Objective: To describe the clinical characteristics and associated complications in patients submitted to cardiac catheterization for femoral route. Method: Descriptive study with a quantitative approach performed with 99 patients submitted to cardiac catheterization for femoral route in a reference hospital for heart disease. Statistical Package for Social Sciences (SPSS), version 15.0 was used for data storage, processing and statistical analysis. Results: Among the participants of this research, 60.6% were men; 64.6% were elderly; 73.7% had coronary heart disease; 83.8% were hypertensive; 77.8% used antiplatelet drugs. It was found that 62.6% had been hospitalized for more than a week in the hospital and the main complication was vascular, being associated with use of antiplatelet drugs ($p = 0.035$). Conclusion: The occurrence of typical risk factors for heart disease and vascular complications suggests the need for a closer look by the nurse to the pre and post cardia catheterization in order to optimize the quality of care provided. Descriptors: Cardiac Catheterization/Complications; Femoral Artery; Nursing Care.

RESUMEN
Objetivo: describir las características clínicas y las complicaciones asociadas en pacientes sometidos al cateterismo cardíaco por vía femoral. Método: estudio descriptivo, de abordaje cuantitativo, realizado con 99 pacientes sometidos al cateterismo cardíaco, por vía femoral, en hospital de referencia para enfermedades cardíacas. Para almacenamiento, procesamiento y análisis estadístico de los datos, se utilizó el Programa Statistical Package for Social Sciences (SPSS), versión 15.0. Resultados: entre los participantes de esta investigación, 60.6% eran hombres; 64.6%, idosos; 73.7%, coronariopatas; 83.8%, hipertensos; 77.8% usaban antiplaquetarios. Se constató que 62.6% estaban internados por más de una semana en el hospital y la principal complicación fue la vascular, estando asociada al uso de antiplaquetario ($p = 0.035$). Conclusión: la ocurrencia de factores de riesgo típicos para enfermedades cardíacas y de complicaciones vasculares sugiere la necesidad de un olhar más atento del enfermero en el pre y pós-cateterismo cardíaco, para otimizar la calidad de la asistencia prestada. Descriptores: Cateterismo Cardíaco/Complicaciones; Artéria Femoral; Cuidados de Enfermagem.
Cardiovascular diseases (CVD) are one of the main causes of morbidity and mortality and are still a serious public health problem due to their high incidence. The patients of these diseases have become increasingly young, often with complications and early death.1 In Brazil, data from the Ministry of Health2 have shown that the risk factors for CVD have increased, representing for the Brazilian and world population a prolonged exposure to them and possible early development of such chronic health conditions.

In the process of cardiac disease, we highlight the Coronary Artery Disease (CAD) or coronary atherosclerosis, characterized by the narrowing of the coronary arteries resulting from changes in the vascular endothelium caused by the accumulation of atheromatous plaques.3-4 It is a condition of wide incidence, appearing first among the causes of death in Brazil, reaching in its majority a population in the full reproductive phase, in which its effects are translated into episodes of anginal pain, when the carrier of the disease is exposed to precipitating factors.5

In general, the therapeutic approach to the clinical manifestations of coronary artery disease consists of adopting general measures such as pain control, anxiety, rest, oxygen therapy, drug intervention and pharmacological and/or mechanical reperfusion. In this context, cardiac catheterization or coronary angiography, is an invasive examination that can be performed in an elective manner, in order to confirm the presence of obstructions of the coronary arteries or to evaluate the function of the valves and the heart muscle.6

The radial approach is usually the preferred option for patients undergoing cardiac catheterization because of the greater comfort it provides compared to the procedure performed for femoral route. However, femoral access is still the route of choice for the operator, as it provides faster procedures, allowing repeated interventions and the use of a greater variability of materials, and requiring less training compared to the radial access.7

Like any other invasive procedure, there are risks inherent in the technique that can be classified as transient or mild and severe events. Such complications represent expressible limits of the technique with the possibility of occurrence during or after the end of the procedure. However, the most common complications are related to the access point to perform the technique.8

Faced with the risks and complications resulting from this technique, such as pain, bruising, bleeding, redness and risk of infection, constant surveillance by the nursing team is necessary to avoid or minimize the occurrence of these complications, requiring specific interventions that result in an individualized service and with precise diagnoses.

Knowing the clinical characteristics with predictive factors of complications inherent to femoral cardiac catheterization is relevant to the extent that the results can guide health professionals in the management of pre and post cardiac catheterization care, with the appreciation of a more attentive look at the catheterized limb and its consequent recovery. In this meantime, the aim of this study is:

♦ To describe the clinical characteristics and associated complications in patients submitted to cardiac catheterization for femoral route.

METHOD

This is a descriptive quantitative study carried out in a tertiary health service that is a reference for cardiovascular diseases, agreed to the Brazilian Health System (SUS), and managed by the Health Department of the State of Ceará (SESA), located in the city of Fortaleza, Ceará.

The hospital has a 24-hour hemodynamic service, receiving patients for elective and emergency procedures from the capital and other municipalities. The hospital was chosen because it is a locus capable of offering data sufficiently important to reach the research objectives and for being an innovative field of cardiovascular nursing practices.

Cardiologic hospitalization units, whose patients had undergone elective cardiac catheterization, were chosen. Data collection was developed in the units that accommodate patients with different heart conditions and different indications of treatment. The inclusion criteria were: 1) being over 18 years of age; 2) having elective indication of catheterization. Exclusion criteria were: 1) being admitted to intensive care or emergency units; 2) being unconscious or unable to communicate with the interviewer.

The initial sample took into account the previous survey of catheterizations performed in the Hemodynamics sector in the months of October, November 2012 to January 2013, whose average showed to be 130 elective
cardiac catheterizations. However, the final sample consisted of 99 patients, according to the application of the pre-established criteria.

The previous selection of the patients was guided by the schedule of appointment prepared by the Hemodynamics sector. Once the procedure was scheduled, the researcher previously approached the patient requesting their participation in the study, after a thorough explanation about the study. After accepting and signing the Informed Consent Form, the patient was informed that they would receive a visit from the researcher after the procedure.

Data collection took place in three moments, namely: the first occurred after the patient returned to his or her original hospitalization unit, after the cardiac catheterization was completed; the second, within 24 hours after the procedure; and the third, within 48 hours. At the time of each visit, the researcher used a form containing information about the clinical characteristics of the patient as a tool to record the data.

For each patient selected as participant of the study, three forms were elaborated separately for each visit. When there was need to complement information at this stage of data collection, the patients’ charts were used, according to the authorization of a term previously made available by the service.

Regarding the clinical characteristics, many risk factors for CVD were observed (Figure 2). In the studied sample, the majority had some type of coronary disease (73.7%) and had previous SAH (83.8%). Just over a third had previous diabetes melittus (DM) (37.4%) and almost a quarter of the patients had dyslipidemia as a risk factor (19.2%). About 77.8% of the participants used antplatelet drugs and 36.4% used anticoagulant drugs. Regarding the presence of palpable pulses, almost all presented popliteal pulses (94.9%) and pedal pulses (98.0%) prior to the initiation of cardiac catheterization.

Statistical Package for Social Sciences (SPSS), version 15.0 was used for data storage, processing and statistical analysis. The categorical variables were summarized by descriptive statistics of absolute and relative frequencies, as well as the means and standard deviation of the continuous variables. Pearson’s chi-square test or Fisher’s exact test was used to identify the variables related to the types of complication, and the value of p <0.05 was considered statistically significant.

The data were analyzed statistically, based on the variables of interest for the study, and organized in tables and graphs, and their discussion was carried out through the use of pertinent literature.

The project was approved by the Research Ethics Committee of that institution, and was approved in accordance with opinion No. 243.219/13, in accordance with Resolution 466/12 of the National Health Council.
Regarding the length of hospital stay of the study participants, it is clear that chronicity affects the majority of the patients and that it generates longer time of hospitalization. Thus, it was noticed that most of them had been hospitalized for more than one week (62.6%) in the hospital where the catheterization was performed and the other patients (36.4%), for a shorter period.

In the analysis of the care performed after the procedure (Table 1), the following aspects were verified: characteristics of the dressing, length of stay of the introducer and the person responsible for its removal, as well as the place of withdrawal. In addition, rest time in the bed was also identified.

With reference to the data presented in Table 1, all the dressings performed were occlusive, demonstrating that nursing care was performed in a manner consistent with what is recommended in the literature regarding the type of dressing and other interventions for this type of procedure. It was also possible to observe that most of the introducers remained in the femoral route for less than or equal to 30 minutes (54.5%) and that the nurse was responsible for the withdrawal of almost all the introducers (86.9%), more specifically the professional in the hemodynamics sector (81.8%).

At the end of the procedure, the patients were evaluated by the researchers, who found a significant percentage of complications (36.6%) (Figure 3). After being identified, the complications were classified according to Figure 4.
Figure 3. Presence and type of complication in patients submitted to cardiac catheterization for femoral route. Fortaleza (CE), Brazil, 2013.

Figure 4. Presence and type of complication in patients submitted to cardiac catheterization for femoral route. Fortaleza (CE), Brazil, 2013.

The survey showed that the vascular complication was the most frequent complication, affecting 47.2% of the participants with complications. When Fisher’s Exact test was used, a statistically significant association was observed between “type of complication” and “antiplatelet use” ($p = 0.035$), in which a greater proportion of vascular complications were found in the group of patients using antiplatelet agents (50%). For the other variables, no significant statistical association was found.

The sociodemographic or clinical characteristics of patients undergoing cardiac catheterization should be investigated whenever possible in order to establish better conducts. Considering the findings of this study, the information referring to the sociodemographic characteristics of this clientele was in line with existing publications. It is known that CVD affects men and elderly patients more frequently, and they may undergo cardiac catheterization more frequently because of their chronic health condition.

Several risk factors for CVD were identified in this study, revealing how deleterious the lifestyle of the participants has been, so that the overlapping of these various factors may have culminated in the catheterization. Due to the impossibility of identifying with certainty who will develop an ischemic syndrome deriving from an atherosclerotic lesion, there are some situations that are directly related to the progression and complications of the atherosclerotic lesion and are equally important in both sexes, despite the importance being relatively larger for a given group.

It is important to emphasize that the development of actions to prevent and treat modifiable risk factors such as smoking, obesity, sedentary lifestyle, dyslipidemia, hypertension and DM (type II), among others, have been the objective of different health programs throughout Brazil. However, some of them are still predominant in the patients participating in this study.

The hospitalization time of patients undergoing catheterization also tells us a lot about the chronic health condition found in the patients in this study. Spending more than one week hospitalized reveals possible invasive interventions, often of a surgical nature. The high cost resulting from specialized exams is notably perceived in the diagnosis and treatment of CVD. In a national information system, it was possible to verify that the value paid by SUS for each cardiac catheterization was the most frequent complication, affecting 47.2% of the participants with complications. When Fisher’s Exact test was used, a statistically significant association was observed between “type of complication” and “antiplatelet use” ($p = 0.035$), in which a greater proportion of vascular complications were found in the group of patients using antiplatelet agents (50%). For the other variables, no significant statistical association was found.

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Catheterization performed is around R$ 614.00, and it can reach R$ 1,575.00 in those procedures that include angioplasty or even stent placement.  

Despite such data, other factors interfere in the choice of the type of route of the cardiac catheterization. The choice of the vascular access site in most centers is more a matter of tradition, opinion and experience of the operator than an evidence-based decision. Differences in the patient profile should also be taken into account. Women have, in general, thinner arteries and with a greater chance of spasm, a fact that hinders the procedure in the initial phase of the use of femoral access.  

It is verified that although the femoral route is the most used, it results in a greater number of complications in the patients who are submitted to it, being the radial route the preferential in the group of high risk patients. Authors corroborate that cardiac catheterization by the radial route offers greater comfort for the patient, since it allows immediate ambulation; Reduction of nursing care with the access route; and early hospital discharge, with reduced costs.  

A recent study examined the self-reported discomforts of 228 patients after cardiac catheterization for femoral route. The authors found that the most common discomforts were low back pain, pain at the puncture site and malaise. Regarding the occurrence of complications from the technique, studies show that most common ones include hematoma, pseudo-anerysm, arteriovenous fistula, hemorrhages related or not to the puncture site, branch lesion, vessel occlusion and infections.  

Although the number of complications found in this study is higher than that reported in other studies, they are similar, and the most frequent are vascular, vasovagal, ischemic and allergic complications. Pseudo-anerysm has not been identified in the current study.  

It was found association between the presence of vascular complications and the use of antiplatelet agents (p = 0.035). However, other aspects should be studied later, such as the type of route of catheterization and the care performed before and after the procedure, since they may influence the appearance of complications.  

Although the femoral route provides greater complications regardless of the care provided, the nursing team can minimize them by making a prior assessment of the

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bed of patients, which last for around 6 hours. There was a considerable frequency of complications, among which the vascular complication was the most frequent and was associated with antiplatelet use.

In this sense, nursing professionals need to be attentive to the planning of care for the patient who will undergo or who had undergone the procedure discussed here, with attention to the interruption of antiplatelet use before the procedure, considering the systematization of nursing care, which should be performed through critical and clinical reasoning, based on scientific knowledge.

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