



Review

Early ambulation after diagnostic transfemoral catheterisation: A systematic review and meta-analysis

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ABSTRACT

Background: Femoral arterial puncture is the most common method of vascular access for angiography. Because of possible vascular events, all patients are restricted to strict immobilisation and bed rest for 2–24 h, which is accompanied by back pain and discomfort.

Objective: To assess the effects of the duration of bed rest after transfemoral catheterisation on the prevention of vascular complications and general discomfort, pain, urinary discomfort and patient satisfaction.

Data sources: We searched the Cochrane Library, MEDLINE, SCOPUS, CINAHL, Proquest Dissertations, Open SIGLE, Iranmedex and Irandoc.

Study selection: We included blinded or unblinded randomised controlled trials and quasi-randomised controlled trials that used two different durations of bed rest after angiography before the ambulation was permitted.

Data extraction and analysis: Two reviewers separately assessed the quality of each study and extracted the data. We present dichotomous outcomes as odds ratios with 95% confidence intervals (CI) and continuous outcomes as mean differences with 95% CI.

Data synthesis: Twenty studies involving a total of 4019 participants with a mean age of 59.5 years were included. The studies considered periods of bed rest ranging from 2 to 24 h, which we compared in three main categories. There were no statistically significant differences between categories in the incidence of bleeding, haematoma, bruising, pseudoaneurysm, thrombus or arteriovenous fistula. Back pain intensity was assessed in four studies. Patients had significantly less back pain after 2–4 h bed rest compared to 6 h bed rest at 2 h (mean difference: -0.70 , 95% CI: -1.07 , -0.32), 4 h (mean difference: -0.60 , 95% CI: -0.96 , -0.24) and 6 h of follow-up (mean difference: -3.77 , 95% CI: -4.48 , -2.92). One study that assessed urinary discomfort reported less urinary discomfort when bed rest lasted 4 h compared to 12–24 h (mean difference: -1.48 ; 95% CI: -2.37 , -0.59). In addition, reduced bed rest time may significantly decrease the costs of hospital care.

Conclusions: This systematic review suggests that patients can be ambulated after 2–3 h following transfemoral catheterisation, and that early ambulation had no significant effect on the incidence of vascular complications and may reduce back pain and urinary discomfort.

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What is already known about the topic?

- Because of possible vascular events at the groin site, patients are restricted to immobilisation in the supine position for 2–24 h.
- Different periods of bed rest are recommended after catheterisation.

What this paper adds

- This systematic review suggests that reducing the duration of bed rest to 2–3 h does not increase vascular complications after diagnostic transfemoral catheterisation, and may reduce back pain and urinary discomfort.

1. Introduction

Femoral arterial puncture is the standard technique used to access the coronary arteries during coronary angiography, electrophysiological studies and diagnostic catheterisation of the aorta, renal, mesenteric, carotid and upper extremity arteries (Berry et al., 2004; Kato et al., 2009). In 2006, more than 1,115,000 angiogrammes were performed in the USA to diagnose and treat patients with vascular diseases (Lloyd-Jones et al., 2008). Catheterisation is normally performed by skin puncture under local anaesthesia. This procedure can lead to a variety of complications ranging from mild to severe haematoma, haemorrhage, acute thrombosis, distal embolisation, pseudoaneurysm, arteriovenous fistula, bruising, abscess, mycotic aneurysms and femoral nerve palsy. The procedure also incurs significant financial costs (Carrozza, 2012; Castillo-Sang et al., 2009). The most common complications are bleeding and haematoma, which usually appear within 12 h after the intervention, and which may lead to localised pain, hypotension and reduced haematocrit. Other problems such as arteriovenous fistula and pseudoaneurysm may not become apparent until days or weeks after the procedure (Carrozza, 2012).

Because of possible vascular events at the groin site, all patients are prescribed strict immobilisation and bed rest in the supine position (Rezaei-Adaryani et al., 2009). The involved leg is immobilised for 2–24 h after the procedure to prevent vascular complications, which occur at a rate of 1.96% (0.86–2.5%) in patients who have undergone transfemoral catheterisation (Boztosun et al., 2008; Chair et al., 2007; Lloyd-Jones et al., 2008). Bleeding and haematoma are normally formed in the soft tissue of the upper thigh and disappear a few days after catheterisation. These symptoms sometimes result in femoral nerve compression which may persist for weeks to months (Carrozza, 2012). It is therefore important to identify safe and feasible approaches to promote patient comfort without increasing the risk of vascular complications including haematoma and bleeding (Chair et al., 2007).

Different periods of bed rest are recommended after catheterisation. Boztosun et al. (2008) suggested 2 h of bed rest after angiography through the femoral artery when a 6 French catheter is used, and Bogart et al. (1999)

recommended 4 h of bed rest after coronary angiography with an 8-French catheter.

It has been argued that prolonged bed rest may be associated with more discomfort, dissatisfaction, back pain, voiding problems and groin site pain (Dowling et al., 2002). Chair et al. (2007) found that earlier ambulation after angiography significantly reduced the risk of urinary discomfort. A large proportion of patients find it difficult to use the bedpan in the supine position during bed rest. Studies have also reported that back pain increases with longer duration of bed rest after catheterisation (Chair et al., 2007; Ashktorab et al., 2009). If the sandbag is removed from the insertion site and patients are given permission to change their position in bed, they experience significantly less fatigue and back pain, and their satisfaction and comfort increase (Rezaei-Adaryani et al., 2009; Wood et al., 1997). In addition, early ambulation may reduce length of the hospital stay and the cost of nursing care (Gianakos et al., 2004).

Regarding the duration of bed rest, studies have investigated a wide range of times to mobilisation after catheterisation. Some studies have considered 2 h of bed rest as early and 4 h as late ambulation. These studies have concluded that 2 h of bed rest after the procedure is safe (Baum and Gantt, 1996; Kato et al., 2009). Several studies have considered 2–4 h as early ambulation and 6 h as late ambulation (Ashktorab et al., 2009; Bogart et al., 1999). Other studies have considered 6 h as early and 12–24 h as late ambulation. Most of these studies have reported that early ambulation is safe and feasible (Keeling et al., 1994; Lau et al., 1993); however, their findings vary widely there appears to be no clear conclusion regarding the optimum duration of bed rest after transfemoral catheterisation (Bogart et al., 1999; Boztosun et al., 2008; Chair et al., 2007). This controversy among studies highlights the importance of conducting a systematic review designed to explore the effects of different durations of bed rest on the prevention of vascular complications after diagnostic transfemoral catheterisation.

2. Objective

To assess the effects of the duration of bed rest after transfemoral catheterisation on the occurrence of vascular complications and level of comfort, pain, urinary discomfort and patient satisfaction.

3. Methods

3.1. Search strategy

We identified relevant studies meeting the inclusion criteria by a computer-aided search of CENTRAL in the Cochrane Library (Issue 3, 2012), MEDLINE (from 1966 to February 2012), SCOPUS and CINAHL (from 1982) by using both free text and MeSH terms. We also searched Proquest Dissertations, Open SIGLE and Persian medical databases (Iranmedex, Irandoc). Studies were eligible regardless of time of publication, language of publication, or publication status. For MEDLINE search strategy see online Appendix 1.

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