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CLINICAL PROFILE OF PATIENTS WITH CARDIOVASCULAR DISEASES CARED FOR AT THE EMERGENCY DEPARTMENT OF A TEACHING HOSPITAL

PERFIL CLÍNICO DOS PACIENTES COM DOENÇAS CARDIOVASCULARES ATENDIDOS NA EMERGÊNCIA DE UM HOSPITAL DE ENSINO

PERFIL CLÍNICO DE PACIENTES CON ENFERMEDADES CARDIOVASCULARES ATENDIDOS EN EL DEPARTAMENTO DE EMERGENCIAS DE UN HOSPITAL DE ENSEÑANZA

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ABSTRACT

Objectives: to characterize patients cared for at an emergency department; to identify the major cardiovascular diseases treated; and to determine the respective patient outcomes. **Method:** descriptive and retrospective study conducted assessing electronic medical records, with a sample of 4,329 adult patients (>18 years of age) cared for from January 2009 to May 2010. Data analysis was carried out using statistical tests, namely: chi-square test, analysis of variance (ANOVA), Tukey's *post hoc* test, Kruskal-Wallis test, and Dunn's multiple comparison test. The research project was approved by the Research Ethics Committee, Opinion No. 165/2011. **Results:** most patients assessed were male (52.86%), with level of education of four to seven years of study (32.04%); they had a partner (57.73%) and were service sector workers (51.22%), followed by housewives (32.60%), whites (86.48%), with median age of 60 years. Cerebral vascular accident was the main admission diagnosis and the main patient outcome was hospital discharge. **Conclusion:** the older adult population is the most vulnerable to cardiovascular diseases in emergency services. **Descriptors:** Emergency; Cardiovascular Diseases; Epidemiology.

RESUMO

Objetivos: caracterizar os pacientes atendidos no pronto atendimento; identificar as principais doenças cardiovasculares atendidas e verificar o destino destes pacientes. **Método:** estudo descritivo, de corte retrospectivo, a partir de análise de prontuários eletrônicos, com uma amostra de 4.329 pacientes adultos (>18 anos de idade), atendidos no período de 01/2009 a 05/2010. A análise de dados foi realizada através de testes estatísticos como teste qui-quadrado, análise de variância (ANOVA), teste *post hoc* de Tukey e aplicação de teste de Kruskal-Wallis com posterior teste de comparação múltipla de Dunn. O projeto de pesquisa foi aprovado pelo Comitê de Ética em Pesquisa, Parecer nº 165/2011. **Resultados:** a maioria dos pacientes avaliados era do sexo masculino (52,86%), com grau de instrução de quatro a sete anos de estudo (32,04%), com companheiro (57,73%) e trabalhadores do setor de serviços (51,22%), seguidos de trabalhadoras do lar (32,60%), de etnia branca (86,48%), com idade mediana de 60 anos, tendo como diagnóstico principal da internação o acidente vascular cerebral e destino principal a alta após o atendimento. **Conclusão:** a população idosa é a mais vulnerável às doenças cardiovasculares no serviço de emergência. **Descritores:** Emergência; Doenças Cardiovasculares; Epidemiologia.

RESUMEN

Objetivos: caracterizar los pacientes tratados en el departamento de emergencias; identificar las principales enfermedades cardiovasculares atendidas; y determinar el destino de estos pacientes. **Método:** estudio descriptivo y retrospectivo con análisis de expedientes médicos electrónicos, con una muestra de 4.329 pacientes adultos (>18 años de edad) atendidos de enero de 2009 a mayo de 2010. El análisis de datos se realizó mediante pruebas estadísticas tales como prueba chi-cuadrado, análisis de varianza (ANOVA), prueba *post hoc* de Tukey, prueba de Kruskal-Wallis y prueba de comparación múltiple de Dunn. El proyecto de investigación fue aprobado por el Comité de Ética en Investigación, Dictamen N° 165/2011. **Resultados:** los pacientes estudiados eran en su mayoría hombres (52,86%), con nivel de educación de cuatro a siete años de estudio (3,04%), con compañero (57,73%) y eran trabajadores del sector de servicios (51,22%), seguidos de amas de casa (32,60%) de raza blanca (86,48%), con mediana de edad de 60 años. El accidente vascular cerebral fue el principal diagnóstico de hospitalización y el alta después del atendimento fue el principal destino de los psclantes. **Conclusión:** la población de adultos mayores es la más vulnerable a enfermedades cardiovasculares en el servicio de emergencia. **Descriptores:** Emergencia; Enfermedades cardiovasculares; Epidemiología.

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INTRODUCTION

In Brazil, about four million people seek urgency and emergency services due to thoracic pain. Data indicate prevalence similar to that of the United States, where about 5 to 10% of the care provided in emergency services is due to thoracic pain.¹ With respect to the costs of hospitalization in Brazil, cardiovascular diseases stand out, accounting for 20% of the total provided by the Unified Health System. These hospitalizations cause the main expenses among men and the second among women.²

The most common risk factors for cardiovascular diseases are: sedentary lifestyle; smoking; systemic arterial hypertension; obesity; diabetes mellitus; dyslipidemia; alcohol consumption—considered modifiable risk factors—and family history, which is a non-modifiable factor.²⁻⁵

Thoracic pain has many causes and it can be benign or potentially fatal. Mostly, thoracic pain does not affect patients' lives and is often related to musculoskeletal impairment. The assessment and interpretation of patients' clinical conditions is of great importance, since some diseases, such as acute coronary syndromes (ACS), pulmonary embolism, aortic dissection, pericarditis, pneumothorax, and esophageal perforation are potentially fatal.⁵

Even though numerous causes lead to thoracic pain, those originating from the cardiovascular system are the ones that cause greater concern due to the increased risk of mortality and need of hospitalization.⁶ The initial assessment of patients with thoracic pain should be based on two main questions: (a) What is the likelihood that the signs and symptoms are due to ACS caused by coronary atherosclerotic disease? (b) What is the likelihood of the development of cardiac events, such as myocardial infarction, cerebral vascular accident (CVA), heart failure, and recurrent symptoms of serious arrhythmias or ischemia?⁷

The use of protocols and the systematization of medical procedures—whether diagnostic or therapeutic—are of great importance to reduce the occurrence of coronary events, in addition to being a powerful and efficient tool for optimizing quality and cost-benefit ratio. According to studies, following the recommendations of the corporate guidelines to treat patients with ACS reduces mortality.⁸

The main symptoms of patients diagnosed with ACS are: precordial or retrosternal pain being at rest within the last 48 hours, or one or more of the following findings: unexplained

thoracic pain; dyspnea; and syncope. These symptoms can be associated or not with the elevation of myocardial injury markers (CK, CKMB mass, or cardiac troponin I), or recent ischemic changes in the electrocardiogram, such as non-ST-segment elevation, persistent ST-segment elevation, T-wave inversion equal to or greater than 0.5 mm, or bundle-branch block.⁹

It is important to stress that cardiovascular diseases remain the leading cause of preventable death worldwide. Public health efforts are necessary to improve lifestyles, controlling the main risk factors and, therefore, decreasing morbimortality.¹⁰

In Brazil, there is still the need of studies on the prevalence of cardiovascular diseases, since they are the leading cause of mortality in the population. Therefore, we decided to conduct a study intended to characterize patients with cardiovascular diseases cared for through the Unified Health System at a teaching hospital of São José do Rio Preto, State of São Paulo, Brazil, in addition to identifying the major cardiovascular diseases treated in the department and the respective patient outcomes (discharge, hospitalization, or death).

METHOD

The present study was conducted at the Emergency Department of São José do Rio Preto Base Hospital (teaching hospital) that provides care for clinical and surgical patients. This department is located in the basement of the quaternary level care hospital. It is equipped with high technology and is the reference center for the local population of the State of São Paulo and other states.

To meet the goals proposed, a descriptive and retrospective study was conducted assessing electronic medical records in order to determine the causes of admission, discharge, and death, in addition to length of hospital stay of patients with cardiovascular diseases cared for by the service through the Unified Health System at the abovementioned hospital.

The scenario of study consisted of medical records of patients treated in the emergency department of the hospital. The sample consisted of 5,761 adult patients aged 18 years or older with cardiovascular diseases cared for between January 2009 and May 2010. It was taken into consideration that a new computerized hospital information system had been implemented in June 2010 and it was going through an adjustment process.

An instrument composed of closed questions was used for data collection. The analysis of the data was performed through specific statistical tests. Qualitative data were associated using the chi-square test. The age of the patients and the length of hospital stay were compared with the cardiovascular diseases using analysis of variance (ANOVA), Tukey's *post hoc* test, Kruskal-Wallis test, and subsequent use of Dunn's multiple comparison test.

The research project was approved by the Research Ethics Committee of São José do Rio Preto Medical School/FAMERP in accordance with the Resolution 196/96 of the National Health Council, Opinion No. 165/2011. The project was part of the "Projeto Mãe" (*Mother project*) with the title "Epidemiological study of patients treated bat the emergency department of a teaching hospital".

RESULTS

A total of 5,761 medical records of patients with cardiovascular diseases cared for at the emergency department of the Unified Health System at São José do Rio Preto Base Hospital was assessed. The demographic characteristics showed that most patients were male (52.86%), with level of education of four to seven years of study (32.04%); they had a spouse/partner (42.27%), and worked in the service sector (51.22%), followed by housewives (32.60%) of white race (86.48%).

The average age of the patients was 59.65 years with a standard deviation of 17.87 years and median of 62.00 years. The data did not follow a pattern and showed numerous different low values. The minimum age

observed was 0.00 years and the maximum 106 years. The average length of hospital stay of patients (n=3,469) was 8.07 days with a standard deviation of 7.69 days and median of 6.00 days. The minimum length of hospital stay was 0.00 days and the maximum 88.00 days. These data did not follow a pattern and the distribution of length of hospital exhibited numerous different high values.

With respect to the main diagnosis, most patients had had CVA (19.60%), followed by heart failure (13.54%), angina (13.17%), and thoracic pain (12.84%). Less frequent diseases had been cardiac arrest (0.54%), bradycardia (0.61%), tachycardia (50.95%) and cardiomyopathy (1.28%). The outcome of most patients had been hospital discharge (88.57%).

The results showed a significant association between patients' sex and the International Classification of Diseases (ICD). At the same time, they suggest that diseases such as aneurysm, angina, atherosclerosis, CVA, bradycardia, cardiomyopathy, peripheral vascular disease, thoracic pain, embolism and venous and arterial thrombosis, infarction, heart failure, and tachycardia were more frequent in male patients; whereas arrhythmia, hypertension, heart failure, and trombosis were more frequent in female patients.

Table 1. Association between the ICDs and sex, race, and hospital discharge of the patients assessed. São José do Rio Preto, SP, 2009-2010.

ICD	Sex				Race				Outcome			
	Female		Male		White		Non-white		Discharge		Death	
	n	%	n	%	n	%	n	%	n	%	n	%
Aneurism	37	37.37	62	62.63	92	92.93	7	7.07	81	81.82	18	18.18
Angina	350	46.11	409	53.89	651	85.77	108	14.23	667	91.50	62	8.50
Arrhythmia	200	51.28	190	48.72	351	90.00	39	10.00	339	90.64	35	9.36
Atherosclerosis	85	44.27	107	55.73	163	84.90	29	15.10	179	94.71	10	5.29
Cerebral vascular accident	530	46.94	599	53.06	984	87.16	145	12.84	947	86.17	152	13.83
Bradycardia	10	28.57	25	71.43	30	85.71	5	14.29	27	84.38	5	15.63
Cardiomyopathy	36	48.65	38	51.35	67	90.54	7	9.46	65	94.20	4	5.80
Peripheral vascular disease	182	44.28	229	55.72	356	86.62	55	13.38	382	95.26	19	4.74
Thoracic pain	341	46.08	399	53.92	638	86.22	102	13.78	597	89.64	69	10.36
Embolism/arterial and venous thrombosis	115	49.57	117	50.43	207	89.22	25	10.78	199	90.45	21	9.55
Hypertension	169	55.23	137	44.77	276	90.20	30	9.80	247	92.86	19	7.14
Infarction	68	36.17	120	63.83	169	89.89	19	10.11	142	79.78	36	20.22
Heart failure	365	46.79	415	53.21	634	81.28	146	18.72	685	89.43	81	10.57
Cardiac arrest	18	58.06	13	41.94	25	80.65	6	19.35	6	20.00	24	80.00
Tachycardia	26	47.27	29	52.73	48	87.27	7	12.73	39	81.25	9	18.75
Thrombosis	105	60.00	70	40.00	151	86.29	24	13.71	151	89.88	17	10.12
Other	79	47.88	86	52.12	140	84.85	25	15.15	138	89.03	17	10.97
p-value	<0.001				0.003				<0.001			

With respect to race, the number of cases of diseases was greater in white patients. However, the association is linked to the fact that there was greater difference between the percentages of occurrences of diseases among non-white patients. Regarding patient outcomes, the association suggested that in most cases of diseases the patients were

discharged; however, the percentage of deaths was greater for patients who had suffered cardiac arrest (80.00% death frequency). Table 2 shows the descriptive statistics for age and length of hospital stay of patients with respect to the diseases diagnosed.

Table 2. Descriptive statistics for age relating to the ICDs. São José do Rio Preto, SP, 2009-2010.

ICD	Age		Length of hospital stay (days)	
	Mean ± Standard deviation	Median	Mean ± Standard deviation	Median
Aneurism	63.18±15.63 ^{ABCDEF}	66.00	8.17±7.95	5.50 ^{ABCDEF}
Angina	59.51±15.06 ^{DEFI}	60.00	9.85±7.74	8.00 ^A
Arrhythmia	59.66±19.03 ^{EFI}	63.50	7.38±7.15	5.00 ^{CDEF}
Atherosclerosis	66.29±12.00 ^A	67.00	5.40±4.26	4.00 ^{EF}
Cerebral vascular accident	64.36±15.75 ^A	66.00	7.24±7.60	5.00 ^{CDEF}
Bradycardia	67.20±13.28 ^{ABCDEF}	71.00	7.18±4.52	5.00 ^{CDEF}
Cardiomyopathy	32.15±23.86 ^M	26.00	7.57±7.43	5.00 ^{CDEF}
Peripheral vascular disease	59.94±15.78 ^F	61.00	5.07±4.59	4.00 ^{EF}
Thoracic pain	54.84±17.99 ^{HK}	55.00	8.72±5.93	8.00 ^A
Embolism/arterial and venous thrombosis	57.60±17.81 ^{CDEFGHIJK}	59.00	5.70±4.43	4.00 ^{EF}
Hypertension	55.31±16.99 ^{IJK}	45.00	7.28±7.26	4.00 ^{BCDEF}
Infarction	62.54±14.59 ^{ABCDEF}	63.00	6.91±5.73	5.00 ^{CDEF}
Heart failure	64.04±16.07 ^A	66.00	10.56±9.48	8.00 ^A
Cardiac arrest	60.84±18.89 ^{ABCDEFGHIJK}	65.00	3.12±5.88	0.00 ^F
Tachycardia	48.95±21.94 ^{GHJKL}	54.00	7.17±4.97	5.50 ^{ABCDEF}
Thrombosis	56.71±18.52 ^{BCDEFGHIJK}	59.00	6.50±6.10	4.00 ^{EF}
Other	43.15±27.29 ^L	51.00	10.49±11.83	6.00 ^{ABC}
p-value	<0.001 ¹		<0.001 ²	

¹ p-value related to the analysis of variance (ANOVA); means with different letters in the same column differ significantly according to *post hoc* Tukey's test (*p*<0.05); ² = *p*-value related to Kruskal-Wallis test; means with different letters in the same column differ significantly according to Dunn's multiple comparison test (*p*<0.05).

The results indicate significant differences in patients' age in the comparison of the diseases assessed, since the *p*-value was below the 0.05 significance level. The results also suggest that diseases such as cardiomyopathy, tachycardia, thoracic pain, hypertension, embolism, and thrombosis are more frequent in patients aged less than 60 years. On the other hand, the occurrence of atherosclerosis, aneurysm, CVA, bradycardia, infarction, heart failure, and cardiac arrest are more frequent in patients over the age of 60 years.

The length of hospital stay also had significant differences when compared to cardiovascular diseases (*p*<0.001). Patients who had suffered heart failure, angina, thoracic pain, tachycardia, and aneurysm exhibited certain tendency to be hospitalized over a long period of time. However, patients who had suffered cardiac arrest were those who had the shortest length of hospital stay and that fact can be linked to the severity of the disease, since it accounted for the highest mortality rate in the patients assessed. In addition to cardiac arrest, other diseases exhibited shorter length of hospital stay, such as peripheral cardiovascular disease, embolism, hypertension, atherosclerosis, and thrombosis.

DISCUSSION

Aging of population is a worldwide phenomenon. It has been occurring quickly and with its own characteristics in Brazil. Some of the main determinants of the aging process in the Brazilian population are decreased fertility rate and infant mortality coefficient, technological advances in health, and improvements in sanitation conditions and basic infrastructure.¹¹

Due to the significant increase in life expectancy, the age is increasingly related to the high occurrence of cardiovascular diseases, such as coronary artery disease, peripheral artery disease, heart failure, valvular heart disease, and CVA.¹²

A study conducted in a city of the State of Minas Gerais characterized the major risk factors for cardiovascular diseases in older adults and found a predominance in women, with an average age of 70 years and married. These data are in line with the findings of the present study. That same study indicated that smoking, sedentary lifestyle, obesity, hypertension, and diabetes mellitus are risk factors.¹²

Another study regarded acute coronary syndrome as the highest incidence of diseases. Until the menopause, there is a coronary

protection due to the action of female hormones that have an effect on these vessels. Currently, this class of diseases in women is increasingly diagnosed, since significant changes have occurred in women's lifestyle, in addition to greater exposure to risk factors, such as smoking and stress which were formerly prevalent in men.¹³

With respect to the outcome of the patients assessed, a total of 88.57% had been discharged. This finding is in line with that of a study conducted at the emergency department at a hospital of Teresina, capital city of the State of Piauí, where 68% of the patients had been discharged after being cared for.¹³

A study conducted in the State of Paraná found that cardiovascular diseases had been the leading cause of death in individuals aged 45 years or older, since most of the deaths had occurred in patients older than 65 years.¹⁴

In line with the present study, CVA had also been detected as one of the major causes of cases treated at the emergency department of a teaching hospital of São José do Rio Preto. Regarding the other cardiovascular diseases, the study also points to a larger number of cases due to precordial pain, heart failure, hypertension, and arrhythmia.¹⁵

Another study also found that the prevalence of angina and probable angina accounts for 8 and 12%, respectively. In both conditions, the highest rates had been observed among women and older adults.¹⁶

Arrhythmias are defined as any change in the normal sequence of electrical impulses, and these changes occur in the frequency, formation, or conduction of the electrical impulse in myocardium.¹⁷

A study conducted in the emergency department of a tertiary teaching hospital found that of 182 patients assessed, 62.6% had tachycardia and 37.4% bradycardia. The main causes of cardiac arrhythmia were related to heart diseases, among which cardiomyopathies were the most prevalent (23.5% in bradycardias and 21.9% in tachycardias), followed by ACS (16.2%) in the bradycardias and by cardiac valve diseases in tachycardias (14%). Chagas disease was the third most prevalent cardiac cause in both groups of cardiac arrhythmias (11.8% in bradycardias and 9.6% in tachycardias).¹⁸

A study conducted in the same emergency department in 2008 showed the characteristics of patients with acute myocardial infarction cared for at the emergency department of a teaching hospital. Most patients were white older adults; they had been discharged and the predominant

diagnosis had been acute myocardial infarction.²⁰ These results are partly in line with those of the present study and the current literature.

CONCLUSION

The findings of the present study indicate that the older adult population was the most vulnerable to cardiovascular diseases in the emergency department assessed. Since the increase in the number of people who reach advanced ages is a characteristic of the current society, measures such as the training of professionals in the medical emergency team are of the utmost importance in order to provide better care and quality treatments to patients with cardiovascular diseases.

In addition, most of the patients assessed in the present study were men, whites, and had studied for less than eight years (incomplete elementary education). Of the patients assessed, 88.57% had been discharged from hospital and the main diagnoses had been unspecified CVA (19.60%). Since they are chronic patients, hospital discharge and the beginning of the rehabilitation process of cardiac patient implies various changes in lifestyle, both for the patients and the caregivers. This way, educational measures could certainly help those caregivers in dealing with the patients, thus improving their quality of life.

Knowing the characteristics of patients with cardiovascular diseases and the factors related to prevention and treatment are important in determining the initial behavior of the patients in the emergency department of health institutions. Appropriate clinical, diagnostic and therapeutic assessment makes it possible to decrease morbimortality through the initial stratification of death risk caused by cardiovascular diseases.

For the purpose of consolidating a prospect of effective emergency care, it would be necessary to invest in some aspects, such as the improvement of hospital records of cases to prevent concealment of data, in order to encourage the planning of future actions, as well as to facilitate the process of more complex epidemiological research.

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