

Impact of Early Ambulation after Femoral Approach Coronary Intervention (FACI) on Patient's Outcome

Anchal Gupta¹, Dr. Suchana Roy Bhowmik²
Dr. Rishi Sethi³

¹(Medical Surgical Nursing, KGMU, College of Nursing/ King George's Medical University, Lucknow, India)

²(Medical Surgical Nursing, KGMU, College of Nursing/ King George's Medical University, Lucknow, India)

³(Department of Cardiology, KGMU / King George's Medical University, Lucknow, India)

Abstract:

Background: Cardiovascular diseases are group of non-communicable disease burden not only in India but also globally. Technological advancement has important role in early diagnosis and treatment of cardiovascular diseases. Among those procedures, coronary angiography and angioplasty are helpful in diagnosis and treatment of coronary diseases. Early ambulation after this procedure improves patient outcomes and reduces cost of hospital stay. The purpose of the study was to assess impact of Early Ambulation after Femoral Approach Coronary Intervention (FACI) on patient outcome.

Materials and Methods: Quasi-experimental (nonequivalent post test control group design) was applied. Purposive sampling technique was used to select 70 patients (35 in each control and study group) who met inclusion criteria. Early ambulation was initiated to study group while control group received hospital routine care. Patient outcome was assessed by Numerical Pain Rating Scale, Bleeding assessment tool, Hematoma assessment femoral scale, Urinary retention assessment scale and Satisfaction measurement tool. Data were collected at the end of 6 hour of intervention.

Results: The result shown that there was statistically significant impact of early ambulation found on back pain ($p < 0.001$), urinary retention ($p = 0.006$) and level of satisfaction ($p < 0.001$). There was no statistically significant impact of early ambulation on bleeding ($p = 0.513$) and hematoma ($p = 0.513$) was noticed.

Conclusion: There was no significant effect found on bleeding and hematoma formation, so this study concluded that early ambulation was effective on reducing back pain, relieving urinary retention and increasing satisfaction level. Hence Early Ambulation after Femoral Approach Coronary Intervention (FACI) may be recommended as part of routine nursing care in the hospital.

Key Word: Early ambulation intervention; Back pain; Bleeding; Hematoma; Urinary retention; Satisfaction.

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I. Introduction

Cardiovascular diseases are a group of non-communicable disease burden not only in India but also globally. The non-communicable disease account for 41 million deaths in each year which corresponds to 71% of all death globally.¹ Technological advancement has made a major contribution to the early diagnosis and treatment of cardiovascular diseases. Among many coronary procedures, coronary angiography and angioplasty have major role in early diagnosis and treatment of blocked arteries. After these procedures, early treatment and fast recovery are the primary goal for the patient. Femoral artery puncture is assumed to be the standard technique used to access the coronary arteries during angiography and angioplasty.² Due to femoral approach, patients are confined to bed for longer period. So, this prolonged bed rest result in physical discomforts, like lower back pain and complications related to digestion and excretion. Prolonged bed rest also contribute in an extended hospital stay, which increases both medical fees and usage of medical resources.³ Practicing evidence-based findings (early ambulation) reduces subjective complaints of the patient like back pain and voiding difficulty.⁴ So, based on above findings the study was carried out with the purpose to assess the impact of Early Ambulation after Femoral Approach Coronary Intervention (FACI) on patient's outcome.

II. Material And Methods

The study was conducted in Cardiac Catheterization I.C.U, Lari, (Department of Cardiology) KGMU, Lucknow, Uttar Pradesh, India. Data collection was done from November 2019- January 2020. A total of 70 patients were selected for study.

Study Design: Quasi-experimental (nonequivalent post test control group design)

Study Location: The study was conducted in cardiac catheterization ICU, IARI, (Department of Cardiology) KGMU, Lucknow, Uttar Pradesh, India.

Study Duration: November 2019- January 2020.

Sample size: 70 patients (35 in each control and study group).

Sample size calculation: The sample size is calculated on the basis of variation in pain score of 4th hr in two group study using the formula:

$$n = \frac{(z_{\alpha} + z_{\beta})^2 (\sigma_1^2 + \sigma_2^2)}{d^2}$$

The pain score taken were $\sigma_1 = 2.01$, $\sigma_2 = 2.58$.⁷ Type I error $\alpha = 5\%$ corresponding to 95% confidence level and Type II error $\beta = 10\%$ for detecting results with 90% power of study was taken. So the required sample size was $n = 35$ each group. The total calculated sample size was 70.

Subjects & selection method: The sample of the study was the patient who had undergone coronary angiography and coronary angioplasty through femoral approach admitted in Cath ICU, who met the inclusion criteria and agreed to participate were included as a sample in this study.

Inclusion criteria:

1. Undergone angiography and angioplasty through femoral approach.
2. Age above or equal to 18 years.
3. Gave consent for study.

Exclusion criteria:

1. Any approach other than femoral.
2. Any musculoskeletal disabilities leading to improper gait.
3. Seriously ill after or during procedure.
4. History of back pain and urinary discomfort.
5. History of any urinary disorders.

Procedure methodology

The researcher obtained ethical clearance from the Institutional Ethical committee of King George's Medical University (Registration no.: ECR/262/Inst/UP/2013/RR-16) before initiating the study. In this study the tools used to illustrate patient's outcome were: - 1. Demographic profile contains 4 items (based on Kuppaswamy scale 2018.⁵), 2. Clinical profile contains 8 items. 3. Standardized Numerical pain rating scale ($r=0.96$) was used to assess the level of pain with 11 point numeric scale ranges from '0' representing no pain to '10' representing extreme pain, 4. Bleeding assessment tool (reliability could not be obtained because of few items) with 4 items to check bleeding at puncture site. 5. Standardized modified femoral scale classification of trans-femoral related access related bleeding in percutaneous coronary intervention used to check hematoma at femoral site by researcher that contain total of 5 items.⁶ 6. Urinary assessment tool was used to check urinary retention with 2 items (reliability could not be obtained because of few items). 7. Patient satisfaction 5 point likert scale with 16 items ($r=0.708$). After obtaining ethical clearance the researcher obtained administrative permission from Head of Department of Cardiology. Researcher introduced herself to cath ICU and explained the purpose and objectives of study and obtained written consent from participants. Then the participants were enrolled as per the inclusion criteria in the study and control group. Early Ambulation was initiated after Femoral Approach Coronary Intervention (FACI) to study group and for control group hospital routine were followed. The intervention was as follows; initially for first 2 hour participants were given supine position after sheath removal. After 2 hours of FACI, participant's head of bed was elevated to 45°. After 3 hours of FACI, participant's head of bed was elevated to 90°. After 4 hours of FACI, participant was moved from bed to chair. After 5 hours, participant was allowed to ambulate in the corridor of cardiac catheterization ICU for 10 min, afterward comfortable position was provided as per demand of participant. After 6 hours of femoral approach coronary intervention, data collection was done from both study and control group.

Statistical analysis

The analysis of data was done on the basis of objectives, hypothesis testing. In this study descriptive and inferential statistics was used like chi square and Mann Whitney test. The p value of <0.05 was considered as significant.

III. Result

The results of the study were as follows:-

Table 1: Comparison of impact of Early Ambulation after FACI on back pain among study and control group n=70

Parameters	Control group		Study group		Mann Whitney Test	
	Mean	SD	Mean	SD	z-value	p-value
Back pain	2.20	1.51	0.14	0.43	6.44	<0.001

Mann Whitney *p<0.001

Table 1:- depicted that there was significant difference found in the level of back pain in study group with mean 0.14±0.43 as compared to control group mean 2.20±1.51 with p value <0.001. So, above result showed that there was reduction in the back pain level in study group after initiating early ambulation which accepts the research hypothesis that there was significant impact of early ambulation after FACI on patient's outcome between study and control groups.

Table 2:-Comparison of impact of Early Ambulation after FACI on Urinary Retention among study and control group n=70

Parameter	Control group	Study group	chi square	p- value
Urinary retention	n ₁ =35 Frequency (%)	n ₂ =35 Frequency (%)		
Not voided	14(40.0%)	4(11.4%)	7.48	0.006
Voided	21(60%)	31(88.6%)		

Chi Square* p<0.05

Table 2:-showed that in study group 88.6% had voided urine whereas in control group 60% had voided urine. The significant difference was observed with the p value 0.006. So, above findings illustrated that early ambulation was beneficial in reducing urinary retention and helping patients in voiding urine which accepts the research hypothesis that there will be significant impact of early ambulation after FACI on patient's outcome between study and control group.

Table 3: Comparison of impact of Early Ambulation after FACI on patient satisfaction between study and control group n=70

Parameter	Control Group		Study Group		Mann Whitney Test	
	Mean	SD	Mean	SD	z-value	p-value
Satisfaction	59.91	10.93	72.37	4.62	5.86	<0.001

Mann Whitney *p <0.001

Table 3 showed that average satisfaction in study group is 72.37±4.62 as compared to control group was 59.91±10.93. The significant difference was observed with the p value <0.001.

So, above findings illustrated that early ambulation was beneficial in improving satisfaction level which accepts the research hypothesis that there will be significant impact of early ambulation after FACI on patient's outcome between study and control group.

The study also assessed bleeding and hematoma formation at puncture site. In this study the result shown that there was no significant difference found in bleeding at the punctured site with the p value 0.513 and formation of hematoma at the punctured site with the p value 0.513 between study and control group.

IV. Discussion

The result of the study found that Early Ambulation after Femoral Approach Coronary Intervention (FACI) had significant impact on reducing back pain, improving in voiding of urine and increasing patient satisfaction whereas there was no significant impact found bleeding and hematoma at the puncture site.

Similarly studies support that early ambulation has low incidence of development of back pain, vascular complication and lesser chances of developing urinary retention.^{7,8,9}

V. Conclusion

From the finding of the study, it has been observed that Early Ambulation after Femoral Approach Coronary Intervention (FACI) had beneficial in reduction of back pain, improving in voiding of urine and increasing patient satisfaction without increasing chances of vascular complications. So, based on above findings Early Ambulation after Femoral Approach Coronary Intervention (FACI) may be recommended as part of routine nursing care in the hospital which will improve patient outcome.

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