Acta Biomed 2026; Vol. 97, N. 1: ISSN: 0392-4203 | eISSN: 2531-6745

Factors associated with Vascular complications in individuals undergoing Cardiac catheterization

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ABSTRACT

Background: According to the guidelines of the American College of Cardiology, the rate of problems following cardiac catheterization should not exceed 1% for diagnostic procedures and 3% for interventional operations. The most common form of cardiac catheterization problems are vascular. They may result in lower patient outcomes, longer hospital stays, increased hospital costs, and increased patient discomfort. **Aim:** The aim is to study the risk factors and vascular complications among patients undergoing cardiac catheterization. **Objective:** Patient details, including age, sex, body mass index (BMI), and laboratory tests, were gathered together with medical history and vascular complication assessment data. Patients undergoing cardiac catheterization should have their risk factors and vascular problems evaluated. **Methods:** Assessed the vascular problems of male and female patients with coronary artery disease at Aarupadai Veedu Medical College and Hospital in Puducherry using a Prospective cross - sectional observational research. **Result:** The mean age of the study population was 52 ±11 years. Out of 33 study populations, 23% of participants are accessed through the femoral artery, and 77% of participants are accessed through the Radial artery. Most of the vascular complications are detected in the Femoral artery. Conclusion: Femoral oozing is a common mild vascular issue, it can be inferred. But following sheath removal, a hematoma was a frequent serious vascular consequence. Totally 12% of patients were complicated after the procedure. Of these 12%, 3% of patients were accessed through the radial site, and 9% of patients were accessed through the femoral site. Old age and female sex are common risk factors for both minor and substantial vascular problems following diagnostic and therapeutic cardiac catheterization operations.

Keywords: Cardiac catheterization, Risk factors, vascular complications

Introduction: Guidelines from the American College of Cardiology state that the rate of cardiac catheterization issues should not be more than 1% for diagnostic procedures and 3%

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for interventional operations. Vascular abnormalities are the most prevalent kind of cardiac catheterization issues, and they can lead to worse patient outcomes, more discomfort, longer hospital stays, and greater hospital expenses [1]. If adequate pressure is not manually applied using a mechanical compression device or vascular closure devices, vascular complications may arise, including retroperitoneal bleeding, pseudoaneurysm, arteriovenous fistula formation, and bleeding at the access site, such as hemorrhage at the sheath site [2]. Anticoagulant drugs, repeated procedures, aging, and often using the same vascular access site are the main causes of vascular problems, according to prior studies. Swelling surrounding the puncture site, palpable hardening under the skin, and change in the size of the bilateral groin areas are the primary signs of vascular problems. Groin discomfort can also happen when you're at rest or when you move your legs. Depending on how bad it is, it can lead to a drop in hemoglobin, an increase in blood pressure, and a decrease in heart rate. Many hematomas may go away in a few weeks when the blood is absorbed into the tissue [3]. Finding risk factors associated with vascular issues has been the focus of numerous investigations. Obesity, concurrent conditions including hypertension or renal failure, sex (female), advanced age, large sheath use, extended sheath time, and excessive coagulation are some of these factors [4].

Ethics statement

This study's aims and objectives were thoroughly reviewed by the Institutional Human Ethics Committee (IHEC) along with the tool used for data collection. The IHEC gave its NOC on 07/06/2024 to execute this study.

Methods

This prospective cross-sectional observational study was conducted in the Department of Cardiology at Aarupadai Veedu Medical College and Hospital, Puducherry, over one month. The sample size of 33 was arrived at based on the formula for cross-sectional studies. The samples were collected consecutively as patients arrived at the Cardiology department. The aim is to study the risk factors and vascular complications among patients undergoing cardiac catheterization.

After doing a literature study, the researcher created two tools that were utilized to gather the data. The following tools were incorporated in the design:

Medical data assessment: It was divided into two sections: (a) demographic data, which contained information on age, sex, and occupation and (b) medical data history, which included comprehensive information on medical history, laboratory tests, current and previous medical care, and procedure-related details.

Observational checklist of vascular complications: The researcher used a review of the literature to create this checklist. Hematoma, hemorrhage, and other problems associated with cardiac catheterization and percutaneous coronary intervention (PCI) were covered.

Results

It can be a result that femoral oozing is a common minor vascular complication. However, a hematoma was a common major vascular complication after sheath removal. Totally (n=4)12% of patients were complicated after the procedure. Of these 12%, (n=1) 3% of

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patients were accessed through the radial site and (n=3) 9% of patients were accessed through the femoral site. Old age and female sex are common risk factors for both minor and substantial vascular problems following diagnostic and therapeutic cardiac catheterization.

Discussion

The study included a total of 33 CAD patients. The majority of participants were male (55%), followed by females (45%). The demographic data of the patients under study revealed their percentage distribution. It showed that the majority of the individuals under study were between the ages of 50 and 59. In the study, 55% of the studied patients were men. Among the studied 33 patients, the most vascular complications were in females. In this study, 23% of participants were accessed through the femoral artery, and 77% of participants were accessed through the radial artery. Most of the vascular complications are detected in the Femoral artery. In this study of 33 participants, complications were detected in 4 participants. The occurrence of minor vascular problems following diagnostic and therapeutic cardiac catheterization, such as femoral oozing and hematoma formation following sheath removal by manual compression for 15–30 minutes, was examined in our study.

Conclusion

Femoral oozing is a common mild vascular issue, it can be inferred. But following sheath removal, a hematoma was a frequent serious vascular consequence. Totally 12% of patients were complicated after the procedure. Of these 12%, 3% of patients were accessed through the radial site, and 9% of patients were accessed through the femoral site. Old age and female sex are common risk factors for both minor and substantial vascular problems following diagnostic and therapeutic cardiac catheterization.

Conflict of interest: The authors have declared there is no conflict of interest.

Funding: None

Acknowledgments:

1. Dr. G. Anand Sekar, Associate Professor, Department of Cardiology, Aarupadai Veedu Medical College & Hospital, Vinayaka Mission's Puducherry Campus, VMRF - DU,

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Acta Biomed 2026; Vol. 97, N. 1: ISSN: 0392-4203 | eISSN: 2531-6745

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TABLE:

Table 1: Demographic Parameters

Parameters	Value
Age	55±10

Table 2: Chi-Square Test of Access Site and Complications – Non-complications

	VALUE	DF	ASYMPTOTIC SIGNIFICANCE
PEARSON CHI-SQUARE	5.648	2	0.059
LIKELIHOOD RATIO	5.28	2	0.071
NO OF VALID CASES	33		