Early Mobilization After Femoral Approach Diagnostic Coronary Angiography to Reduce Back Pain

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ABSTRACT: **This review aims to provide an evidence-based argument that time to mobilization can be decreased in patients after femoral approach diagnostic coronary angiogram in patients with a low risk of vascular complications, where a vascular closure device has not been used. Early mobilization will help to decrease or prevent the potential for back pain occurring. A total of 15 studies published from 1996 to 2011 that met the inclusion criteria were identified. Risk ratios and 95% confidence intervals of vascular complications were calculated for all studies, and a meta-analysis was completed.**

The results from this study showed no statistically significant difference in vascular complications between the control groups and the early mobilization (out of bed) groups at ≤2, 3, or 4 hr after femoral approach coronary angiogram. Therefore, mobilization after femoral approach coronary angiogram, without deployment of a vascular closure device, may be as safe at 1.5 to 4 hr mobilization as it is at 6 hr and is likely to have a positive benefit of reducing back pain related to lying in bed. (J Radiol Nurs 2015;34:162-169.)

KEYWORDS: **Early mobilization; Interventional cardiology; Early ambulation; Coronary; Angiography; Femoral; Back pain.**

BACKGROUND

Coronary angiography involves an injection of a radiopaque contrast media into the coronary arteries under fluoroscopy allowing visualization of the coronary anatomy and therefore pathologies, such as atherosclerosis, thrombosis, and patency of any coronary artery bypass grafts (Asinas, 2010). A transfemoral puncture via a 5F to 8F sheath is the most common approach, but the brachial and radial arteries can also be used (Chair, Thompson, & Li, 2007).

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There are many differences in practices for care after angiogram (Wang, Redeker, Moreyra, & Diamond, 2001). Arterial femoral sheaths after diagnostic angiograms are generally removed immediately after the procedure (Lauck, Johnson, & Ratner, 2005). After sheath removal, hemostasis is most often maintained with manual compression using digital pressure or an adjunctive mechanical compression device. The patient then remains on bed rest (mainly supine with the affected leg straight) for 4 to 6 hr more (Sabo, Chlan, & Savik, 2008); this is intended to reduce the chances of vascular complications at the groin site (Chair, Taylor-Piliae, Lam, & Chan, 2003).

Because of this enforced supine bed rest, immobilization, and restricted positioning, patients frequently experience back pain (Chair et al., 2003). Prolonged bed rest causes pressure to be exerted continuously onto the same back muscles, causing muscle fatigue and weakness. This fatigue causes back pain because of back spasms (Chair, Li, & Wong, 2004). It is evident that back pain is a significant issue faced by patients on bed rest after a coronary angiogram (Chair et al., 2007;

Hoglund, Stenestrand, Todt, & Johansson, 2011; Pollard et al., 2003; Wang et al., 2001; Wood et al., 1997). Rezaei-Adaryani, Ahmadi, and Asghari-Jafarabadi (2009) have suggested that bed rest and positioning regimes after coronary angiogram are based on tradition rather than research. This review aims to provide an evidence-based argument that time to mobilization can be decreased in patients after femoral approach diagnostic coronary angiogram with a low risk of vascular complications. This in turn will help to decrease or prevent the potential for back pain occurring.

METHODOLOGY

Objectives

The aim of this systematic review and meta-analysis was to ascertain whether it is safe for nurses to mobilize patients out of bed 4 hr or earlier after a femoral approach coronary angiogram without the use of a vascular closure device to reduce back pain while not increasing the risk of vascular complications at the puncture site.

Methods

Types of Studies. This review included randomized controlled trials (RCTs), non-RCTs (control group decided by a retrospective analysis of data, before a change in protocol), and quasi-RCTs (participants allocated week—about to the experimental or control group). There was no minimum number of trial participants set, and the study could come from any country as long as it was published in English. There was a 15 year limit applied to the studies, that is, they needed to have been published in 1996 or later to be included. Data collection using a quantitative tool was required.

Types of Participants. The review included studies with both male and female participants older than 18 years. Participants were of many different ethnicities and countries and included both outpatients and acute inpatients.

Types of Interventions. The participants in the studies had received a femoral approach diagnostic coronary angiogram with a sheath sized between 5F and 8F. The included studies needed to test the intervention of early mobilization after femoral approach diagnostic coronary angiogram while assessing levels of vascular complications. Secondary measurement of back pain in each group of a trial was an advantage.

A study was not included if the participants received a diagnostic coronary angiogram through an artery other than the femoral artery, that is, brachial or radial artery or a simultaneous percutaneous coronary intervention. Studies where participants received angiograms to other parts of the body not including the heart were also excluded. Studies where patients were treated with a vascular closure device were excluded.

Types of Outcome Measures. The primary outcome measures for this review were vascular complications, including bleeding, hematoma (including retroperitoneal hematoma), and pseudoaneurysm. For an intervention to have been successful, the rate of complications in both the control and intervention groups cannot be statistically significantly different or must favor the experimental group if there is a significant difference.

The secondary outcome measures for this study included levels of back pain, discomfort, and patient satisfaction. For an intervention to have been successful, there needed to be a statistically significant reduction in back pain/discomfort or a raised level of patient satisfaction in the experimental group.

Data Collection and Analysis

Selection of Studies. Through a thorough literature search, 709 studies were considered for use in this review. After reading the abstracts of these articles, 18 were considered to be potentially usable, and the full-text articles were obtained. They were then vetted against the inclusion and exclusion criteria for this review. From these articles, 15 were deemed suitable and had relevant data (Table 1).

Measurements of Intervention Effect. For dichotomous data, the results were presented as a risk ratio (RR) with 95% confidence intervals (CIs) (Table 2). For calculation of statistical significance, a two-tailed Fisher exact test was used. In the case of a sample size too large for the Fisher test, a Pearson Chi-squared test was used. Statistical significance was set at $p \leq .05$.

Sensitivity Analysis. After the initial analysis of all included studies, each time frame was reanalyzed using only RCTs, with a lower risk of bias, to find out if the risk of bias altered the initial results.

RESULTS

Description of Studies

A total of 15 studies were identified that met the inclusion criteria. The included studies contained a total of 4,581 participants, 2,237 in experimental groups and 2,344 in control groups. The studies were published from 1996 to 2011. Seven studies were undertaken in the United States, three in Canada, two in the United Kingdom, and one each in Hong Kong, Sweden, and Iran, all taking place in just one facility. Study length varied throughout the trials, from between 3 and 24 months. Wang et al. (2001) had the lowest number of total participants at 82 among the studies, with