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[Intervention Review]

Beta-blockers for hypertension

Charles Shey Wiysonge[1], Hazel A Bradley[2], Jimmy Volmink[3,4], Bongani M Mayosi[5], Anthony Mbewu[6], Lionel H Opie[7]

[1]Division of Medical Microbiology & Institute of Infectious Disease and Molecular Medicine, University of Cape Town, Observatory, South Africa. [2]School of Public Health, University of the Western Cape, Cape Town, South Africa. [3]Faculty of Medicine and Health Sciences, Stellenbosch University, Tygerberg, South Africa. [4]South African Cochrane Centre, South African Medical Research Council, Tygerberg, South Africa. [5]Department of Medicine, J Floor, Old Groote Schuur Hospital, Cape Town, South Africa. [6]Department of Medicine, Faculty of Health Sciences, University of Cape Town, Cape Town, South Africa. [7]Hatter Cardiovascular Research Institute, Medical School, Cape Town, South Africa

Contact address: Charles Shey Wiysonge, Division of Medical Microbiology & Institute of Infectious Disease and Molecular Medicine, University of Cape Town, Anzio Road, Observatory, 7925, South Africa. charles.wiysonge@uct.ac.za. wiysonge@yahoo.com.

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ABSTRACT

Background

This review is an update of the Cochrane Review published in 2007, which assessed the role of beta-blockade as first-line therapy for hypertension.

Objectives

To quantify the effectiveness and safety of beta-blockers on morbidity and mortality endpoints in adults with hypertension.

Search methods

In December 2011 we searched the Cochrane Central Register of Controlled Trials, Medline, Embase, and reference lists of previous reviews; for eligible studies published since the previous search we conducted in May 2006.

Selection criteria

Randomised controlled trials (RCTs) of at least one year duration, which assessed the effects of beta-blockers compared to placebo or other drugs, as first-line therapy for hypertension, on mortality and morbidity in adults.

Data collection and analysis

We selected studies and extracted data in duplicate. We expressed study results as risk ratios (RR) with 95% confidence intervals (CI) and combined them using the fixed-effects or random-effects method, as appropriate.

Main results

We included 13 RCTs which compared beta-blockers to placebo (4 trials, N=23,613), diuretics (5 trials, N=18,241), calcium-channel blockers (CCBs: 4 trials, N=44,825), and renin-angiotensin system (RAS) inhibitors (3 trials, N=10,828). Three-quarters of the 40,245 participants on beta-blockers used atenolol. Most studies had a high risk of bias; resulting from various limitations in study design, conduct, and data analysis.

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Total mortality was not significantly different between beta-blockers and placebo (RR 0.99, 95%CI 0.88 to 1.11; I^2=0%), diuretics or RAS inhibitors, but was higher for beta-blockers compared to CCBs (RR 1.07, 95%CI 1.00 to 1.14; I^2=2%). Total cardiovascular disease (CVD) was lower for beta-blockers compared to placebo (RR 0.88, 95%CI 0.79 to 0.97; I^2=21%). This is primarily a reflection of the significant decrease in stroke (RR 0.80, 95%CI 0.66 to 0.96; I^2=0%), since there was no significant difference in coronary heart disease (CHD) between beta-blockers and placebo. There was no significant difference in withdrawals from assigned treatment due to adverse events between beta-blockers and placebo (RR 1.12, 95%CI 0.82 to 1.54; I^2=66%).

The effect of beta-blockers on CVD was significantly worse than that of CCBs (RR 1.18, 95%CI 1.08-1.29; I^2=0%), but was not different from that of diuretics or RAS inhibitors. In addition, there was an increase in stroke in beta-blockers compared to CCBs (RR 1.24, 95%CI 1.11-1.40; I^2=0%) and RAS inhibitors (RR 1.30, 95%CI 1.11 to 1.53; I^2=29%). However, CHD was not significantly different between beta-blockers and diuretics, CCBs or RAS inhibitors. Participants on beta-blockers were more likely to discontinue treatment due to adverse events than those on RAS inhibitors (RR 1.41, 95% CI 1.29 to 1.54; I^2=12%), but there was no significant difference with diuretics or CCBs.

Authors' conclusions

Initiating treatment of hypertension with beta-blockers leads to modest reductions in cardiovascular disease and no significant effects on mortality. These effects of beta-blockers are inferior to those of other antihypertensive drugs. The GRADE quality of this evidence is low, implying that the true effect of beta-blockers may be substantially different from the estimate of effects found in this review. Further research should be of high quality and should explore whether there are differences between different sub-types of beta-blockers or whether beta-blockers have differential effects on younger and elderly patients.

PLAIN LANGUAGE SUMMARY

Beta-blockers for hypertension

Beta-blockers are not recommended as first line treatment for hypertension as compared to placebo due to their modest effect on stroke and no significant reduction in mortality or coronary heart disease. We asked whether this class of drugs was as good as other classes in preventing death, stroke and heart attacks associated with elevated blood pressure. Thirteen randomised controlled trials suggested that first-line beta-blockers for elevated blood pressure were not as good at decreasing mortality and morbidity as other classes of drugs: diuretics, calcium channel blockers, and renin angiotensin system inhibitors.

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