Improved clinical outcomes with abciximab therapy in acute myocardial infarction: a systematic overview of randomized clinical trials


CRD summary
This review combined the results of four randomised controlled trials involving 3,266 patients undergoing percutaneous coronary intervention (PCI) for acute myocardial infarction. The authors concluded that their results strongly support the use of abciximab in primary PCI. This conclusion overlooked the possible biases in the review and the higher risk of major bleeding in the patients treated with abciximab.

Authors’ objectives
To assess the efficacy and safety of abciximab as adjunctive therapy during percutaneous coronary intervention (PCI) for acute myocardial infarction (MI).

Searching
MEDLINE was searched (no dates were given). The keywords were listed in the paper, but there was no mention of whether non-English language papers were included in the search. The bibliographies of identified articles were reviewed, as were scientific sessions abstracts from the following journals: Circulation, Journal of the American College of Cardiology and European Heart Journal. Only published results were included.

Study selection
Study designs of evaluations included in the review
The inclusion criteria for study design specified randomised controlled trials (RCTs) with a minimum of 200 patients.

Specific interventions included in the review
Selection criteria defined the intervention treatment as intravenous glycoprotein IIb/IIIa antagonists and the comparator treatment as placebo or control therapy, excluding fibrinolytic therapy. The intervention in the included studies was abciximab, given as a 250 microg/kg bolus followed by a 12-hour infusion of 125 microg/kg per minute. All patients received initial aspirin (intravenous or oral) therapy, while some received a thienopyridine and some also received heparin. Stent implantation was performed in 59% of the patients in the included studies.

Participants included in the review
The inclusion criteria for the participants specified those who had acute coronary syndromes with persistent ST-segment elevation, or acute MI diagnosed from angiography. The participants in the included studies were mostly male (73.9%), had a mean age of 60 years, and 14% had had a previous PCI or bypass surgery.

Outcomes assessed in the review
The inclusion criteria for the outcomes specified the description of a 30-day end point for death, reinfarction, urgent or ischaemic target vessel revascularisation (TVR) and major bleeding, and also a 6-month end point for death, reinfarction and repeat TVR. The primary end point for efficacy was defined as the composite of death, reinfarction or TVR at 30 days. Trial-specific definitions of reinfarction, which differed between trials, were maintained in the analysis.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity.
Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction. Odds ratios (ORs) for the effectiveness of abciximab were calculated for each study, using intention-to-treat methods.

Methods of synthesis
How were the studies combined?
Empirical Bayesian random-effects models were used to calculate summary ORs. Absolute treatment differences were converted from ORs, assuming the pooled control rate applied to the total study population.

How were differences between studies investigated?
The authors did not report a formal test of heterogeneity. Subgroup analyses were performed to investigate differences in the effectiveness of abciximab in patients undergoing stenting compared with those undergoing angioplasty.

Results of the review
Four RCTs involving 3,266 patients were included in the review.

Abciximab was associated with a statistically significant decrease in the occurrence of the combined end point of death, reinfarction or TVR at 30 days compared with control (OR 0.54, 95% confidence interval, CI: 0.40, 0.72). Each of these individual outcomes was also lower in patients receiving abciximab, although this was only statistically significant for TVR.

Abciximab therapy was associated with a statistically significant increase in the risk of a major bleeding event by 30 days (OR 1.74, 95% CI: 1.11, 2.72) and the need for a blood transfusion (OR 1.45, 95% CI: 1.04, 2.02).

The beneficial effects of abciximab therapy on the occurrence of death, reinfarction or TVR persisted at 6 months (OR 0.80, 95% CI: 0.67, 0.97).

The authors stated that the subgroup analyses suggested no difference in the effectiveness of abciximab in patients undergoing stenting compared with those undergoing angioplasty. These results were not presented.

Authors’ conclusions
Treatment with abciximab reduces adverse ischaemic events in primary PCI for acute MI, and the benefit is maintained at the 6-month follow-up.

CRD commentary
The review addressed a clearly defined research question. The search strategy used was limited to published studies and appears to have been restricted to English language reports. This could have introduced bias into the review if trials with less positive results were not published, or were published in the non-English language literature. There was no information on the methods of the review (e.g. study selection, data extraction). The lack of any validity assessment, or inadequate methods, may mean that the presented results are unreliable or biased.

It is unclear whether it was appropriate to statistically pool the studies. Statistical heterogeneity was not assessed and the extent of clinical heterogeneity could not be assessed from the information presented. The authors’ conclusions follow from their results, but are not sufficiently conservative given both the possible limitations of the review itself, and the increased risk of major bleeding associated with abciximab, which was found in the review.

Implications of the review for practice and research
Practice: The authors stated that their results strongly support the use of adjunctive glycoprotein IIb/IIIa inhibition in
primary PCI.

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

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