



Evaluation of feasibility and safety of changing body position after transfemoral angiography: A randomized clinical trial

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Background: Considering the growing number of patients who suffer from cardiovascular and coronary artery disease and the significant importance of angiography in the diagnosis of coronary artery disease, this study investigated the effects of position change on the acute complications of coronary angiography.

Methods: This study was a randomized clinical trial. Sixty patients undergoing coronary angiography, which was performed by a single operator were selected by convenience sampling method and were assigned to intervention or control groups by randomized block design (30 cases in each group). Intervention group patients' position was changed according to schedule, whereas patients in the control group remained in the supine position in complete bed rest. At the entrance hours, 3, 6, 8, and 24 hours after the angiography, patients in both groups were evaluated in terms of vascular complications, urinary retention, low back pain, groin pain, and comfort. Data were analyzed by repeated measures, Friedman, Mann-Whitney, chi-square, independent t-test, and Kolmogorov-Smirnov tests with SPSS-22.

Results: The two groups did not show any significant difference in terms of demographic, clinical, and preinterventional catheterization characteristics ($P > 0.05$). There was no significant difference with regard to vascular complications including hematoma ($P = 0.149$), bleeding ($P > 0.01$), bruise ($P = 0.081$), and thrombosis in the two groups of patients during 5 consecutive reviews. However, there was a significant statistical difference regarding low back pain ($P < 0.001$), groin pain ($P < 0.001$), urinary retention ($P = 0.02$), and comfort ($P < 0.001$).

Conclusions: The results of this study showed that changing the positions of patients after angiography based on the provided program created no change in the incidence of vascular complications (hematoma, bleeding, thrombosis, and bruise) but resulted in reduced severity of back pain, groin pain, urinary retention, and increased patients' comfort. (*J Vasc Nurs* 2016;34:106-115)

Cardiovascular disease is one of the leading causes of death for women and men of all ethnicities and races,¹ and it is expected to remain the most common cause of death in the world until 2020.² Among heart disease, coronary artery diseases is the most common and life-threatening one.³

There are different diagnostic methods for assessing coronary artery disease.⁴ Coronary angiography is the golden standard test to identify the presence and extent of atherosclerotic disease of coronary artery.⁵ Annually, nearly three million cardiac catheterizations are done in the United States of America.⁶ Angiography involves injecting a radiopaque dye into the coronary arteries under fluoroscopy which determines the condition of the coronary arteries and the degree of atherosclerosis.⁷

Although the risks and complications associated with angiography depends on the patient's condition, operator's skill, and judgment, any invasive procedure has some complications associated with the procedure.⁵ Coronary angiography can be accessed via the potential arteries included brachial, radial and femoral arteries.⁷⁻¹¹ About 95% of angiography is performed via femoral artery.^{12,13}

Access to the heart via femoral artery can be accompanied with complications such as arrhythmia, vascular complications (bleeding, hematoma, and thrombosis), injury and myocardial ischemia, coronary artery perforation, hemodynamic collapse, cerebrovertebral accident including transient ischemic attack, allergy to contrast media and acute renal failure.¹⁴⁻¹⁸ Demonstration of these complications can be divided in two main form of acute and chronic. The former includes hematoma, bleeding, thrombosis, urinary retention, low back pain, and groin pain.⁵

Studies have shown that to avoid possible complications due to arterial injuries, the current method of treatment after

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angiography in many health care facilities in Iran is to have the patient rest in the supine position with the head angle of zero degrees for 8–24 hours and keeping 4 kg (8.82 lbs) sandbag on the catheter insertion site for 6 hours,^{19–21} which has often been conducted based on tradition and experience.¹⁹ This insistence on bed rest for patients after coronary catheterization can lead to restlessness, discomfort, and frequent complaint of back and groin pain.¹¹ About 42% of patients who get out of bed after 4 hours of rest experience back pain.²⁴ In addition, 11.4% of patients undergoing this procedure may develop urinary retention.^{14,25} Back pain, groin pain, and urinary retention leads to the use of analgesic medications and urinary catheterization which are associated with their own specific complications. To avoid complications resulting from the use of analgesic medications and urinary catheterization, nonmedical measures and nursing care are appropriate.¹⁰

Development of technology along with procedures requires appropriate medical and nursing care.^{22,23} Although there is much evidence for medical approach to care, little evidence exists to support the suggestions relating to management areas such as patient's position, the time of getting out of bed, and the time of removing sandbag which are generally related to the nursing activities territory.^{9,24–26} A recent literature review showed that caring of patients undergoing cardiac catheterization requires a revision in key areas of nursing care.^{19,22,25} Abdollahi et al¹⁴ (2013) reported that in addition to changes in body position and leaving the bed early, no vascular complications in patients undergoing coronary angiography was seen, whereas urinary retention in the control group was observed. Rezaei-Adaryani et al¹⁹ (2009) reported that patients whose positions were switched during the period of bed rest had experiences less fatigue but more comfort and satisfaction in the 3, 6, 8, and 24 hours after arrival to the postangiography ward. In addition, changes in body position had no significant impact on increased bleeding and hematoma compared with the control group.¹⁹ Heravi et al²⁷ (2013) comparing the patients in supine positions with the head angle of 0, 15, 30, 45, and 60 in separate groups reported that patients with head angle of 45° had experienced the lowest pain, so it was declared as the best position.

One of the nursing measures is changing the position of the patient who has undergone transfemoral angiography during bed rest, but it is avoided due to the fear of the vascular complications.

The effects of position change in patients after transfemoral angiography during bed rest will be evaluated as it relates to vascular complications. This study aimed to determine the effect of changing position on urinary retention, back pain, pain in the groin, and comfort of patients undergoing coronary angiography.

METHOD

The study is a single-blind randomized clinical trial in two groups which was approved by the Kurdistan University of Medical Sciences research Council. The study's proposal is registered at (www.irct.com) by the registration number IRCT2015091424018N1.

Sample size and sampling

The samples were chosen by convenience sampling method, and they were randomly allocated into control and intervention groups. The sample size with 95% confidence interval and 80% statistical power was estimated 60 patients (30 patients in the intervention group and 30 patients in the control group) (Figure 1).

Participants

Participants were patients undergoing coronary angiography. Inclusion criteria included nonemergency catheterization, age 18–65 years old, less than 180/100 mm Hg blood pressure, absence of active bleeding disorders, prothrombin time (PT), and partial thromboplastin time (PTT) of less than 16 and 90 seconds, respectively, consent to participate in the study, angiography via the femoral artery, no history of deep vein thrombosis (DVT) before the procedure, not being treated with thrombolytic (not taking streptokinase) and anticoagulant drugs (not taking warfarin), no history of diabetes with sensory problems, not taking any analgesic medications before the procedure, not suffering from peripheral arterial disease, no history of urinary problems, no history of allergy to contrast media, no dependency to drugs, lack of chronic low back pain, absence of blood and liver diseases. Exclusion criteria included needle entrance more than once to access the artery, cardiopulmonary resuscitation during angiography, movement disability, and disorder in the level of consciousness in a way that the patient can not cooperate to change position and incomplete termination of clinical intervention period.

Ethical considerations

This study was approved by the Research Council of Kurdistan University of Medical Sciences with the contract number 1035/31229/14 and was confirmed for ethical considerations by receiving the moral code muk.rec.1394.194 from the ethics committee of Kurdistan University. While explaining the purpose and method of study for the patients, informed consent was obtained from them.

Measuring tool

The instrument used to collect and record information in this was a three-part questionnaire which was designed according to the study.

The first part was demographic and clinical information form which contained information about age, height, weight, gender, marital status, education, occupation, history of smoking, diabetes, history of previous coronary angiography, systolic and diastolic blood pressure, body mass index, PT, PTT, international normalized ratio, and platelet count which was recorded based on the information contained in patients' medical records.

Patients' blood pressure was measured and recorded by one person using a mercury sphygmomanometer (ALP K2 model: no 300-VS; Tanaka Sangyo Co, Ltd, Tokyo, Japan) which was calibrated before the start of the study. Their height and weight were measured and recorded by one person using digital scales (Bermend BD7750) and centimeters. The second section contained procedural information form which contained the length

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