Usefulness of statins pretreatment for the prevention of postoperative atrial fibrillation in patients undergoing cardiac surgery

Dong L, Zhang F, Shu X

CRD summary
The authors concluded that their meta-analysis supported the effectiveness of statin pre-treatment for reducing the incidence of postoperative atrial fibrillation in patients who underwent cardiac surgery. The absence of a full study quality assessment coupled with poor reporting of comparator treatments indicate that the authors’ conclusions should be interpreted with caution.

Authors’ objectives
To investigate whether pre-treatment with statins lowers the risk of post-operative atrial fibrillation.

Searching
PubMed, Cochrane Central Register of Controlled Trials (CENTRAL) and ClinicalTrials.gov were searched to August 2010 without language restrictions; search terms were reported.

Study selection
Randomised controlled trials (RCTs) that compared pre-operative statins with a control treatment for preventing post-operative atrial fibrillation (primary outcome) following cardiac surgery were eligible.

The studied drugs were simvastatin, pravastatin and atorvastatin (various regimens). Most patients underwent coronary bypass surgery with or without cardiopulmonary bypass. Mean ages ranged from 59 to 68 years. Most participants in all studies were male. Where reported, the proportion of patients with diabetes mellitus ranged from 27% to 52% and with hypertension from 23% to 90%. Concomitant drug regimens varied.

Two reviewers independently selected studies for inclusion. Disagreements were resolved by consensus.

Assessment of study quality
The authors did not report that they performed an assessment of study quality. Use of blinding was reported.

Data extraction
Intention-to-treat data were extracted in order to calculate odds ratios (OR) and mean differences with 95% confidence intervals (CI).

The authors did not state how many reviewers extracted data.

Methods of synthesis
Meta-analyses were performed to calculate pooled odds ratios and standardised mean differences (SMD) using a random-effects model and a fixed-effect model. Heterogeneity was assessed using Cochran’s test and $I^2$. Sensitivity analyses explored the effect of removing each trial individually. A funnel plot and Begg’s test were used to assess for publication bias.

Results of the review
Eight RCTs (n=841 participants, range 40 to 200) were included. Five trials were described as being double-blind.

Patients pre-treated with statins were significantly less likely to develop post-operative atrial fibrillation than control patients (OR 0.40, 95% CI 0.29 to 0.55, p=1.0 for heterogeneity; eight trials). There was no evidence of publication bias and sensitivity analyses yielded similar results.

Statin pre-treatment significantly shortened post-operative hospital stay compared to control treatment (SMD -0.39,
95% CI -0.53 to -0.24, p=0.11 for heterogeneity). There were no statistically significant differences between groups for death, myocardial infarction, stroke or for the composite of all three of these outcomes.

Authors’ conclusions
This meta-analysis supported the effectiveness of statin pre-treatment for reducing the incidence of postoperative atrial fibrillation in patients who underwent cardiac surgery.

CRD commentary
The review addressed a clear question and was supported by appropriate inclusion criteria. Attempts to identify relevant studies in any language were undertaken by searching two electronic databases and a clinical trials website; the authors reported no indication of publication bias. Suitable methods were employed to reduce the risk of reviewer error and bias during the study selection process; the authors did not report on whether such methods were used to extract data. Study quality was not fully appraised, so it was not possible to assess the reliability of the evidence. Study details were provided, although no details of the types of control treatments used were reported and this made interpretation of the results difficult. Appropriate methods were used to pool data and assess heterogeneity.

The authors highlighted the small study sample sizes as a reason for interpreting their findings with caution. The absence of a full study quality assessment coupled with poor reporting of comparator treatments provide further reasons for caution.

Implications of the review for practice and research
Practice: The authors stated no implications for practice.

Research: The authors stated a need for studies to identify the optimum statin type, dose and timing of administration and a need for studies on patients undergoing non-coronary cardiac surgery.

Funding
National Natural Science Foundation of China (No. 81000614); Young Scientific Phosphor Foundation (No. 08QA14019, Shanghai Science and Technology Development).

Bibliographic details

PubMedID
21108566

DOI
10.3109/07853890.2010.541491

Original Paper URL

Indexing Status
Subject indexing assigned by NLM

MeSH
Aged; Atrial Fibrillation /epidemiology /prevention & control; Cardiac Surgical Procedures; Female; Humans; Hydroxymethylglutaryl-CoA Reductase Inhibitors /therapeutic use; Incidence; Length of Stay; Male; Middle Aged; Postoperative Complications /epidemiology /prevention & control; Randomized Controlled Trials as Topic

AccessionNumber
12011000941

Date bibliographic record published
20/04/2011

Date abstract record published
14/09/2011

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.