

# Management of Hypertension in Patients with Diabetes

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## KEYWORDS

• Diabetes • Hypertension • Cardiovascular disease • Antihypertension medication

## KEY POINTS

- Hypertension is a major contributing factor to the development of cardiovascular disease, especially in patients with diabetes.
- The management of hypertension in patients with diabetes is equally important as glucose control in the prevention of long-term diabetes complications.
- It is important to treat patients with hypertension who have diabetes according to evidence-based medicine and national guidelines.

## INTRODUCTION

Mortality from cardiovascular disease is 2 to 4 times higher in patients with type 2 diabetes compared with patients with similar demographic characteristics but without diabetes.<sup>1</sup> Hypertension is a major contributing factor to the development of cardiovascular disease. The management of hypertension in patients with diabetes is as important as glucose control to the prevention and management of long-term diabetes complications. This article discusses the incidence of hypertension in diabetes, the impact of hypertension on the development of long-term complications, diagnosis of hypertension in patients with diabetes, blood pressure goals, the treatment of hypertension in patients with diabetes, and antihypertension medications.

## INCIDENCE OF HYPERTENSION IN DIABETES

According to the American Diabetes Association, 2 out of 3 adults with diabetes have high blood pressure.<sup>1</sup> The incidence and presentation of hypertension is different in patients with type 1 diabetes compared with type 2 diabetes.<sup>2</sup> In patients with type 1 diabetes, hypertension is usually the result of underlying nephropathy, whereas patients with type 2 diabetes usually have hypertension that coexists with other

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cardiometabolic risk factors. Patients with type 1 diabetes generally develop hypertension after several years of having the disease. The incidence of hypertension in patients with type 1 diabetes is 5% after having the disease for 10 years; after 20 years, the incidence increases to 33%; and after 40 years, the incidence increases to 70%.<sup>3</sup> The incidence of hypertension in patients with type 2 diabetes is 1.5 to 3 times higher than in people without diabetes in age-matched groups.<sup>2</sup>

### THE IMPACT OF HYPERTENSION ON THE DEVELOPMENT OF LONG-TERM DIABETES COMPLICATIONS

Hypertension is a major contributor for cardiovascular events including myocardial infarction and stroke.<sup>3</sup> It is also a risk factor for microvascular complications including retinopathy and nephropathy. Cardiovascular disease is the most common cause of death in patients with diabetes. It is thought to account for 86% of all deaths of patients with diabetes. See **Box 1** for the major cardiovascular risk factors in patients with diabetes. An increase in diastolic or systolic blood pressure of 5 mm Hg is associated with a concomitant increase in cardiovascular disease of 20% to 30%. If the diastolic blood pressure is greater than 70 mm Hg, retinopathy progresses at a faster rate.

Hypertension is approximately 2 times higher in patients with diabetes compared with patients without diabetes.<sup>4</sup> In patients with diabetes, 75% of all cardiovascular disease is attributable to hypertension. The current recommendation is to reduce blood pressure to less than 130/85 mm Hg.

The risk factors for the development of hypertension in patients with diabetes include the development of diabetic nephropathy, hyperinsulinemia, extracellular fluid volume expansion, and increased arterial stiffness. Microalbuminuria and macroalbuminuria is a risk factor for the development of hypertension in patients with type 1 diabetes. A study of 981 patients with type 1 diabetes for 5 or more years showed that hypertension was present in 19% of patients with normoalbuminuria, 30% of patients with microalbuminuria, and 65% of patients with macroalbuminuria.<sup>5</sup> The incidence of

#### Box 1

##### Major cardiovascular risk factors in patients with diabetes

- Hypertension
- Age (older than 55 years for men, 65 years for women)
- Diabetes mellitus
- Increased low-density lipoprotein (LDL)
- Increased total cholesterol,
- Low high-density lipoprotein (HDL) cholesterol
- Estimated glomerular filtration rate (eGFR) less than 60 mL/min
- Family history of premature cardiovascular disease (men less than 55 years of age or women less than 65 years of age)
- Microalbuminuria
- Obesity (body mass index [BMI] >30 kg/m<sup>2</sup>)
- Physical inactivity
- Tobacco usage, particularly cigarettes

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