Racial differences in blood pressure response to calcium channel blocker monotherapy: a meta-analysis

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CRD summary
The review concluded that blood pressure response to calcium channel blocker monotherapy was qualitatively similar in blacks and whites in USA. The authors' conclusions appeared to broadly reflect the evidence presented, but the restriction of using only trial data and limitations in the review processes made their reliability uncertain.

Authors' objectives
To determine whether United States blacks and whites have differential blood pressure response to calcium channel blocker monotherapy.

Searching
PubMed, EMBASE and Cochrane Central Register of Clinical Trials (CENTRAL) were searched for published studies between 1990 and October 2008; search terms were reported.

Study selection
Trials that presented race-specific changes in blood pressure from baseline for adult blacks and whites in USA treated with calcium channel blocker monotherapy were eligible for inclusion. Studies had to provide precision estimates: standard errors, standard deviations or confidence intervals (CI).

Participant groups in the included studies had mean ages that ranged from 54 to 66 years. The proportion of females ranged from zero to 54%. Mean baseline systolic blood pressures ranged from 146 to 157mmHg and mean diastolic blood pressures ranged from 84 to 102mmHg. Some studies used non-blacks as a classification and some used whites. Drugs used included nifedipine, diltiazem, isradipine and amlodipine (in various doses) for periods that ranged from four weeks to one year. All studies were of monotherapy, except one that assessed treatment as an add-on therapy.

The authors did not state how many reviewers selected studies for inclusion.

Assessment of study quality
The authors did not state that they formally assessed study quality, although use of randomisation and blinding was presented in a data table.

Data extraction
One reviewer extracted reduction in blood pressure data, with precision estimates, in order to calculate mean differences and relative risks (RR).

Methods of synthesis
Studies were pooled using a random-effects model. Sensitivity analyses examined drug type, age, percentage of females, percentage who received antihypertensive medications and treatment duration. Heterogeneity was assessed using the Q statistic and $I^2$. Publication bias was assessed using Begg's and Egger's tests and trim and fill was used to account for any bias.

Results of the review
Six clinical trials (eight data sets) were included in the review. Trails were of a total of 6,851 white or non-black participants and 3,371 black participants. Four studies used randomisation and three used blinding. Sample sizes ranged from 68 to 7,609 participants.

An initial meta-analysis of all six cohorts found no statistically significant difference between groups. After removal of two studies to reduce significant heterogeneity, the pooled difference in systolic blood pressure change between blacks...
and whites was -2.7mmHg (95% CI -4.0 to -1.3; four cohorts) and for diastolic blood pressure was -0.4mmHg (95% CI -1.0 to 0.3; six cohorts) with blacks having greater response. There was no indication of publication bias for the diastolic analysis, but there was for the systolic analysis.

However, whites were just as likely as blacks to attain a diastolic blood pressure goal of less than 90mmHg or a 10mmHg or greater change (RR 1.00, 95% CI 0.91 to 1.11), with little evidence of publication bias.

**Authors' conclusions**

Blood pressure response was qualitatively similar in blacks and whites in USA, which suggested that patient race was unlikely to offer any clinical utility for decisions about the likely effect of calcium channel blocker monotherapy.

**CRD commentary**

The review addressed a clear question and was supported by appropriate inclusion criteria (although exact details of eligible study designs were not specified). Attempts to identify relevant studies were undertaken by searching electronic databases and the restriction to including studies in USA meant that language bias would be unlikely to be an issue. The authors did not search for unpublished studies, so some relevant data may have been missed. Suitable methods were not employed to reduce risks of reviewer error and bias during data extraction. The authors did not report on whether methods such as independent duplicate assessment were used to select studies for inclusion.

Very little detail was presented about study design and no formal study quality assessment was made. The analyses were of active treatment-arm trial data, so it was unclear (considering the authors’ objective) why studies without control arms were not included to maximise the evidence available. Appropriate methods were used to pool data and heterogeneity was assessed, with possible causes investigated and discussed. The authors noted that none of the trials reported socioeconomic, psychological or behavioural data, so investigation of these covariates was not possible.

The authors’ conclusions appeared to broadly reflect the evidence presented, but the restriction of using only trial data and limitations in the review processes made their reliability uncertain.

**Implications of the review for practice and research**

**Practice:** The authors stated that the absence of quantitative evidence for substantial differences in blood pressure response ruled out a rational role for patients’ race in clinical decisions about the use of calcium channel blocker monotherapy.

**Research:** The authors did not state any implications for research.

**Funding**

Robert Wood Johnson Foundation (Investigator Award in Health Policy Research)

**Bibliographic details**


**PubMedID**

19498341

**DOI**

10.1038/ajh.2009.100

**Original Paper URL**

http://www.nature.com/ajh/journal/v22/n8/abs/ajh2009100a.html

**Indexing Status**

Database of Abstracts of Reviews of Effects (DARE)

Produced by the Centre for Reviews and Dissemination

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Subject indexing assigned by NLM

**MeSH**
African Continental Ancestry Group; Algorithms; Antihypertensive Agents /therapeutic use; Blood Pressure /drug effects; Calcium Channel Blockers /therapeutic use; Data Interpretation, Statistical; Ethnic Groups; European Continental Ancestry Group; Humans; Hypertension /drug therapy /epidemiology; United States

**AccessionNumber**
12009109004

**Date bibliographic record published**
03/02/2010

**Date abstract record published**
20/10/2010

**Record Status**
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.