin therapy [14]. Therefore, combination lipid-lowering therapy addressed in this issue by Drexel *et al.* appears to be a logical option in this high CVD risk diabetic population.

Obesity remains one of the major risk factor for diabetes and CVD with up to 90% of diabetic patients being overweight or obese at diagnosis [15]. These patients generally continue to gain weight throughout the course of their illness in a way that seems inevitable [16] and thus enter into a vicious cycle of weight gain and poor glycemic control. Ironically, some of the major therapeutic agents for diabetes, such as insulin, as well as oral antidiabetic agents, such as sulfonylureas, lead to substantial weight gain with potential perpetuation of such a vicious cycle of weight gain and poor glucose control, sending the wrong message to patients who are often asked to lose weight. This therapeutic dilemma is addressed in a review by our group providing insights into weight gain associated with insulin therapy and highlighting therapeutic strategies that could potentially mitigate weight gain associated with such therapy [17].

Complementary to our article is the special report by Sonnett *et al.* on incretin-based therapies and their future in Type 2 diabetes [18]. These agents, contrary to insulin, sulfonylureas and thizolidinediones, are associated with substantial weight loss, such as the case with GLP-1 agonists including exenatide and liraglutide, or at least weight neutral, as with the DPP IV inhibitors sitagliptine and saxagliptine. Beneficial weight effects make these agents attractive options in Type 2 diabetes where the majority of patients are obese [19]. In fact, this feature prompted the endorsement of early introduction of these agents for the treatment of Type 2 diabetes [20]. Future implications of these therapeutic agents are addressed in the special report in this issue [18].

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Finally, in a review of cutting-edge information, the Whaley-Connell group presents an insightful discussion on the role of novel biomarkers in diagnosis of early diabetic kidney injury [21]. The use of these markers, including neutrophil glutinase-associated lipoprotein, kidney injury module-1 and podocin might lead to early recognition and treatment of diabetic kidney disease, therefore preventing one of the major complications of diabetes.

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