

Hypertension in Diabetes Study (HDS):

II. Increased risk of cardiovascular complications in hypertensive type 2 diabetic patients

The Hypertension in Diabetes Study Group

Objective: To determine the degree to which hypertension is a risk factor for macrovascular and microvascular complications in type 2 diabetes.

Design: Observational prospective study.

Subjects: Newly diagnosed Type 2 diabetic patients recruited into the UK Prospective Diabetes Study (n = 3648; mean age 52 years), 40% of whom were hypertensive (blood pressure ≥ 160 mmHg systolic and/or ≥ 90 mmHg diastolic or already being treated for hypertension).

Measurements: The incidence of fatal and non-fatal major diabetes- and hypertension-related clinical events was determined over a median of 4.6 years' follow-up. The 3-year change in prevalence of subclinical indices of macrovascular and microvascular disease was assessed, including ECG abnormalities (Minnesota coding), left ventricular hypertrophy (ECG and chest x-ray), microalbuminuria (albumin/creatinine ratio) and moderately severe retinopathy (grading of retinal photographs).

Results: The hypertensive patients had (1) a greater incidence than normotensive patients of death from diabetes-related, mainly cardiovascular events (age-adjusted odds ratio 1.82) and (2) a greater incidence of diabetes-related death and major morbidity combined, including myocardial infarctions, angina, strokes and amputation (age-adjusted odds ratio 1.56). These associations were still present after allowance for other risk factors present at the time diabetes was diagnosed. The change in the prevalence of microvascular disease over 3 years was similar in both hypertensive and normotensive subjects.

Conclusions: Hypertension is a major risk factor for cardiovascular morbidity and mortality in type 2 diabetes. Comparison with other studies suggests that patients with both hypertension and diabetes have approximately four times the cardiovascular risk of non-diabetic non-hypertensive subjects. Antihypertensive therapy may provide greater benefit in this high-risk group than in the general population.

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Keywords: Type 2 diabetes, hypertension, complications, cardiovascular disease, UK Prospective Diabetes Study.