FEMORAL VASCULAR COMPLICATIONS;
THE EFFECT OF POST ANGIOGRAPHY BED - REST DURATION ON FREQUENCY OF COMPLICATIONS

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ABSTRACT… Background: Coronary angiography is the most important and reliable test to diagnose coronary artery disease. Bed rest of few hours is advised after angiography to reduce vascular complications but there is difference of opinion regarding duration of bed rest after angiography. **Objectives:** To compare the frequency of vascular complications after 6 hours of bed rest versus 3 hours of bed rest in patients undergoing femoral coronary angiography. **Study Design:** Experimental study. **Place and Duration of Study:** Angiography Department, Faisalabad Institute of Cardiology, Faisalabad from August, 2017 to January, 2018. **Methods:** A total of 100 patients were divided in two equal groups, group A (interventional group (n=50), 3 hours rest) and group B (routine care (n=50), 6 hours rest). A 6 French sheath was inserted under local anesthesia by seldinger technique in femoral artery. Coronary angiography was done using 6 F angiography catheters. At the end of procedure sheaths were immediately removed and manual pressure was applied for 15 minutes. Puncture site was observed for hematoma formation or bleeding every 30 minutes for 2 hours in angiography ward, afterwards these observations were made every hour till time of discharge. Patients were called for checkup in outpatient department next day and after 1 week. **Results:** Out of 50 patients in group A there were 35 (70%) male and 15 (30%) female and in group B out of 50 patients there were 40 (80%) male and 10 (20%) female patients. In group A mean age was (51.02 ±9.57) years while in group B mean age was (51.50±10.19) years. There was no significant difference in patients between the two groups regarding their age, gender, body mass index (BMI), coagulation profile and use of antiplatelets. There was no incidence of pre ambulation bleeding, small or large hematoma in both groups. Post ambulation bleeding occurred in 1(2%) patient in experimental group (Group A) and in 1 (2%) patient in the control group (Group B). Small hematoma occurred in 2 (4%) patients in experimental group (Group A) and in 1(2%) patient of control group (Group B). There was no incidence of post ambulation large hematoma in both groups. **Conclusion:** Short bed rest of 3 hours after femoral angiography does not increase the frequency of puncture site complications.

Key words: Coronary Angiography, Early Ambulation, Bed Rest.

INTRODUCTION

Coronary artery disease is the leading cause of mortality worldwide. There are several tests to diagnose coronary artery disease including exercise tolerance test, stress thallium scan, stress echocardiography, CT coronary angiography and invasive coronary angiography. However coronary angiography is the gold standard test for diagnosing coronary artery disease.[1] It can be done using different routes but femoral artery is the commonest route used for invasive coronary angiogram. Use of femoral artery as access point has many advantages like easy and quick engagement of coronary arteries.[2] It can be used again and again for repeat procedure. However it has certain limitations like bleeding and hematoma formation especially in overweight patients. Patients are usually advised bed rest after femoral angiography to decrease chances of bleeding and hematoma formation but there is difference of opinion regarding duration of bed rest.[3] Long bed rest increases patient discomfort, increases hospital bed occupancy and reduces the number of procedures which can be done in one day.[4]

Although radial artery route is considered to overcome these above said problems but different studies have shown that radial route is associated with increased fluoroscopic time and high volume of contrast use.[5] Another alternative is the use of haemostatic devices to get early ambulation after femoral angiography but these are costly and increase economic burden on patients.[6] Many studies have shown that shorter bed rest is equally safe after femoral angiography.[4,7-8] A previous meta-analysis has shown that 2 hours and 6 hours of bed rest after angiography are associated with similar (6-8%) bleeding risk.[8-9]

Early discharge can create more beds and more patients can be accommodated. There are no studies in existing literature those have tested the effect of duration of bed rest after femoral artery coronary angiography on vascular complications in Pakistan. The objective of this study was to compare the frequency of vascular complications after 6 hours of bed rest versus 3 hours of bed rest in patients undergoing femoral arterial coronary angiography.

OPERATIONAL DEFINITIONS

VASCULAR COMPLICATIONS
Vascular complications mean bleeding or hematoma formation post angiography.

Bleeding
Blood loss from femoral puncture site which requires repeat manual pressure to stop it or the need to transfuse blood.

Hematoma
Palpable soft tissue swelling at the site of femoral puncture. Small hematoma is less than 5×5cm and large hematoma is bigger than this.

MATERIAL AND METHODS
This was an experimental study conducted in Angiography Department of Faisalabad Institute of Cardiology, Faisalabad. A total number of 100 patients were enrolled in this study

INCLUSION CRITERIA
1. All patients coming for elective coronary angiography on a single consultant list (To control operator differences) who are eligible for femoral route.
2. Single puncture of femoral artery.

EXCLUSION CRITERIA
1. Severe Hypertension (>180/100)
2. If hematoma is present at the time of sheath removal
3. Chronic obstructive pulmonary artery disease
4. Left main stenosis >50%
5. Patient who required ICU transfer post angiography
6. Known bleeding disorder
7. Chronic renal failure

DATA COLLECTION
Patients were randomized into two equal groups by lottery method, group A (interventional group, 3 hours bed rest) and group B (routine care, 6 hours bed rest). Informed and written consent was taken from all patients. Femoral artery was punctured using seldinger technique and 6 French sheaths inserted under local anesthesia. Coronary arteries were engaged with Judkin 6F catheters. Unfractionated heparin 2500 units IV bolus was given. At the end of procedure sheaths were immediately removed and manual pressure applied for 15 minutes. Sterile dressing applied over puncture site. Puncture site observed for hematoma formation or bleeding every 30 minutes in angiography ward for two hours. After this, observations were made every hour till time of discharge. Patients were called for checkup in OPD next day and after 1 week.

STATISTICAL ANALYSIS
The data was analyzed using the Statistical Package for Social Sciences (SPSS, version 21). Continuous variables were analyzed using student's t-test and were presented as means ± standard deviation. Nominal variables were analyzed using Chi-square test and expressed as percentages. P-values of less than 0.05 were considered statistically significant.

RESULTS
A total of 100 patients, who met the inclusion and exclusion criteria were divided into two groups

	Group1	Group 2	P-value
Age (Years)			
Mean ± SD	(51.02 ±9.57) years	(51.50±10.19) years	0.97
Gender:			
Male	35(70%)	40(80%)	0.34
Female	15(30%)	10(20%)	
BMI (kg/m2)	26.33±2.80	26.20±2.09	0.29
PT (sec)	12.41±1.90	12.55±1.65	0.28
APTT (sec)	33.91±4.33	34.90±4.31	0.58
Platelet count	220523±71510	221032±68000	0.41
Use of antiplatelets	48(96%)	48(96%)	0.69
Table-I. Patients characteristics **BMI = Body mass index, PT = Prothrombin time, APTT = Activated partial thromboplastin time**			

	Group A	Group B	P-value
Pre ambulation			
Bleeding	0	0	
Small hematoma	0	0	
Large hematoma	0	0	
Post ambulation			
Bleeding	1(2%)	1(2%)	0.66
Small hematoma	2(4%)	1(2%)	0.55
Large hematoma	0	0	
Table-II. Vascular complications			

each having 50 patients (Group A, interventional group, 3 hours bed rest) and (Group B, routine care group, 6 hours bed rest). In group (A) out of 50 patients 35 (70%) were male and 15 (30%) were female while in group (B) out of 50 patients 40 (80%) were male and 10(20%) were female patients. In group A mean age was (51.02 ±9.57) years while in group B mean age was (51.50±10.19) years (Table-I).

There were no statistically significant differences in terms of gender, age, body mass index, catheter size, total hemostasis time and coagulation tests pre-angiography between the two groups (Table-I).

There were no pre-ambulation vascular complications regarding bleeding, small or large hematoma formation between the two groups. Post-ambulation bleeding occurred in 1 (2%) patient in group A and also in 1 (2%) patient in group B. In group A out of 50 patients 2 (4%) patients developed small hematoma (a palpable mass < 5×5 cm) while out of 50 patients in group B only 1 (2%) patients had small hematoma formation. There was no case of post ambulation large hematoma (a palpable mass > 5x5 cm)

in both groups. The incidence of vascular complications before and after ambulation did not differ significantly between the two groups (Table-II).

DISCUSSION

This is first study of its kind in Pakistan which shows that short bed rest of 3 hours after femoral angiography is safe and does not increase the chances of vascular complications compared to standard 6 hours of rest. Our study results are similar to previously done studies. Rosenstein et al[4] study showed equal complications rates after 6 French diagnostic heart catheterizations in patients who were mobilized 2 hours after sheath removal compared to those who started mobility 6 hours after sheath removal. In a study done by Koch et al[3] showed that early ambulation is safe after percutaneous angioplasty and 6F catheters. Alarcan et al[10], Wangs et al[11], Tagney and Lackie[12] and Tengiz et al[13] demonstrated that early mobility is safe not only after diagnostic but also after therapeutic procedures. Gianakos et al[14] in a pilot study also showed that 2 hours of bed rest is safe when compared with 4 hours of

bed rest in electrophysiological procedures. They showed that the incidence of bleeding did not differ significantly between the two groups.

Vlasic et al[15] reported that the patients with coronary interventions done through femoral route can easily move after 2 hours once hemostasis is secured. Similarly a randomized trial done by Augustin AC et al[16] showed that early ambulation after PCI was safe compared to conventional 4 hours of bed rest and was associated with patient comfort. Although we did not measure patient`s comfort objectively but a study has shown that longer bed rest after femoral angiography increases the chances of back pain and patient`s negative feeling about angiography. If patients are allowed to change their position hourly it does not increase the chances of vascular complications.[17-19]

CONCLUSION
Based on the results of our study we can conclude that patients can be safely mobilized after 3 hours of femoral angiography. This can add to the patient comfort and early discharge from the hospital.

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> *Don't let a bad day make you feel like you have a bad life.*
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> **– Unknown –**

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3	Liaqat Ali	Manuscript writing.	