

Outcomes in treated hypertensive men – a follow-up during three decades.

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This thesis is based on the following papers:

- I Andersson OK, Almgren T, Persson B, Samuelsson O, Hedner T, Wilhelmsen L.
Survival in treated hypertension: follow up study after two decades.
BMJ 1998;317:167-171.
- II Almgren T, Persson B, Wilhelmsen L, Rosengren A, Andersson OK.
Stroke and coronary heart disease in treated hypertension –
a prospective cohort study over three decades.
J Intern med 2005;257:496-502.
- III Almgren T, Wilhelmsen L, Samuelsson O, Himmelmann A, Rosengren A, Andersson OK.
Diabetes in treated hypertension is common and carries
a high cardiovascular risk: results from a 28-year follow-up.
J Hypertens 2007;25:in press.
- IV Almgren T, Himmelmann A, Herlitz H, Fägerlind M, Widgren BR, Wilhelmsen L, Andersson OK.
Systolic blood pressure rise in spite of therapy. Thirty years of follow-up in hypertensive
male patients without complications.
Submitted.



The Sahlgrenska Academy
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Objectives: To analyse survival, cause specific mortality and cardiovascular morbidity in relation to cardiovascular risk factors, to investigate the prevalence of type 2 diabetes and the cardiovascular risk this constitutes and to study systolic blood pressure over time in treated hypertensive men during three decades of follow-up.

Subjects and methods: 754 hypertensive men were identified at a screening in Göteborg of a randomly selected group of 10000 men, 47-54 years old, and were treated and followed with annual check-ups at an outpatient clinic during three decades.

Results: During 22-23 years 37 % of the hypertensive men died compared to 29 % of the non-hypertensive men. The impaired survival in hypertensive men escalated with time and was mainly due to a doubled incidence of death in ischemic heart disease; 20 % compared to 10 %. Smoking, S-cholesterol and target organ damage at entry and S-cholesterol during follow-up was related to a fatal or non-fatal myocardial infarction in the hypertensive men.

During 25-28 years 22 % of the hypertensive men had a fatal or nonfatal stroke compared to 13 % of the non-hypertensive men. Diabetes at entry and smoking at entry and during the study was significantly related to a first, fatal or non-fatal stroke in treated hypertensive men. The most prevalent cardiovascular complication was myocardial infarction that occurred in 33 % of the hypertensive men and in 22 % of the non-hypertensive subjects.

In the 725 hypertensive men with no diabetes at entry, 20.4 % (n=148) developed type 2 diabetes during 25 years. Body mass index, serum triglycerides and treatment with beta-blockers at entry were significantly related to new-onset diabetes. New-onset diabetes implied a significant increased risk for stroke (HR: 1.67; CI: 1.1-2.6), myocardial infarction (HR: 1.66; CI: 1.1-2.5) and mortality (HR: 1.42; CI: 1.1-1.9).

Systolic blood pressure increased 22.5 mmHg after 30 years from achieved blood pressure at the third annual check-up, in a 33 % randomly selected subgroup of treated hypertensive men free from cardiovascular disease. Systolic blood pressure increased 7.6 mmHg 30 years after screening in the randomly selected 3 % subgroup of the non-hypertensive men without current anti-hypertensive medication and free from cardiovascular disease. The difference in systolic blood pressure increment between treated hypertensive men and normotensive men was 15.0 mmHg (95 % CI: 7.7-22.2 mmHg).

Conclusions: Hypertensive men had an impaired survival and an excess of cardiovascular complications in spite of long-term treatment. They had an increased prevalence of diabetes and new-onset diabetes implied an increased risk of cardiovascular complications. In spite of treatment systolic blood pressure increased three times more than in non-hypertensive men.

Key words: hypertension, diabetes, drug treatment, stroke, myocardial infarction