

## Evidence Assessment: Summary of a Systematic Review

### Who is this summary for?

For Doctors and Health Personal, Administrators and Managers of health facilities and the stakeholders involved in prevention of non-communicable diseases.

## Beta-blockers for hypertension

### Key findings

- Beta-blockers probably make little or no difference in the number of deaths among people on treatment for high blood pressure;
- Beta-blockers may make little or no difference to the number of heart attacks among people with high blood pressure;
- People given beta-blockers are more likely to have side effects and stop treatment than people taking renin-angiotensin system inhibitors, but there may be little or no difference in side effects between beta-blockers and diuretics or calcium-channel blockers.

### Background

Beta-blockers refer to a mixed group of drugs with diverse pharmacodynamic and pharmacokinetic properties. They have shown long term beneficial effects on mortality and cardiovascular disease (CVD) when used in people with heart failure or acute myocardial infarction. Beta-blockers were thought to have similar beneficial effects when used as first-line therapy for hypertension. However, the benefit of beta-blockers as first-line therapy for hypertension without compelling indications is controversial.

### Questions

What are the effects of beta-blockers on morbidity and mortality endpoints in adults with hypertension?

#### The use of Beta-blockers for hypertension Cameroon

The national prevalence of hypertension is 29.7% in 16 to 94 years (Kingue et al., 2015). In a population based survey in Cameroon, only 24.6% of patients with hypertension on treatment had their blood pressure controlled (Dzudie et al., 2012). Improvement in the management and control of hypertension will require an understanding of the factors that affect blood pressure control. Beta-blockers are already used for hypertension in Cameroon. This intervention may help reduce the burden of disease due to hypertension.

**Table 1: Summary of the systematic review**

	<b>What the review authors searched for</b>	<b>What the review authors found</b>
<b>Studies</b>	Randomized controlled trials (RCTs)	Thirteen randomized controlled trials met the inclusion criteria.
<b>Participants</b>	Men and non-pregnant women, aged 18 years and over, with hypertension as defined by cut-off points operating at the time of the study under consideration.	Men and non-pregnant women, aged 18 years and over, with hypertension.
<b>Interventions</b>	The treatment group must have received a beta-blocker drug either as monotherapy or as a first-line drug in a stepped-care approach.	Three studies compared the effects of an ACE inhibitor (ramipril), a CCB (amlodipine), and a beta-blocker (metoprolol) on hypertensive renal disease progression in African American people. Four studies evaluated the long-term effects of a thiazide diuretic (bendroflumethiazide) compared to a betablocker (propranolol) in men with hypertension. Three trials were designed to determine whether the treatment of hypertension using beta-blocker therapy (atenolol) in a stepped-care approach compared to no treatment reduced the incidence of stroke, CHD, cardiovascular death, or all-cause mortality. Step one was monotherapy with atenolol, step two added a thiazide diuretic (bendrofluazide), and steps three and four added other antihypertensive agents. Three studies were designed to establish whether treatment of hypertension in older adults reduced the risk of stroke, CHD, and death from all causes. Participants were randomised to a beta-blocker (atenolol), a diuretic (amiloride and hydrochlorothiazide), or placebo.
<b>Controls</b>	Placebo, no treatment, or another antihypertensive drug	Placebo
<b>Outcomes</b>	<p><b>Primary outcomes</b></p> <ul style="list-style-type: none"> <li>• Mortality</li> </ul> <p><b>Secondary outcomes</b></p> <ul style="list-style-type: none"> <li>• Total (i.e. fatal and non-fatal) stroke.</li> <li>• Total coronary heart disease (myocardial infarction, sudden death).</li> <li>• Total cardiovascular disease (CVD: i.e. fatal and non-fatal CHD, stroke, congestive heart failure, and transient ischaemic attacks).</li> <li>• Adverse events leading to discontinuation of allocated treatment.</li> <li>• Degree of reduction in systolic and diastolic blood pressure achieved by beta-blocker therapy in relation to each comparator treatment.</li> </ul>	<p><b>Primary outcomes</b></p> <ul style="list-style-type: none"> <li>• Mortality;</li> <li>• Total stroke;</li> <li>• Total coronary heart disease;</li> <li>• Total cardiovascular disease;</li> <li>• Adverse events leading to discontinuation of allocated treatment;</li> <li>• Degree of reduction in systolic and diastolic blood pressure achieved by beta-blocker therapy in relation to each comparator treatment.</li> </ul>
<b>Date of the most recent search:</b> June 2016		
<b>Limitations:</b> This is a good quality systematic review, <b>AMSTAR =11/11</b>		
<b>Citation:</b> WiysongeCS, BradleyHA, Volmink J, Mayosi BM, Opie LH. <b>Beta-blockers for hypertension.</b> Cochrane Database of Systematic Reviews 2017, Issue 1. Art. No.: CD002003. DOI: 10.1002/14651858.CD002003.pub5.		

## Table 2: Summary of findings

Beta-blockers versus placebo as first-line therapy for hypertension			
<b>Participants:</b> people with hypertension <b>Settings:</b> high-income countries, mainly Western Europe and North America <b>Intervention:</b> beta-blockers <b>Comparison:</b> placebo			
Outcomes	Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)
Total mortality	0.99 [0.88-1.11]	23613 (4)	Moderate
Total cardiovascular disease	0.88 [0.79-0.97]	23613 (4)	Low
Total stroke	0.80 [0.66-0.96]	23613 (4)	Low
Total coronary heart disease	0.93 [0.81-1.07]	23613 (4)	Moderate
Withdrawal due to adverse effect	3.38 [0.82-13.95]	22729 (3)	Low

### Applicability

The trials were conducted in high-income countries, mainly Europe (three in Sweden, four in UK, three in Spain) and North America (three in USA).

These interventions require financial resources but may be applied in other low resources settings such as Cameroon, with some effort.

### Conclusions

People given beta-blockers are more likely to have side effects and stop treatment than people taking renin-angiotensin system inhibitors, but there may be little or no difference in side effects between beta-blockers and diuretics or calcium-channel blockers

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