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TO ASSESS THE EFFECTS OF POSITIONING AND EARLY AMBULATION ON CORONARY ANGIOGRAPHY COMPLICATIONS -A REVIEW

Physiotherapy & Rehabilitation

Nilofar Rasheed*	Department of Physiotherapy, Noida International University, Greater Noida, India. *Corresponding Author
Abhishek Lachyan	Department of Social and Preventive Medicine, Faculty of Medicine, University Malaya, Kuala Lumpur, Malaysia.
Humaira Hanif (PT)	Metro Hospitals & Heart Institute Noida, India.
Bhawna Solanki	Department of Radiology, Noida International University, Greater Noida, India.
Anjali Chauhan	Department of Physiotherapy, Noida International University, Greater Noida, India.
Rudrabhan Singh	Gurudev Physiotherapy and Fitness Clinic, Ghaziabad, Uttar Pradesh, India.
Aishwarya Potnis	Baroda Heart Institute & Research Centre, Vadodara, Gujarat, India.
Shalini Sharma	All India Institute of Medical Sciences, New Delhi, India.
Salman Khan	School of Allied Health Sciences, Noida International University, Delhi NCR, India.

ABSTRACT

Purpose This study aimed to review the effect of positioning and early ambulation on coronary angiography complications. **Materials and Methods** A narrative review of the literature was performed by reviewing 61 articles with actual content based on inclusion/exclusion criteria. The articles were searched using various electronic databases like PubMed, Pedro, APTA, WHO, WCPT, Medscape, Scholar, Research-gate. The search strategy included RCTs, cross-sectional study and cohort study. **Results** We identified a total 920 references from the electronic search articles from various electronic databases, in which 110 articles were retrieved and assess. I have included 29 reviewed articles in total 1863 participants, with an individual study range. The study reported early ambulation also help to reduce vascular complication as there will be proper circulation of blood and also reduce the complain of patients over urinary retention as the metabolic activities of the body is intact **Conclusio** Early ambulation also helps to reduce vascular complication as there will be proper circulation of blood and also reduce the complain of patients over urinary retention as the metabolic activities of the body is intact and it's also eliminating the possible negative attitudes of patients with coronary angiography.

KEYWORDS

Angiography, Cardiac catheterization, early ambulation, vascular complications

INTRODUCTION

Cardiac catheterization [CC] is widely used for diagnostic evaluations in patients with cardiac diseases. Despite progressive improvements in noninvasive techniques, CC remains a key clinical tool for the assessment of anatomy and physiology of the heart and its associated vasculature. Currently, CC has become a routine diagnostic procedure performed in many hospitals in Iran. Although it can be performed through brachial, radial or femoral arteries, most (>95%) CCs are performed through the percutaneous femoral technique.1 However, CC is not entirely free from the risk of complications. Vascular complications such as bleeding, hematoma, distal embolization and arterial thrombosis are major complications after CC that could be resulted from a trauma to the femoral artery.2 Due to the potential vascular complications, all patients are restricted to bed rest in supine position with the affected leg immobilized for 6–24 h after the procedure to prevent bleeding from the groin site which usually occurs in 1-5% of patients. Bearing such a prolonged bed rest in supine position.3 However, it is difficult for many patients and it's often associated with discomfort for them.

Studies show that this type of positioning is based on tradition rather than on research. The most uncomfortable part of hospital administration for these patients is the time required to lie in flat position after procedure that often result in back pain and urinary retention.

Early ambulation and changing position in bed and reducing the length of bed rest may decrease patients' pain and significantly decrease the nursing staff work load, reduce in-hospital stay and also enable the patients to meet self-care need such as eating, drinking etc.

Many patients find it difficult with changing of position and ambulation after coronary angiography. To reduce possible vascular complications at the groin site, all patients are prescribed strict immobilization and bed rest in the supine position and manual or mechanical application of firm pressure above the puncture site is needed. Moreover, prolonged bed rest in recumbent position and immobilization of the affected leg are also required for those patients after sheath removal The involved leg is immobilized for 2–24 hours after the procedure to prevent vascular complications. Bleeding and hematoma are normally formed in the soft tissue of the upper thigh and disappear a few days after catheterization. It is therefore important to identify safe and feasible. Approaches to promote patient comfort without increasing the risk of vascular complications including hematoma and bleeding. The most frequent complaints from patients during prolonged bed rest are back pain and urinary discomfort4

METHODOLOGY

The rapid review was guided by five steps of Evidence-informed decision making (EIDM) approach recommended by Dr. Dobbin, Rapid Review Guidebook Steps for conducting a rapid review. Health Evidence™ tool was utilized for 1) searching for and access relevant research evidence; 2) appraising the methodological quality of research evidence; 3) synthesizing the evidence.

Search Strategies

The following key search terms were defined based on the rapid review research questions and a combination of different research domains namely "EFFECTS OF POSITIONING" & "EARLY AMBULATION ON CORONARY ANGIOGRAPHY COMPLICATIONS". Search terms have been expanded by keywords and synonyms of ASSESS/Complication. To improve the quality and unbiasedness of the search, wildcards have been used.[5]

The final search string is as below:

("ASSESS THE EFFECTS OF POSITIONING "OR "EARLY AMBULATION ON CORONARY ANGIOGRAPHY COMPLICATIONS" OR" Factors associated with EFFECTS OF POSITIONING)

Four databases namely SCIENCE DIRECT, PUBMED, GOOGLE SCHOLAR, and COCHRANE library have been adopted for systematic search of publication. PubMed, Google Scholar and Cochrane library offered a good coverage of peer-reviewed articles, while SCIENCE DIRECT has been included to have a broader coverage of the grey literature in view of the scarcity of publication. The literature search was also supplemented with a snowball searching to pursue references of reference involving the review papers.

Search Strategy:
Relevant articles were identified by engines such as SCIENCE DIRECT, PUBMED, GOOGLESCHOLAR, and COCHRANE DATA BASE OF SYSTEMATICREVIEW (www.cochrane.org), and CINALE.Website like physiopedia (www.physiopedia.com) was searched and published texts were `also reviewed in these studies. A review of the articles was conducted and PRISMA guidelines flow chat was used to briefly explain the research methodology. PRISMA Means Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

Eligibility criteria
Literature search covered all ASSESS THE EFFECTS OF POSITIONING AND EARLY AMBULATION ON CORONARY ANGIOGRAPHY COMPLICATIONS articles, theses and review papers published before July 2021; studies conducted in developing countries based on the World Bank check-list and were restricted to English language publications. Publications that describe the development of the conceptual framework of ASSESS THE EFFECTS OF POSITIONING AND EARLY AMBULATION ON CORONARY ANGIOGRAPHY COMPLICATIONS, policy development, and determinants of the usage, issues and challenges of using Patient Satisfaction have been excluded from data extraction.

Data Extraction
Two independent reviewers from the university fraternity have been involved in reviewing the articles to ensure the non-bias of the selection. Both reviewers have reached eighty per cent in agreement on the finalized list of articles for further data extraction. Given the limited publication and diversity in the methodology as studies were done by various field experts. The grading of the quality was based on Level of Evidence.

Results of the literature search
After the preliminary screening process, non-relevant articles were screened based on non-English language, title, abstract and chapter of a book, a total of 110 articles have been reduced to potentially relevant articles of 29 articles. Based on the inclusion criteria, a total of 29 studies have been conducted in developed countries and 29 papers from developing countries were included for final extraction of the data.6

AIMS OF STUDY
This study aimed to review the effect of positioning and early ambulation on coronary angiography complications.

OBJECTIVE OF THE STUDY
The objective of this study is to review the effect of changing position and early ambulation on low back pain, urinary retention, bleeding and hematoma after coronary angiography complications.

Significance Of Study
To check the effect of changing position and early ambulation on coronary angiography complications. This will help to reduce complications that occur after coronary angiography such back pain, urinary retention, bleeding and hematoma.

Hypothesis
Directional Hypotheses

Statement Of Problem
A review of literature (I.e. effect of positioning and early ambulation on coronary angiography complications) was conducted in order to provide a review of the current state of poisoning and early ambulation on coronary angiography complications.[7]

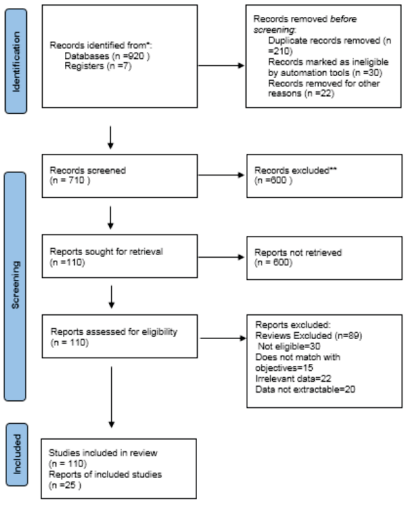

Fig.1 The Review has done according to PRISMA.

Summary of the included studies:
Chair, S.Y., Taylor-Piliae, R.E., Lam, G., Chan, S., et al in 2003 conducted an experimental design with patients randomly assigned either to a control or experimental group. The control group received the usual care, remaining supine and flat for 8-24 hours, with the affected leg straight. The experimental group changed their body position hourly, varying between supine, right side-lying, and left side-lying during the first 7 hours after coronary angiography.[8]

A total of 419 patients participated in the study (control, n = 213; experimental, n = 206). Regardless of group assignment, back pain intensity increased with longer time on bedrest. In addition, the control group reported higher levels of pain at all five assessment times. Vascular complications in terms of bleeding at the femoral site were not significantly different between the control and experimental groups.[9]

The study findings suggest that patients may be able safely to change their position in bed earlier in the post-coronary angiography period than currently recommended in practice protocols. Changing position in bed may also reduce back pain, promote physical comfort, and possibly reduce patients' negative feelings toward coronary angiography.[10]

Morteza Rezaei-Adaryani et al, 2009 retrospectively investigated sample of 70 patients, who had undergone a non-emergency 6-French cardiac catheterization via the femoral artery from September to November, 2006. In a single-blind randomized controlled trial, each patient was randomly assigned to either the control or experimental group. The patients' position in the experimental group was intermittently changed during the first 6 h after catheterization. Seven hours after the procedure, they were allowed to be ambulated and to undertake their self-care activities. A pillow was placed under the patients' bodies. Patients in the control group were managed as routine; they were restricted to a 10–24 h bed rest bed rest in supine position with the affected leg straight and immobilized and a sand bag on the puncture site for at least 8 h. The levels of comfort, satisfaction and fatigue, and the amount of bleeding and hematoma were measured at regular intervals after the procedure.[11]

The patients in the experimental group had significantly higher comfort and satisfaction and lower fatigue levels than the control group at 3, 6, 8 h and the next morning after catheterization ($P < 0.01$). Changing patients' position according to the current protocol in the experimental group produced no significant increase in the amount of bleeding and hematoma when compared with the control group ($P > 0.05$).[12]

The results of this study showed that the levels of comfort, satisfaction and fatigue after catheterization are related to the duration of bed rest and patients' position in bed. Changing patients' position accompanied by early ambulation after cardiac catheterization are associated with increasing comfort and satisfaction levels and decreasing the level of fatigue without increasing the amount of bleeding and hematoma.

Hansen BS et al., 2011 has conducted an ultrasound-determined bladder volume ≥400 ml at arrival in the recovery room was used to define POUR. Multivariate regression analysis was used to identify patient and system factors linked to POUR in 773 consecutive hospitalized patients who had undergone orthopedic, abdominal, and gynecological or plastic surgery without an indwelling urinary catheter.[13]

We found the incidence of POUR to be 13%. The lack of pre-operative voiding, use of regional anesthesia, anesthesia time >2 h and emergency surgery were all independent risk factors for POUR.

The detected incidence of POUR at arrival in the recovery room was rather high but had easily identifiable risk factors. We recommend pre-operative voiding whenever possible. Routine bladder scanning at arrival in the recovery room should be considered, especially after spinal anesthesia, emergency surgery or when the anesthesia time exceeds 2 h.[14]

Rosenstein, G., Cafri, et al in 2004 had used the femoral approach, post-procedure bed rest of 4 to 6 hours is recommended to prevent groin complications. This extended strict bed rest is associated with patient discomfort and increased medical costs, and interferes with more efficient catheterization laboratory management of referred outpatients. Accordingly, we tested a simple clinical approach to identify low-risk patients who may benefit from ambulation within two hours after sheath removal. Ninety-eight outpatients were stratified to early (time=1.5 to 2.0 hours; n=74) or conventional ambulation (time=4 to 5 hours; n=24) based on difficulties in obtaining arterial access, presence of oozing or hematoma after completing manual compression. Ecchymosis was the most frequent complication, noted in one early ambulated and three conventionally ambulated patients at hospital discharge and in eleven early ambulated and six conventionally ambulated patients at one-week follow-up. No large hematomas, retroperitoneal bleeding or need for blood transfusion occurred in any patients. Using simple clinical parameters, most outpatients who undergo elective diagnostic catheterization may benefit from safe early ambulation.[15]

Rolley JX et al in 2010 his study describes the practice standards and priorities of care of cardiovascular nurses in Australia and New Zealand. A 116-item Web-based survey was administered to cardiovascular nurses, via electronic mail lists of professional cardiovascular nursing organizations, using a secure online data collection system. Data were collected from March 2008 to March 2009. A total of 148 respondents attempted the survey, with 110 (74.3%) completing all items. All respondents were registered nurses with an average of 12.3 (SD, 7.61) years of clinical experience in the cardiovascular setting. A range of practice patterns was evident in ambulation time after percutaneous coronary intervention, methods of sheath removal, pain relief, and patient positioning. Respondents consistently rated psychosocial care a lower priority than other tasks and also identified a knowledge deficit in this area.

This survey identified diversity of practice patterns and a range of educational needs. Increasing evidence to support evidence-based practice and guideline development is necessary to promote high-quality care and improved patient outcomes.[16]

Steffenino, G et al in 2006 had performed randomized quasi–experimental study in 120 patients for coronary angiography. The patients were randomly divided into experimental and control groups. Primarily demographic data were obtained from both groups before intervention was carried out for them. The arterial sheath was removed immediately after the procedure. Hemostasis was achieved by manual compression and maintained with sandbags. Early ambulation was attempted after two hours of supine bed rest following sheath removal. The incidence of bleeding and insertion site complications was documented at 24 hours and subsequently at 30 days post-procedure. His study findings were indicative of no significant difference between the two groups in terms of gender, age, body mass index, catheter size, total procedure duration, total hemostasis time, history of anticoagulant drug use, and coagulation tests before angiography. Pre-ambulation bleeding occurred in 2 patients in each of the two groups. Post-ambulation bleeding occurred in 2 patients in the control group and 1 in the experimental group. Whereas there was no incidence of large pre-ambulation hematoma in the control group, there was one case in the experimental group. There was no case of post-ambulation hematoma, however, in either group, and nor was there any late bleeding or vascular complication. Therefore, He concluded that an early ambulation protocol can shorten hospital stay without significant vascular complications.[17-23]

RESULTS:

I have identified 920 references from the electronic search, in which 110 articles were retrieved and assess. I have included 29 reviewed articles in total 1863 participants, with an individual study range.

I have not checked the possibility of selective report in the studies because I did not have access to the study protocols.

DISCUSSION

It has been presented at several studies that change position in bed reduces the backache intensity. Changing the position is one of the nursing tasks which be used as one of the noninvasive and non-pharmacological solutions to relieve pain. In addition, backache is caused tension of the pain-sensitive structures that press or stimulate the nerve endings which may be directly associated with continuous period of immobility or tension of the lower spinal ligaments.

The results of the research by Chair et al., conducted to review the impact of change position on the backache after angiography and illustrated that backache intensity in the intervention group has been significantly less than the control group. Study of Pollard et al., also showed that the increase of bed angle after one hour with early ambulation after 2.5 hours is similar in safety comparison with the increase of bed angle after 4.5 hours.[24-25]

The study of Yalmaz et al. titled "minimizing short-term complications in patients undergoing cardiac invasive procedures "that investigated the effect of change position and sand bag on complications, indicated no significant difference between the groups in vascular complications and the patients whose position were changed and their beds were raised, reported lower backache that is consistent with our study; also from the second hour, intensity of back pain showed significant differences between the groups that is inconsistent with the present study.

In respect of the urinary retention problem, the results of the research by Neishaboori in his study, Neishaboori demonstrated that five subjects (7.7%) in the control group and eight subjects (12.3%) in the intervention group reported urinary difficulty during first 6 hours after cardiac catheterization. The Boztosun et al., had investigated the effect of early ambulation after the diagnostic cardiac catheterization, in patients who had been out of bed 2 hours after the procedure, 12 patients (7%) developed a hematoma and 25 patients (16%) had minor bleeding after ambulation. According to Pollard et al., in the group of patients who were ambulated 4.5 hours after the procedure, the incidence of vascular complications was 14.9% and in patients who were ambulated 2.5 hours after angiography, 19.2% reported.[26-27]

CONCLUSION

According to the presented protocol, it is safe and feasible to change the patients' position and to permit early ambulation after coronary angiography. In addition, body change position prevents a backache and reduces its intensity and consequently increases a physical comfort.

It also eliminates the possible negative attitudes of patients towards coronary angiography. Moreover, this positioning method avoid wasting therapist time on explaining the reason of patients' complete bed-rest, prescribing analgesics as well as massaging the patient's back in order to relieve the pain.

Early ambulation also helps to reduce vascular complication as there will be proper circulation of blood and also reduce the complain of patients over urinary retention as the metabolic activities of the body is intact.

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