

Chapter 41

Introduction: Type-2 Diabetes

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There are over 25 million people in the USA with diabetes, representing 8.3 % of the US population. The worldwide prevalence of diabetes was 347 million in 2010 and it is estimated to rise to 439 million by 2030. This diabetes epidemic can be largely attributed to rise in worldwide obesity [1].

Type-2 diabetes is characterized by insulin resistance and progressive beta cell failure. Obesity is associated with the state of insulin resistance seen in diabetes. The underlying metabolic abnormalities that lead to the development of insulin resistance in obese individuals are poorly understood. Accumulation of lipids in liver and skeletal muscle may play a contributing role. Beta cell failure (decrease beta cell mass and beta cell dysfunction) may also occur in genetically susceptible individuals [2].

Type-2 diabetes is associated with a number of microvascular and macrovascular complications and is the most common cause of chronic renal failure and blindness in US adults. The risk of coronary artery disease and stroke is 2–4 times higher in patients with diabetes as compared to nondiabetic individuals; macrovascular complications are the leading cause of death.

Aggressive glycemic control has been shown to decrease microvascular complications in patients with both type-1 and type-2 diabetes [3–5]. Tight glycemic control has also been shown to improve macrovascular complications in patients with type-1 diabetes [6]. However, clinical trials have thus far been inconclusive on the potential benefits of intensive glycemic control on the development macrovascular complications in patients with type-2 diabetes. Treatment of cardiovascular risk factors such as HTN and dyslipidemia may be more important for the prevention of vascular complications in patients with type-2 diabetes [7].

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Over the past decade, there has been a rapid growth in the number of type of therapeutic modalities designed to treat hyperglycemia. However, lifestyle modification, including dietary recommendations to promote weight loss in overweight and obese individuals and increased physical activity, forms the foundation in the management of patients with type-2 diabetes [8, 9]. Over 80 % of patients with type-2 diabetes are obese. A modest weight loss of approximately 4 kg has been associated with significant improvement in insulin sensitivity and glycemic control [10, 11]. Moreover, weight loss associated with gastric bypass surgery has recently been shown to significantly improve glycemic control in patients with diabetes [12, 13].

The cases described in this chapter present three clinical scenarios that allow for discussion of areas critical to type-2 diabetes management. Within the context of pertinent clinical practice guidelines, glycemic goals, medication classes, transition to insulin therapy, and risk factor modification are all emphasized. In particular, we stress the importance of empowering patients, individualizing treatment goals, and tailoring pharmacologic therapies based on contemporary approaches to patient-centered diabetes care [14].

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