



Cardiovascular prevention and blood pressure reduction: an overview of the outcome trials

J. A. Staessen, J. G. Wang and L. Thijs

Study Coordinating Centre. University of Leuven, B-3000 Leuven. Belgium.

In a quantitative overview of published trials, we investigated whether pharmacological properties of antihypertensive drugs or reduction of SBP explain CV outcomes in hypertensive or high-risk patients. We extracted summary statistics from published articles and computed pooled odds ratios for experimental vs reference treatment from stratified 2 x 2 contingency tables after application of Zelen's test of heterogeneity. Using meta-regression, we correlated across trials odds ratios with differences in SBP between study groups. In 9 recent trials, 62 605 hypertensive patients were randomised to initial treatment with older or newer drugs. Compared with diuretics and β -blockers, calcium-channel blockers and converting-enzyme inhibitors offered similar overall CV protection, but calcium-channel blockers provided more reduction in the risk of stroke (13.5%, 95% CI 1.3-24.2%, $p = 0.03$) and less reduction in the risk of MI (19.2%, 95% CI 3.5-37.3%, $p = 0.01$). Among these 9 trials, there was significant heterogeneity due to the higher risk of CV events on doxazosin in the ALLHAT trial and the higher risk of

stroke on captopril in the CAPPP study. However, in these 2 trials, the difference in SBP between the randomised groups was 2-3 mmHg. Similar SBP differences occurred in the NORDIL trial (diltiazem vs older drugs) and in 3 other trials (HOPE, PART2 and SCAT) testing a converting-enzyme inhibitor against placebo in high-risk patients. Metaregression across 27 trials (136 124 patients) showed that the observed odds ratios could be explained in terms of the achieved differences in SBP between study groups except for the NORDIL trial, in which the risk of stroke was lower on diltiazem despite a 3.1 mmHg higher SBP. The finding that in the reviewed trials BP reduction largely accounted for outcome emphasizes the desirability of blood pressure control. On average, all current antihypertensive drugs have similar long-term efficacy and safety. Calcium-channel blockers may be particularly effective in preventing stroke. The hypothesis that converting-enzyme inhibitors or β -blockers might influence CV prognosis over and beyond their antihypertensive effect remains unproved.