Part 1 Introduction to diabetes

Chapter 1

Introduction to diabetes

KEY POINTS

- Diabetes is common and its incidence is rising.
- Type 2 diabetes is by far the most common accounting for 85–95% of cases.
- Complications in the microvasculature (eye, kidney and nerve) and the macrovasculature are responsible for considerable morbidity and excess mortality.

Diabetes mellitus is a condition of chronically elevated blood glucose concentrations which give rise to its main symptom of passing large quantities of sweet-tasting urine (*diabetes* from the Greek word meaning 'a siphon', as the body acts as a conduit for the excess fluid, and *mellitus* from the Greek and Latin for honey). The fundamental underlying abnormality is a net (relative or absent) deficiency of the hormone insulin. Insulin is essentially the only hormone that can lower blood glucose.

There are two categories of diabetes: type 1 is caused by an autoimmune destruction of the insulin-producing β cell of the islets of Langerhans in the pancreas (absolute deficiency); and type 2 is a result of both impaired insulin secretion and resistance to its action – often secondary to obesity (relative deficiency).

The precise level of blood glucose that defines diabetes has been revised several times and is covered in more detail in Chapter 3. Diabetes is common and is becoming more common. Age-adjusted prevalence is set to rise from 5.9% to 7.1% (246–380 million) worldwide in the 20–79 year age group, a 55% increase (Figure 1.1). The relative proportions of type 1 to type 2 vary from 15:85 for Western populations to 5:95 in developing countries.

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It is the short- and long-term complications of diabetes which make it a major public health problem. Absolute deficiency of insulin leads to ketoacidosis and coma with an appreciable mortality even in the UK and other Western countries. Hyperglycaemic hyperosmolar coma (now called hyperglycaemic hyperosmolar state) is less common and more insidious but remains an equally serious problem for people with type 2 diabetes (see Chapter 12).

Long-term hyperglycaemia affects the microvasculature of the eye, kidney and nerve as well as the larger arteries, leading to accelerated atherosclerosis. Diabetes is the most common cause of blindness in those of working age, the most common single cause of end-stage renal failure worldwide, and the consequences of neuropathy make it the most common cause of non-traumatic lower limb amputation. Mortality from ischaemic heart disease and stroke is 2–4-fold higher than in the age- and sex-matched non-diabetic population. All these important clinical problems will be covered in detail in subsequent chapters (Figure 1.2).

This handbook sets out to cover the essentials of diagnosis, epidemiology and management of diabetes and its distressingly many complications. By using case vignettes and summaries of key trials together with web links and suggestions for further reading, it will serve as a useful desktop reference for all healthcare professionals who provide diabetes care.

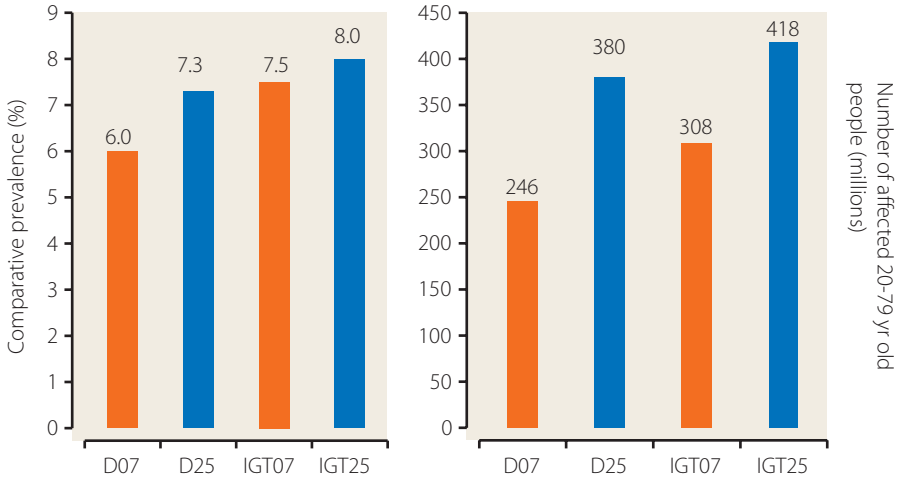

Figure 1.1 Estimated comparative prevalence (age adjusted) of diabetes and impaired glucose tolerance (IGT) together with numbers affected for the global population age 20–79 years for 2007 (red) and 2025 (blue). Data from *Diabetes Atlas*, 3rd edn, International Diabetes Federation.

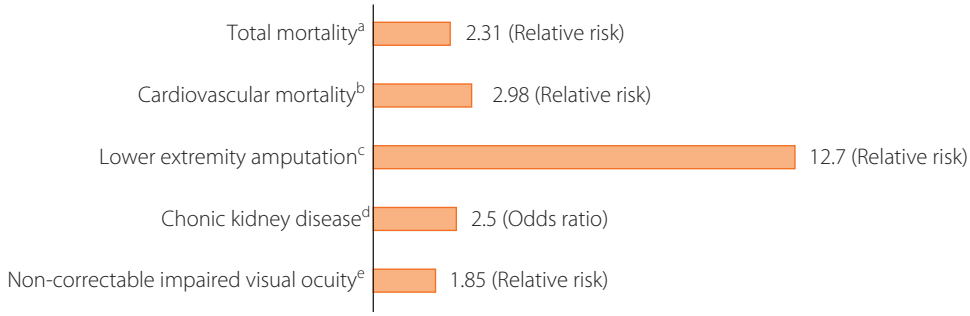

Figure 1.2 Rates of major complications of diabetes for the US population derived from NHANES or Medicare data. [a]NHANES data 1988–2000; [b]Medicare population Minnesota 1993–5; [c]NHANES data, 1999–2006 (chronic kidney disease defined as estimated GFR <60 mL/min/1.73 m^2.); [d]NHANES data, 1999–2002.

FURTHER READING

International Diabetes Federation. *Diabetes Atlas*, 4th edn. Brussels: International Diabetes Federation, 2009.

KEY WEBSITE

- Diabetes Atlas: www.eatlas.idf.org