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Original Article

RISK FACTORS FOR FALLS IN HOSPITALIZED PATIENTS WITH ISCHEMIC CARDIOPATHY

*FATORES DE RISCO PARA QUEDAS EM PACIENTES HOSPITALIZADOS COM CARDIOPATIA ISQUÊMICA**

FACTORES DE RIESGO PARA CAÍDAS EN PACIENTES HOSPITALIZADOS CON CARDIOPATÍA ISQUÉMICA

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This study aimed to identify the presence of the Nursing Diagnosis Risk for Falls in hospitalized patients with ischemic heart disease in Fortaleza, Ceará, Brazil. This was a descriptive and quantitative study. Data collection happened from July 2010 to February 2011, through interviews, physical examination and by consulting medical records. We used an instrument to investigate the clinical and socio-demographic profile of the patients and also a check-list consisting of the Nursing Diagnosis risk factors. Of the 86 participants, 56.5% were male, mean age of 63.95 (±12.6) years. All the participants had more than two risk factors for falls, 46.5% presented six to nine concurrent risk factors. Among the investigated risk factors we identified: use of antihypertensive drugs (98.8%), visual impairment (66.3%), and sleeplessness (54.3%). Therefore, it is important for nurses to plan the care in order to prevent falls, especially for hospitalized patients with ischemic heart disease.
Descriptors: Accidental falls; Risk Factors; Cardiovascular Diseases; Nursing; Nursing Diagnosis.

A proposta do estudo foi identificar a presença do diagnóstico de enfermagem Risco de quedas em portadores de cardiopatia isquêmica hospitalizados em Fortaleza, Ceará. Estudo descritivo e quantitativo. Dados coletados de julho/2010 a fevereiro/2011, mediante entrevista, exame físico e consulta ao prontuário. Utilizou-se instrumento para investigar perfil sociodemográfico e clínico do paciente e *check-list* composto pelos fatores de risco do Diagnóstico de enfermagem. Dos 86 investigados, 56,5% eram do sexo masculino, com média de 63,95 (±12,6) anos de idade. Todos os participantes possuíam mais de dois fatores de risco para quedas, sendo que 46,5% apresentavam de seis a nove fatores simultâneos. Dentre os fatores de risco investigados destacaram-se: uso de medicamentos anti-hipertensivos (98,8%), dificuldade visual (66,3%) e falta de sono (54,3%). Nesse contexto, cabe aos enfermeiros planejarem cuidados visando à prevenção de quedas, especialmente para portadores de cardiopatia isquêmica, em ambiente hospitalar.
Descritores: Acidentes por quedas; Fatores de Risco; Doenças Cardiovasculares; Enfermagem; Diagnóstico de Enfermagem.

El propósito del estudio fue identificar la presencia de diagnósticos de enfermería Riesgo de Caídas en personas con cardiopatía isquémica en hospital de Fortaleza, Ceará, Brasil. Estudio descriptivo y cuantitativo, cuyos datos fueron recogidos de julio/2010 a febrero/2011, a través de entrevistas, examen físico y consulta con registros médicos. Fueron investigados el perfil sociodemográfico y clínico del paciente y *check-list* con factores de riesgo del diagnóstico de enfermería. De los 86 investigados, 56,5% eran del sexo masculino, con media de 63,95(± 12,6) años de edad. Los participantes poseían más de dos factores de riesgo para caídas, 46,5% presentaban entre seis y nueve factores concurrentes. Entre los factores de riesgo, se destacaron: uso de antihipertensivos (98,8%), dificultad visual (66,3%) e insomnio (54,3%). En este contexto, enfermeros deben planear la atención para prevención de caídas, especialmente en pacientes con cardiopatía isquémica en entorno hospitalario.
Descriptores: Las caídas accidentales; Factores de riesgo; Las enfermedades cardiovasculares; Enfermería; Diagnóstico de Enfermería.

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INTRODUCTION

Falls are a major public health problem because they cause high morbidity and mortality[1]. They also cause damage to quality of life, as they demand special care after their occurrence, with serious physical, economic and social consequences for individuals and their families[2].

Statistics indicate that 30% to 60% of the population over 65 years of age falls annually and half of this portion has more than one fall per year, causing some type of injury of bigger or smaller severity[3]. Although many studies investigate the risk of falls in the elderly, few are designed to study the risk in specific populations characterized by having medical conditions that increase the chances for the occurrence of falls. This fact justifies the conduction of this study.

Falls occur due to loss of postural balance and they may be caused by primary problems of the musculoskeletal and/or neurological system or by a medical condition that affects secondarily the mechanisms that promote stability. Thus, it is an event that shows impaired functional capacity and it may represent a symptom of disease[3].

Intrinsic factors related to the individual and linked especially to physiological changes may influence its occurrence; and extrinsic factors related to environmental and behavioral risks, such as excessive and improper positioning of furniture, uneven ground and climbing stairs without safety devices[2].

There is a relationship, even indirectly, between some cardiovascular disorders and an increased likelihood of falls. Examples include structural heart disease such as aortic stenosis, and ischemic heart diseases, such as acute myocardial infarction[4]. These can lead to reduced blood flow in the brain, which causes imbalance in the supply of oxygen. The main symptoms are dizziness, vertigo and muscular weakness, considered factors that predispose them to falls[5].

When examining a group of patients who have fallen in the past three years, research has identified that 64% had an illness before the fall, and heart disease was the most common[6]. Another study[7] indicated that among the diseases shown by individuals who have fallen, heart diseases were the most prevalent, totaling 34.9%. Despite these results, another study[8] did not find a significant relationship between falls and cardiovascular diseases.

Even without support from the literature, the presence of cardiovascular disorders in the elderly is common and it leads to higher rates of hospitalization. These two factors alone are causing falls. In people over 65 years of age there is a variety of indicators characteristic of aging that increases the chances of falls; among these include: gait abnormalities, cognitive decline and visual difficulties[9].

When patients are hospitalized, they are more likely to fall due to their own health condition that has weakened by the disease, impairing the functional capacity, and unfamiliarity with the hospital environment. The wards may pose risks to patients due to lack of favorable conditions, because many do not have devices that provide adequate support during locomotion, efficient lighting or regular floor surfaces[10].

Thus, falls are a significant problem for individuals admitted to hospitals and to nursing, because their occurrence may aggravate the patient's condition, causing uncertainty regarding the ability to perform activities autonomously[11]. For nursing, prevention of falls is an indicator of quality in the hospital care and should be included in planning and implementation of assistance.

In this context, the identification of nursing diagnosis (ND) Risk of falls, a component of the NANDA taxonomy - International (NANDA-I)[12], is an effective strategy to address the prevention and promotion of the patient's health, as well as to allow the systematization of nursing care.

That ND is defined as an increased susceptibility to the occurrence of falls that can cause physical damage. The risk factors described in this context are divided into categories that include intrinsic and extrinsic conditions such as physiological changes, presence of diseases, environmental factors and medication[12].

In face of this, one notices that some hospitalized patients suffering from ischemic heart disease should be evaluated on the presence of concomitant risk for falls, besides cardiovascular diseases. A subsequent episode of the event during hospitalization may worsen their health condition, hampering the recovery of the individual.

Thus, one aimed to evaluate the risk of falls in patients hospitalized for ischemic heart disease in a reference hospital in the city of Fortaleza/CE.

METHODS

It is descriptive and cross-sectional study, conducted in a hospital for specialized care of heart diseases, linked to public health system in Fortaleza/CE, Brazil. The study included patients with a medical diagnosis of any type of ischemic heart disease, who were receiving medical or surgical treatment in the hospital mentioned. Regarding the inclusion of participants in the survey, one used the following criteria: over 18 years old, have medical diagnosis of ischemic heart disease, be treated in any of the clinical units designated for the study. One excluded patients who had concomitant problem of structural heart disease, and those who did not have preserved mental state to respond to a form. The mental state was considered abnormal when the participant had slurred speech with significant losses of memory that prevented the response of the items, however, no participant was excluded by this criterion. The sample included 86 patients.

The data were collected from July 2010 to February 2011, by primary source through interviews, physical examination and research in the medical record. For the interview one used an instrument to collect demographic and clinical data, along with other information such as history of falls and medication use. Data from medical records were consulted to confirm some information, such as medical diagnosis, other medical conditions and type of drugs used, in addition to obtaining anthropometric measurements, weight and height values.

Risk factors for the ND Risk of falls composed a checklist applied by the researchers. Out of the 55 risk factors described in the taxonomy of NANDA-I[12] related to the nursing diagnosis Risk of falls, one investigated those classified as: exclusive for adults (6 risk factors), physiological (23 risk factors), and related to medication (9 risk factors), totaling 38 risk factors.

One did not investigate in this study the environmental, cognitive and unique to children risk factors. After collecting data, we realized that participants provided several responses concerning the items category of environmental hazards present in NANDA-I, namely: environment with furniture and objects in excess, absence of anti-slip material on the bathroom floor, absence of anti-slip material on the floor of the bathroom stall, poor lighting, not familiar room. Some referred to the home environment, while others responded in accordance with the hospital conditions experienced at the time of collection. As we did not standardize this question on the questionnaire and this limitation was only seen in the phase of data analysis we decided to exclude this category of the final outcome.

The cognitive risk factor was not investigated because it was established for inclusion in the study that

the individual should have preserved mental state. As well as the physiological factor change in the sugar rates since it would require more than one evaluation. Risk factors unique to children, did not apply to the population of interest.

The presence of risk factors was determined according to the participants' perception after the researchers' question who explained in accessible language each item. Physical examination consisted of a test of strength in the lower limbs. To evaluate the strength in the lower limbs participants were sitting or lying, the examiner applied a force in the plantar region leading to the dorsiflexion of the toes, prompting the participant to resist to the force. The perception of the resistance was classified as absent or present.

Data were compiled in Excel 2007 tables and statistical analysis was carried out according to the principles of descriptive statistics, obtaining frequencies, averages, standard deviations and confidence intervals, besides the application of the Kolmogorov-Smirnov test to check the normality of the findings. We considered a level of significance of 95%. Statistical analysis was performed using the *Statistical Package for the Social Sciences* (SPSS) version 18.0 for Windows®.

The study was consistent with the recommendations of Resolution 196/96 of the National Health Council, regarding research involving human subjects, evaluated and approved by the Ethics in Research Committee (ERC) of the institution where it was developed, under protocol # 635/09. Patients who agreed to participate signed a consent form.

RESULTS

Among the patients studied, 53.5% were male, with an average of 63.9 (± 12.5) years of age and 4.8 (± 4.2) years of education, and these data follow a symmetric distribution ($p > 0.05$). Most of the participants (75.6%) had a stable relationship. Table 1 shows the demographic and clinical data of the participants.

Table 1 – Sociodemographic and clinical data of the participants. Fortaleza, CE, Brazil, 2011

Variables	N	%	IC[1] (95%)
Gender			
Male	46	53,5	42,4 - 64,3
Female	40	46,5	35,7 - 57,6
Marital status			
Stable union	65	75,6	65,1 - 84,2
Widower	9	10,5	4,9 - 18,9
Single	7	8,1	3,3 - 16,1
Divorced	5	5,8	1,9 - 13,0
Origin			
Fortaleza	46	53,5	42,4 - 64,3
Coutryside of Ceará	36	41,9	31,3 - 53,0
Another state	4	4,7	1,3 - 11,5
Main symptom (on admission)			
Chest pain	56	65,9	54,8 - 75,8
Shortness of breath	15	17,6	10,2 - 27,4
Arrhythmia	2	2,4	0,3 - 8,2
Pain in stomach	2	2,4	0,3 - 8,2
Other	11	13,2	4,2 - 17,7
Comorbidities			
Hypertension	76	88,4	79,7 - 94,3
Diabetes Mellitus	40	46,5	35,7 - 57,6
Dyslipidemia	38	44,2	33,5 - 55,3

	Média	DP[2]	Mediana	P25[3]	P75[4]	Valorp[5]
Age (years)	63,95	12,66	66,00	57,00	73,00	0,527
Schooling (years)	4,86	4,2	4,00	0,00	8,00	0,017

[1] IC – Intervalo de Confiança [2]DP – Desvio-Padrão. [3]P25 - Percentil 25. [4]P75- Percentil 75. [5] Teste de Kolmogorov-Smirnov.

The admission of the majority (65.9%) was motivated by chest pain or shortness of breath (17.6%), considered the most important and reported symptoms. The most identified medical diagnosis at the time of hospitalization was acute myocardial infarction (52.3%), and coronary disorders (37.2%), namely, coronary insufficiency, coronary artery disease and coronary syndrome.

Regarding the presence of comorbidities, 88.4% had hypertension (HT), 46.5% had diabetes mellitus (DM), and 40.7% had both diseases simultaneously. All participants had the ND Risk of falling, as at least two risk factors were identified in each one of them. Patients had, on average, 8.38 concomitant risk factors (SD = 3.34). The following are the most prevalent risk factors according to the categories investigated (exclusive for adults, physiological and pharmacological). Table 2 related risk factors unique to adults.

Table 2 - Distribution of participants according to the presence of risk factors unique to adults. Fortaleza, CE, Brasil, 2011

Risk Factors	N	%	IC[1] (95%)
Age> 65 years old	39	45,3	32,4 - 54,2
History of falls	34	39,5	29,5 - 50,7
Living alone	9	10,5	4,9 - 18,9
Auxiliary device	6	7,0	2,6 - 14,6
Other	2	2,4	0,0 - 6,3

[1] CI – Confidence Interval

According to the data shown in Table 2, age over 65 years old (45.3%) and history of falls (39.5%) were the most prevalent risk factors unique to adults among the study participants. Among the risk factors included

in "Other" are: lower limb prosthesis and use of a wheelchair, found in 1.2% of those investigated.

Table 3 - Distribuição dos participantes segundo a presença de fatores de risco fisiológicos. Fortaleza, CE, Brasil, 2011

Risk Factors	N	%	IC[1] (95%)
Visual difficulty	57	67,1	56,0 - 76,9
Lack of sleep	45	52,3	41,3 - 63,2
Difficulty in walking	36	42,4	31,7 - 53,6
Vascular disease	33	38,8	28,4 - 50,0
Difficulty in hearing	25	29,1	19,8 - 39,9
Foot problems	22	25,6	16,8 - 36,1
Impaired physical mobility	20	23,5	15,0 - 34,0
Decreased strength in the lower limbs	18	20,9	12,9 - 31,0
Impaired balance	18	20,9	12,9 - 31,0
Arthritis	17	19,8	12,0 - 29,8
Proprioceptive deficits	14	16,3	9,2 - 25,8
Neuropathy	14	16,3	9,2 - 25,8
Diarrhoea	12	13,9	7,4 - 23,1
Vertigo when turning the neck	11	12,8	6,6 - 21,7
Vertigo by extending the neck	10	11,6	5,7 - 20,3
Orthostatic hypotension	10	11,6	5,7 - 20,3
Other	11	12,8	6,6 - 21,7

[1] CI – Confidence Interval

Table 3 shows the list of physiological risk factors grouping 23 items, and the detailed category of the ND investigated. One identified 19 risk factors in it, among which stood out: visual impairment (66.3%), sleeplessness (52.3%), difficulty in walking (41.9%), vascular disease (38.4%), hearing impairment (25.6%) and foot problems (25.6%).

Among those classified as "Other" are the factors anemia, incontinence and neoplasm, presented with lower prevalence, 7%, 3.5% and 2.3%, respectively. There were no risk factors for acute disease and urgency. The factor "downgraded mental status" was not considered because it is an exclusion criterion for participation in the research.

Table 4 - Distribution of participants according to the presence of drug risk factors. Fortaleza, CE, Brasil, 2011

Risk Factors	N	%	IC[1] (95%)
Antihypertensive	85	98,8	93,7 - 100,0
ACE inhibitors	62	72,1	61,4 - 81,2
Diuretics	33	38,4	28,1 - 49,5
Alcohol use	21	24,7	16,0 - 35,3
Anxiolytic Agents	15	17,4	10,1 - 27,1
Narcotics	13	15,1	8,3 - 24,5
Other	8	9,3	3,6 - 16,8

[1] CI – Confidence Interval

Regarding the medication risk factors, one found that nearly all individuals used drugs in the class of antihypertensive drugs (98.8%), which points to the close relationship between elevated blood pressure and cardiovascular diseases of ischemic nature.

Over 50% of participants used medications in the class of Angiotensin-converting-enzyme inhibitor (ACE), fact that can be explained by concomitant chronic diseases such as hypertension and diabetes, and in those cases, the drugs belonging to this class are the most indicated. Regarding diuretics, they were used by 41.9% of patients. Among this class were identified loop diuretics, and potassium-sparing as those commonly used by the participants. Smaller percentages were observed in the use of tranquillizers and hypnotics classified as "Other", with 3.5% and 5.8%, respectively. No participant was taking tricyclic antidepressants.

DISCUSSION

Among patients enrolled in the study, stood out those over 65 years old (45.3%), confirming an increased incidence of ischemic heart disease in this age group. Many patients with ischemic heart disease belong to this age group and have changes in the functioning of the body, characteristics of aging together with cardiac symptoms[13]. There is a need for adequate assistance focused on meeting the specificities of this population, highlighting all related factors characteristic of these patients, which are related to their willingness and ability to perform daily activities safely and satisfactorily.

Researches shows that, among young people, diseases of the circulatory system are responsible for 11.5% of hospital admissions, whereas in the elderly population this reason for hospitalization covers from 28 to 30% of the total[14]. Another important aspect is the average time in the hospital. In the public sector, the average length of hospitalization for ischemic heart disease is 12.6 days, reaching an average of 29 days or more in 2% of the patients[15].

A longer hospital stay is a predisposing factor to increase the risk of falls, because the longer the patients remains hospitalized, the greater the changes in their lifestyle, causing physical and organic changes that interfere with their ability to perform movements safely[16].

In the present study, men were more prevalent (53.5%). Although slight, this prevalence corroborates the literature. The increased incidence of these diseases in men was attributed to the increased presence of unhealthy habits, when compared to the amount identified in females. Among these habits are smoking, alcohol abuse, consumption of meat with excess of fats and sedentary lifestyle, which influence the onset of acute and chronic heart diseases[17].

These habits may also explain the higher percentage of cases of hypertension and diabetes among males, found in this study. The HT is a chronic disease that affects the elderly and their progression is proportional to increasing age, causing cardiovascular injuries that impair significantly the individual's functional capacity, thus contributing to the risk of falls [9]. In this study 88.6% of subjects reported having a diagnosis of hypertension.

Another chronic disease that may influence the onset of cardiovascular diseases is diabetes mellitus, which has a prevalence of 17.83% among the elderly in Brazil, accounting for serious consequences for the individuals affected. It is also aggravating the existence of dyslipidemia, present in 44.8% of participants.

These diseases alone do not show significant association with the risk of falls in this study, but the effects observed in their carriers are determinant for the risk of falls. We can mention among these consequences: stroke, responsible for motor and sensory impairment and peripheral neuropathy with decreased sensory perception and balance.

The coexistence of two or more risk factors for cardiovascular disease was present in 40.7% of the investigated people. A combination of factors such as hypertension, diabetes, physical inactivity, obesity with high blood cholesterol level increases the risk of ischemic heart diseases[18].

Chronic diseases such as cardiovascular and metabolic ones are considered predictors for the occurrence of falls, as chronicity develops damage in many organic systems, especially the circulatory, resulting often in ischemic events. They bring future consequences that will interfere in the performance of usual activities satisfactorily, leading to increased risk of falls[11].

Falls occur due to the combination of intrinsic and extrinsic factors, which may be behavioral or environmental. Although environmental risk factors were not investigated, components of the ND Risk of falls, all respondents had at least the risk factor staying in unfamiliar room. Thus, the combination of more than one risk factor characterizes the presence of ND. This fact shows the greatest risk of falling that afflicts hospitalized individuals, especially with diseases of the circulatory system.

As discussed previously, the use of drugs is one of the most significant risk factors for falls. In a research about the occurrence of falls associated with polypharmacy, one found that benzodiazepines, neuroleptics, sedatives, hypnotics, antidepressants, diuretics in general, antiarrhythmics, antihypertensives, vasodilators and digoxin were related to a higher risk of falls, particularly in population over 60 years. Furthermore, one found that a greater amount of medicines is associated with more frequent episodes of falls, when compared to the lowest consumption of medications[11].

It is important that the patient knows the type of medicine used and its consequences. In the present study, although 98.8% of individuals use antihypertensive drugs, only 88.4% were identified as having hypertension, these data indicate the use of this class of drugs with other therapeutic purposes. However, since this condition increases the risk of falls, the patient should be aware of it to prevent injuries.

The occurrence of one or more episodes of falls in the previous year results in increased risk of more falls to happen in the following year[3]. In institutionalized elderly with a history of falls, or even in individuals who have fallen or not, there is a report of fear of falling. Thus, patients who have undergone events of fall develop this feeling in a traumatic way, causing the person to prevent themselves from performing activities, resulting in loss of fitness-functional performance and contributing to subsequent falls[1].

As a result, one found that a significant portion of the participants experienced one or more falls in the past six months. One noticed that many individuals with signs of ischemic heart disease remain hospitalized for long periods, an average of two weeks[16]. The sum of these factors, history of previous falls and hospitalization time, can result in higher chances of falling.

Visual changes such as cataracts, glaucoma and muscle degeneration, common in aging, have strong relationship with the greatest risk of falling. One verified that, in this study, almost half of the individuals belonged to the age group above 65 years old, and that many others had other chronic health changes together with a heart disease, impairing the functioning of various organs, among them, the eyes[3]. This can justify the amount of participants with vision changes (66.3%), considered one of the main physiological risk factors that increase the risk of falls.

It was observed during the study that hospitalized patients did not rest adequately during the night, indicating as causes: sleeplessness due to several factors, anxiety due to the disease, lack of familiarity with the hospital environment, side effect of some medications, including others. A study conducted with institutionalized elderly patients identified that the nursing diagnosis Disturbed sleep pattern was one of the most frequent among them, with percentage of 15.5%[19].

Orthostatic hypotension was identified in few patients, contradicting another study with similar population, in which one argues that it is common the evidence of this risk factor in this population[9]. This difference can be attributed to the age of the participants, or the type of drugs used. It was not possible to find associations with the data investigated.

It should be noted that all participants were taking two or more types of drugs, being susceptible, therefore, to the consequences of polypharmacy already mentioned. The amount of medication used influences the frequency of fall episodes among individuals.

It was proven in a similar study that those who used five or more drugs possessed significantly higher frequency of falls, having five falls in the previous year and five falls in the subsequent year, compared to those who used a smaller amount of drugs, ranging between three and four falls in the previous year and the following year[11].

The use of medication in large quantities should be supervised by health professionals in order to identify adverse effects that may favor the occurrence of falls, which are one of the main causes for worsening in health conditions, resulting in prolongation of hospitalization.

By identifying potential risk factors and determining the presence of the ND Risk of falls, nurses have guidelines for the development of actions to prevent these episodes, providing greater comfort and safety for patients in hospitals, contributing to the reduction of injuries and the maintenance of quality in hospital care[20].

CONCLUSIONS

The ND was identified in all study participants, once everyone had at least two risk factors for falls. Among these, the ones that stood out were: use of antihypertensive drugs (98.8%), use of ACE inhibitors (81.4%), visual impairment (66.3%), sleeplessness (54.3 %), age over 65 years old (45.3%) and history of falls (38.4%).

Given the large number of risk factors for falls identified in patients with ischemic heart disease during hospitalization, one sees the need for a greater commitment on the part of health professionals to identify risks, their origin and propose preventive actions aimed at the well-being of the patient and a faster rehabilitation, besides minimizing potential health problems caused by falls.

As health professionals, it is the responsibility of nurses to take preventive actions regarding the risk of falls, for having a holistic view and having an instrument that assists in providing a systematic assistance, enabling the approach of various dimensions in terms of the individual, represented by the nursing process. This allows us to identify the earliest possible elements that can act jointly with the disease, impairing the functional capacity of patients and direct the selection of appropriate interventions to minimize the occurrence of injuries.

The study was limited by investigating a group with specific characteristics and the characteristics of the data collection, consecutive for convenience. One realizes the need for additional studies to be conducted with less specific groups and in other hospitals.

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