The safety of early versus late ambulation in the management of patients after percutaneous coronary interventions: a meta-analysis

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CRD summary
The authors stated that early ambulation after percutaneous coronary intervention was not associated with an increased risk of haematoma or bleeding, and that there was sufficient evidence to implement early ambulation after surgery. Limitations in the conduct of the review and in the evidence mean that these conclusions are not sufficiently cautious and may not be reliable.

Authors' objectives
To evaluate the safety of early ambulation versus late ambulation after percutaneous coronary interventions.

Searching
MEDLINE, Web of Science, The Cochrane Library and EMBASE were searched up to December 2011. Search terms were reported. Relevant studies and research reports were handsearched, and grey literature databases were searched for further studies. Studies had to report outcomes in English.

Study selection
Randomised controlled trials (RCTs) and quasi-RCTs that compared the effect of early versus late ambulation (two to four hours versus six to 10 hours of bedrest) in patients following percutaneous coronary interventions were eligible. Major vascular complications (haematoma and bleeding) had to be reported.

Studies were published between 2001 and 2010. Outcomes measures varied across the studies. Patient characteristics and percutaneous coronary interventions methods were not reported. The authors did not state whether study selection was performed in duplicate.

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

Data extraction
Outcomes data were extracted to calculate risk ratios. The authors did not state how many reviewers extracted data.

Methods of synthesis
Pooled risk ratios were calculated using meta-analysis (fixed-effect and random-effects models). Heterogeneity was assessed using $X^2$, $I^2$ and $T^2$. Sensitivity analysis was performed by omitting one study at a time to assess the effect of individual studies on the pooled relative risk. Publication bias was assessed with Egger's and Begg's tests.

Results of the review
Five studies (1,854 patients) were included in the review and meta-analyses; three RCTs and two non-randomised comparative studies. Duration of follow-up was generally unclear.

There was no significant difference in risk of haematoma between short bedrest long bedrest. There was a difference in bleeding risk favouring late ambulation which was not statistically significant (RR 1.77; 95% CI 0.87 to 3.59). There was no evidence of heterogeneity ($I^2=0\%$). Sensitivity analyses were reported and showed no significant difference in the pooled estimates.

Authors' conclusions
Early ambulation after percutaneous coronary interventions was not associated with an increased risk of haematoma or bleeding. This study confirmed the findings of the included studies recommending reducing the bedrest time after removal of the arterial sheath.
The review question was clear and the review used reproducible selection criteria. Several bibliographic sources were consulted, but studies that reported outcomes in a language other than English were excluded. The authors did not report whether steps were taken to minimise reviewer error and bias during the study selection and data extraction stages of the review. They did not report that they assessed study quality.

Few studies were included. Of those, two were not randomised, which suggested high risk of selection bias. Patient characteristics and surgical methods prior to ambulation were not reported, and outcome measurements varied across the studies. Therefore, it was unclear whether pooling was appropriate. No evidence of statistical heterogeneity was found and sensitivity analyses did not change the direction and significance of the pooled estimates.

Due to multiple limitations in the conduct of the review, the limited number of randomised studies found and limited number of events, it could more appropriate to state that there was insufficient evidence rather than evidence of no difference in effectiveness. Therefore, the recommendations for practice may not be sufficiently cautious and the conclusions may not be reliable.

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

**Practice:** The authors stated that practice of early ambulation after percutaneous coronary interventions should be implemented without conducting more primary study on this issue.

**Research:** The authors stated that a study on safety of early ambulation after percutaneous coronary interventions via radial approach should be conducted.

**Funding**

No funding.

**Bibliographic details**


**PubMedID**

22521852

**DOI**

10.1016/j.ijnurstu.2012.03.012

**Original Paper URL**

http://www.journalofnursingstudies.com/article/S0020-7489(12)00120-4/abstract

**Indexing Status**

Subject indexing assigned by NLM

**MeSH**

Humans; Percutaneous Coronary Intervention; Randomized Controlled Trials as Topic; Walking

**AccessionNumber**

12012058111

**Date bibliographic record published**

18/02/2013

**Date abstract record published**

11/04/2013

**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.