The clinical effectiveness of length of bed rest for patients recovering from trans-femoral diagnostic cardiac catheterisation

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CRD summary
This review assessed the optimal length of bed rest for patients following transfemoral diagnostic cardiac catheterisation and concluded that there was no evidence of benefit for more than three hours of bed rest. The poor quality of the included studies, paucity of outcomes data and uncertainty over generalisability suggest that this conclusion should be interpreted with caution.

Authors' objectives
To assess the optimal length of bed rest for patients following trans-femoral diagnostic cardiac catheterisation.

Searching
CINAHL, MEDLINE, EMBASE, The Cochrane Library, Current Contents, EBSCO, Web of Science, British Nursing Index and Controlled Clinical Trials databases and Google Scholar, Dissertation Abstracts International and Proceedings First were searched for English-language studies without publication restrictions to July 2007; search terms were reported. Reference lists and bibliographies of included articles were searched to identify additional articles and handsearches of relevant journals were undertaken. Investigators working in the area were contacted to provide details of further trials.

Study selection
Randomised and quasi-randomised controlled trials (RCTs) in adult patients aged at least 18 years who underwent transfemoral diagnostic cardiac catheterisation in day surgery units or in-hospital settings that assessed the effect of bed rest on the incidence of vascular complications or patient comfort were eligible for inclusion. Trials that assessed gradual mobilisation were eligible. Eligible interventions compared bed rest of varying duration. Excluded trials assessed: bed rest following diagnostic cardiac catheterisation through radial or brachial surgery; various sizes of cardiac catheters; and bed rest protocols with other interventions.

Bed rest duration in the included studies ranged from two hours to 24 hours. Catheter size ranged from 4F to 9F. The primary outcomes were bleeding (blood loss >100mL or bleeding leading to attempts to re-establish homeostasis by manual pressure, sandbag or reinforcement of pressure dressing) and haematoma (width >1cm). A number of secondary outcomes included various measures assessed through incidence (back pain, pseudo aneurysm, bruising, local thrombus formation, groin pain), revisits to hospital, complications of the extremity, urinary discomfort, patient satisfaction and costs. Where stated, the age of included participants ranged from 29 to 85 years and the proportion of males ranged from 44% to 100%; over half of the included studies were undertaken in a hospital setting and half were undertaken in the USA.

Two reviewers independently selected studies for the review. The authors did not state how disagreements were resolved.

Assessment of study quality
Two reviewers independently assessed validity using the Joanna Briggs Institute quality checklist for experimental studies covering a wide range of validity issues. Disagreements were resolved through consultation with a third reviewer.

Data extraction
Two reviewers independently extracted the data to calculate odds ratios (OR) with 95% confidence intervals (CI) for dichotomous outcomes and means and standard deviations for continuous outcomes. Any disagreements were resolved through consensus.
Methods of synthesis
Pooled odds ratios and weighted mean differences (WMD) and their 95% CI were calculated using a random-effects models. A fixed-effects model was used if statistical heterogeneity was absent. Heterogeneity was assessed using the $I^2$ test.

Results of the review
Eighteen RCTs were included (n=4,294, range 29 to 874). Studies were generally of poor quality: randomisation method was reported in seven studies; one trial undertook analysis on an intention-to-treat analysis; and 11 studies followed-up 80% of the participants.

There was no significant difference in the incidence of bleeding across various the bed rest time periods: six hours versus less than six hours (seven studies); six hours versus more than six hours (one study); four to 4.5 hours versus less than four hours (three studies); and four hours versus 12 to 24 hours (one study). There was no significant difference in the incidence of haematoma formation across various of the bed rest time periods: six hours versus less than six hours (eight studies); six hours versus more than six hours (one study); four to 4.5 hours versus less than four hours (five studies); and four hours versus 12 to 24 hours (one study).

Following coronary catheterisation the odds of developing back pain at four hours (OR 24.60, 95% CI 1.29 to 469; one study) and 24 hours (OR 2.47, 95% CI 1.16 to 5.23; two studies) was significantly greater among patients randomised to six hours compared with three hours of bed rest. There was a significant reduction in the incidence of back pain for patients who received 2.5 hours of bed rest compared to those with four hours (OR 4.54, 95% CI 2.50 to 8.25; one study).

Non-significant findings for further secondary outcomes were reported in the paper.

Cost information
A significant reduction in total catheterisation charges was observed between three hours and six hours of bed rest (US dollars $2,429 ±$850 versus $3,108 ±$1,451; one study) and savings of $105 per patient who received three hours as opposed to six hours bed rest (one study).

Authors’ conclusions
There was no evidence of benefit relating to bleeding and haematoma formation for patients who had more than three hours of bed rest following transfemoral diagnostic cardiac catheterisation.

CRD commentary
The review addressed a clear question and undertook a thorough search for studies; both published and unpublished studies were sought. The language restriction meant that the review may have been prone to language bias. It appeared that all parts of the review process were conducted with appropriate attempts to minimise errors and biases. Appropriate criteria were used to assess the quality of included studies, but most were of poor quality. Appropriate methods were employed for the meta-analysis and suitable methods were used to assess statistical heterogeneity. Generalisability may have been compromised as none of the included trials reported using vascular closure devices to obtain haemostasis; therefore, the review findings could not be extended to patient groups that use these devices. Generally this was a well-conducted review, but the findings appeared to be limited by the poor quality of the included studies, a paucity of outcomes data and uncertainty over generalisability. In light of these shortcomings the authors conclusions should be interpreted with caution.

Implications of the review for practice and research
Practice: Clinicians should consider a balance between avoiding increased risk of haematoma formation (through two to 2.5 hours of bed rest) and circumventing back pain (through more than four hours of bed rest).

Research: Properly designed and powered multicenter trials were required that compared the clinical benefits and cost-effectiveness of different lengths of bed rest following transfemoral diagnostic cardiac catheterisation. A standardised and validated tool should be used for the measurement of haematoma and trials should be reported according to CONSORT guidelines. Larger sized trials were required to assess the effectiveness of bed rest for two hours and further
trials were required that assessed closure with vascular devices.

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