Improved clinical outcomes with intracoronary compared to intravenous abciximab in patients with acute coronary syndromes undergoing percutaneous coronary intervention: a systematic review and meta-analysis

Riis Hansen P, Iversen A, Abdulla J

CRD summary
This review concluded that in comparison with standard intravenous administration, intracoronary abciximab improved clinical outcomes for patients with acute coronary syndromes who underwent percutaneous coronary intervention; especially patients with ST segment elevation myocardial infarction. The findings of the review may not be reliable given the risk of missing data and limitations of the included studies.

Authors' objectives
To compare clinical outcomes for intracoronary and intravenous abciximab in patients with acute coronary syndromes undergoing percutaneous coronary intervention (PCI).

Searching
PubMed, EMBASE and The Cochrane Library were searched for studies published up to November 2009. No language restrictions were applied. Keywords were reported. Reference lists of retrieved studies were screened for further studies.

Study selection
Studies that compared the effects of intracoronary or intravenous abciximab on mortality rates and major adverse coronary events (MACE) in patients with acute coronary syndromes (ST segment elevation myocardial infarction (STEMI), non-STEMI and angina) who underwent PCI were eligible for inclusion in the review. Eligible studies had to have a follow-up period of at least four weeks.

Included studies assessed patients with STEMI, N-STEMI or unstable angina; half of the studies assessed only STEMI patients. Mean patient age was 62 years. The proportion of male patients was 78%. Twenty-four per cent of patients were diabetic. All patients were pre-treated with aspirin and unfractionated heparin. Catheterisation was performed using the femoral or radial approach. Nearly all patients received intracoronary stents and thienopyridine (250mg twice daily) or clopidogrel (300mg to 600mg loading dose and 75mg daily) before, during or immediately after the procedure. Intracoronary abciximab was injected directly though a dual lumen catheter. Most studies used abciximab bolus followed by a 12-hour intravenous infusion. Nearly all of the included studies reported MACE and mortality rates. Studies were carried out between 1996 and 2008.

The authors independently selected the studies for inclusion in the review.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated for mortality and MACE. All of the authors extracted the study data independently. Additional data was also extracted from a recently completed study at their institution.

Methods of synthesis
Studies were grouped according to outcome. Pooled odds ratios with 95% CIs were calculated using a random-effects model. Heterogeneity was assessed using the I² statistic; values above 20% were considered to show evidence of significant heterogeneity. Meta-regression was performed to investigate potential sources of heterogeneity.

Results of the review
Eight studies (n=2,322 patients) were reported in the review: five randomised controlled trials (RCTs) (n=577) and three retrospective studies (n=1,545). Sample sizes ranged from 45 to 1,005. Follow-up ranged from one to 12 months.

In comparison with intravenous abciximab, intracoronary abciximab significantly reduced mortality (OR 0.57, 95% CI 0.35 to 0.94, I²=0%; three retrospective studies and four RCTs). There was no significant difference between intravenous and intracoronary abciximab with respect to the rate of MACE; this analysis was associated with a significant level of heterogeneity (I²=66.5%; three retrospective studies and four RCTs).

Further analyses that removed each study in turn failed to remove the heterogeneity. Meta-regression with seven baseline variables (age, gender, diabetes mellitus, hypertension, hyperlipidaemia, follow-up duration and ratio of STEMI patients) failed to identify any significant confounding variable. Significant differences in mortality in favour of intracoronary were most apparent in studies of patients with STEMI and in short-term (one month) studies.

Authors' conclusions
In comparison with standard intravenous administration, intracoronary abciximab improved clinical outcomes for patients with acute coronary syndromes who underwent percutaneous coronary intervention; this was especially so for patients with STEMI.

CRD commentary
This review assessed a clearly defined research question and included a broad range of study designs. Relevant electronic databases were searched for eligible studies without any language restrictions. Only published studies were eligible for inclusion, so there was a risk of missing data and publication bias. The risk of reviewer error and bias was reduced by involvement of multiple reviewers in study selection and data extraction. The risk of bias within the studies was unclear as the reviewers did not assess the methodological quality of studies.

Given the greater risk of bias associated with retrospective studies, the findings should be interpreted with caution. The authors noted the small size of many of the studies, which may have limited their potential to detect a statistically significant effect. Other data limitations were discussed and may have influenced the reliability of the review findings. There was evidence of both clinical and statistical heterogeneity between the studies. Further analyses were conducted to investigate the potential source of this heterogeneity.

Overall, the findings of the review may not be reliable given the risk of missing data and the limitations of the included studies.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that large multicentre randomised controlled trials in contemporary clinical settings were awaited.

Funding
None stated.

Bibliographic details

PubMedID
20516508

Original Paper URL
http://www.invasivecardiology.com/articles/Improved-Clinical-Outcomes-with-Intracoronary-Compared-Intravenous-Abciximab-Patients-with-

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Acute Coronary Syndrome /drug therapy; Angioplasty, Balloon, Coronary; Antibodies, Monoclonal /administration & dosage; Combined Modality Therapy; Coronary Vessels; Drug Administration Routes; Humans; Immunoglobulin Fab Fragments /administration & dosage; Injections, Intra-Arterial; Injections, Intravenous; Platelet Aggregation Inhibitors /administration & dosage

**AccessionNumber**
12010004505

**Date bibliographic record published**
01/12/2010

**Date abstract record published**
18/05/2011

**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.