

Hypertension in Diabetes Study (HDS):

I. Prevalence of hypertension in newly presenting type 2 diabetic patients and the association with risk factors for cardiovascular and diabetic complications

The Hypertension in Diabetes Study Group

Objective: To determine the prevalence of hypertension in newly diagnosed type 2 diabetic patients and its association with risk factors for cardiovascular and diabetic complications.

Design: Cross-sectional study.

Patients: Newly diagnosed type 2 diabetic patients (n = 3648, mean age 52 years, 59% male) recruited for the UK Prospective Diabetes Study (UKPDS).

Measurements: Blood pressure, body mass index, waist:hip ratio, ECG signs of ischaemia and of left ventricular hypertrophy (Minnesota code), fasting plasma glucose, urate, creatinine, insulin, triglycerides, high-density lipoprotein-, low-density lipoprotein- and total cholesterol, urinary albumin:creatinine ratio, retinopathy grading.

Results: Thirty-nine per cent of the patients (35% of the males, 46% of the females) were hypertensive (mean blood pressure ≥ 160 systolic and/or ≥ 90 mmHg diastolic 2 and 9 months after diagnosis of diabetes, or taking antihypertensive therapy). The hypertensive patients had a greater mean body mass index (30.1 versus 28.0 kg/m², $P < 0.0001$) than the normotensive patients. They also had higher fasting plasma triglyceride (1.94 versus 1.69 mmol/l, $P < 0.0001$) and insulin (15.0 versus 12.8 mU/l, $P < 0.0001$) levels but these associations disappeared or weakened when obesity was taken into account. Hypertensive compared with normotensive subjects suffered a higher prevalence of cardiovascular events before the diagnosis of diabetes (4.8 versus 2.5%, $P < 0.0001$), of microalbuminuria (albumin:creatinine ratio > 5.0 g/mol; 24 versus 14%, $P < 0.0001$), of ECG signs of probable and possible ischaemia (24 versus 14%, $P < 0.0001$) and of left ventricular hypertrophy (8.5 versus 3.8%; $P < 0.0001$). The prevalence of retinopathy was similar in the two groups.

Conclusions: Hypertension is common in newly diagnosed type 2 diabetes and is associated with obesity. The association between hypertension and higher triglyceride and insulin levels may be secondary to obesity in this population. An association between hypertension and cardiovascular complications is already apparent at diagnosis of diabetes.

Journal of Hypertension 1993, 11:309–317

Keywords: Type 2 diabetes, hypertension, antihypertensive therapy, ECG, triglyceride, high-density lipoprotein-cholesterol, insulin, urate, epidemiology, UK Prospective Diabetes Study.