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Original Article

HOSPITALIZATIONS AND DEATHS DUE TO CARDIAC CONDUCTION DISORDERS AND ARRHYTHMIAS IN THE STATE OF BAHIA – BRAZIL

INTERNAÇÕES E ÓBITOS POR TRANSTORNOS DE CONDUÇÃO E ARRITMIAS CARDÍACAS NO ESTADO DA BAHIA – BRASIL

INTERNACIONES Y DEFUNCIONES POR TRASTORNOS DE CONDUCCIÓN Y ARRITMIAS CARDÍACAS EN EL ESTADO DE BAHIA – BRASIL

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Objective: to describe the profile of hospital admissions and deaths due to Cardiac conduction disorders and arrhythmias in the population in the state of Bahia – Brazil. Methods: descriptive epidemiological study using secondary data provided by the Unified Health System's Information Technology Department, corresponding to chapter 9 of the Code/International Classification of Diseases-10. The following variables were used: gender, race/color, age group, nature and system of care. Results: there were 15,249 hospitalizations and 989 deaths from January 2010 to December 2015, of which: 52.8 percent of notifications were of females, 35.9 percent of whom of the mixed race/color, and of the 60 to 79 year age group. It was noted that there were more emergency-related hospitalizations and deaths (62.6%); additionally, there were more hospitalizations in the private system (53.4%) and more deaths in the public one (75.7%). Conclusion: the results suggest that cardiac conduction disorders and arrhythmias are an important cause of hospitalizations and deaths due to their high frequency of occurrence, and it is necessary to reflect on the quality of care and the registration of this disease in the health services.

Descriptors: Heart arrhythmias. Cardiovascular diseases. Hospitalization. Mortality. Nursing.

Objetivo: descrever o perfil de internações hospitalares e dos óbitos por Transtornos de Condução e Arritmias Cardíacas na população no estado da Bahia – Brasil. Métodos: estudo epidemiológico descritivo utilizando dados secundários disponibilizados pelo Departamento de Informática do Sistema Único de Saúde, correspondentes ao capítulo IX do Código/Classificação Internacional de Doenças-10. Foram utilizadas as variáveis: sexo, raça/cor, faixa etária, regime e caráter de atendimento. Resultados: entre janeiro 2010 e dezembro 2015 ocorreram 15.249 internações e 989 óbitos, dos quais destaca-se: 52,8% notificações no sexo feminino, 35,9% de pessoas da raça/cor parda e faixa etária entre 60 e 79 anos com maior registro de casos, 44,9%. Observou-se maior número de internações e óbitos

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relacionados ao caráter de urgência, com 62,6%, e de internações no regime privado (53,4%) e de óbitos no público (75,7%). Conclusão: os resultados sugerem que os Transtornos de Condução e Arritmias Cardíacas representam importante causa de internações e óbitos pela sua elevada frequência, sendo necessário reflexão sobre a qualidade da assistência e do registro desse agravo nos serviços de saúde.

Descritores: Arritmias cardíacas. Doenças cardiovasculares. Hospitalização. Mortalidade. Enfermagem.

Objetivo: describir el perfil de internaciones hospitalarias y de las defunciones por Trastornos de Conducción y Arritmias Cardiacas en la población en el estado de Bahía – Brasil. Métodos: Estudio epidemiológico descriptivo utilizando datos secundarios disponibles por el Departamento de Informática del Sistema Único de Salud, correspondientes al capítulo IX del Código/Clasificación Internacional de Enfermedades-10. Se utilizaron las variables: sexo, raza/color, grupo de edad, régimen y carácter de atención. Resultados: entre enero de 2010 y diciembre de 2015 ocurrieron 15.249 internaciones y 989 defunciones, de las cuales se destaca: 52,8% de las notificaciones en el sexo femenino, 35,9% de personas de la raza/color parda, y grupo de edad entre 60 y 79 años con mayor registro de casos, 44,9%. Se observó mayor número de internaciones y defunciones relacionadas con el carácter de urgencia, con el 62,6%, y de internaciones en el régimen privado (53,4%) y de defunciones en el público (75,7%). Conclusión: los resultados sugieren que los Trastornos de Conducción y Arritmias Cardiacas representan una importante causa de internaciones y muertes por su elevada frecuencia, siendo necesario una reflexión sobre la calidad de la asistencia y del registro de ese agravio en los servicios de salud.

Descriptores: Arritmias cardíacas. Enfermedades cardiovasculares. Hospitalización. Mortalidad. Enfermería.

Introduction

Worldwide, cardiovascular diseases account for 20 percent of all deaths of individuals aged more than 30 years. In Brazil, they rank third as the cause of death, tending to grow to the first place[1]. These diseases include cardiac arrhythmias (CA)[2].

Heart arrhythmia mechanisms can be divided into impulse formation disorders, impulse conduction disorders or a combination of both[3]. In conduction disorders there is a slowing or even interruption of the conduction of the electrical stimulus at the His bundle level or its ramifications, which is usually associated with some type of cardiopathy. Cardiac conduction disorders and arrhythmias (CCDAs) are electrical changes in the heart that cause changes in the heart's normal rhythm, causing tachycardia, bradycardia, and irregular heart rate in impulse propagation, known as dysrhythmia or irregular heart rhythm, thus causing electrical instability[4].

These conditions may occur in people with normal hearts or in response to other diseases, electrolyte disturbances or drug intoxication. They may be asymptomatic or have manifestations such as palpitations, syncope, vertigo, mental confusion, asthenia, hypotension and precordialgia, which may progress to congestive heart failure or, in rare cases, sudden death[4].

Treatment may vary, depending on the type of arrhythmia, on symptom intensity, and on whether there is any underlying structural heart disease. Thus, treatment may involve drugs, catheter ablation or the implantation of Implantable Electronic Cardiac Devices (DCEI), such as pacemakers (MP), Implantable Cardioverter-Defibrillators (ICDs) or Resynchronizers[4].

Although it is considered a public health issue, there is a lack of literature regarding the epidemiological aspects of hospitalizations and deaths caused by these conditions, and this is no different in Brazil. Since CCDAs are often a warning sign for a more serious clinical condition[5], the lack of information makes the actual status of the issue little known, and this may cause the health teams and services to be unprepared to provide adequate care.

Hospitalization and death evaluations can be conceived as indicators of health service surveillance, and although high rates are not necessarily indicative of the need for immediate changes, they may be a warning sign for a broader investigation of the issue at the different locations[6].

In view of this, it became relevant to prepare a study on hospitalizations and deaths from CCDA that proposed to fill this gap in the state of Bahia, Brazil, to provide more information in order for it to be possible to assess the situation

specifically in this state. Thus, the purpose of this study is to describe the profile of hospital admissions and deaths from cardiac conduction disorders and arrhythmias of the population of the state of Bahia.

Method

This is a descriptive epidemiological study using secondary data provided by the Unified Health System's Information Technology Department (Datasus), available on the Internet at http://www.datasus.gov.br. The data collected refer to the period ranging from January 2010 to December 2015.

The data available on the Datasus originate from the Unified Health System's Hospital Information System (SIH/SUS), contained in the Hospital Admission Authorization Forms (AIH), managed by the Ministry of Health, through the Health Care Department, together with the State and Municipal Health Departments. The SIH is the system used to map admissions in the public hospital system; hospitalizations funded directly or covered by health insurance are not counted.

The data obtained on the Datasus website were those corresponding to Chapter 9 (Circulatory System Diseases) of ICD-10, Code 150, titled "Other conduction disorders and arrhythmias," which includes codes I44-I49 (Right fascicular block; Other forms of right bundle branch block, Trifascicular block, Nonspecific intraventricular block, Other specified forms of heart block, pre-excitation syndrome, Other specified conduction disorders, Unspecified conduction disorder).

The variables used were those that are already in the system: Number of hospitalizations and deaths, year, gender, age, color/race, and nature and system of care. The admissions correspond to the number of AIHs approved in the period, not considering those for extensions (long stay), this being an approximate number of hospitalizations, since transfers and readmissions are not computed. The deaths refer to the number of hospitalizations discharged due to death among the AIHs approved in the period. The hospitalization system, meanwhile, corresponds to the type of tie the Hospital Unit has with the Unified Health System: Public (federal, state, and municipal hospitals) and private (contracted hospitals, philanthropic hospitals, and labor union hospitals). The nature of hospitalization refers to the options, being either elective or urgency.

The set of data used for the analysis was selected and obtained through the Tabnet application from its checkboxes (row, column, and content), and the data were analyzed based on absolute frequency and percentages and organized into tables and graphs.

Regarding the ethical aspects of the study, since the data available in Datasus/Tabnet are in the public domain, there are no ethical implications, and there is no need to submit the study to the Brazil Platform.

Results

A total of 15,249 hospitalizations and 989 deaths were registered in the period ranging from 2010 to 2015. The annual hospitalization growth rate was continuous and, insofar as deaths are concerned, 2014 was the year with the highest frequency, 223 (22.5%) (Table 1).

Table 1 – Number of hospitalizations and deaths due to cardiac conduction disorders and arrhythmias in the state of Bahia, Brazil, 2010–2015.

Year	Hospitalizations		Deaths	
	n	%	n	%
2010	2,143	14.0	111	11.2
2011	2,443	16.0	155	15.7
2012	2,695	17.7	168	17.0
2013	2,655	17.4	169	17.1
2014	2,759	18.1	223	22.5
2015	2,554	16.8	163	16.5
Total	15,249	100	989	100

Source: Datasus secondary data. Tabnet (2015).

Regarding gender, the highest hospitalization frequency (52.9%) was of women. The frequency was very similar insofar as deaths are concerned: 49.3 percent for men and 50.7 percent for women (Table 2).

Table 2 – Number and percentage of records of hospitalizations and deaths due to cardiac conduction disorders and arrhythmias by gender in the state of Bahia, Brazil, 2010–2015.

Gender	Hospitalizations		Deaths	
	n	%	n	%
Male	7,174	47.1	488	49.3
Female	8,075	52.9	501	50.7
Total	15,249	100	989	100

Source: Datasus/Tabnet (2015).

Most hospitalizations (5,610; 38.8%) and deaths (219; 22.1%) from CCDA were of people of mixed color/race, followed by whites (877; 5.8% and 4.7%, respectively). There were no death records of indigenous people. Many cases were reported as "No information," both for hospitalizations (8,249; 54.2%), and for deaths (691; 69.9%) (Table 3).

Both hospitalizations (6,880; 45.1%) and deaths (414; 41.9%) increased with age, and were the highest in the 60 to 79 year age group. There was a decrease in the number of hospitalizations (2,873; 18.8%) and deaths (272; 27.5%) from the age of 80 (Table 4).

Table 5 shows hospitalizations and deaths with regard to care nature and system, indicating that the number of hospitalizations and deaths was higher in emergency services (61.1% and 86.9%, respectively). The Private Sector accounts for most hospitalizations (8,141; 53.4%), but regarding deaths, it is the public sector that has the highest frequency (749; 75.7%).

Table 5 – Number and percentage of records of hospitalizations and deaths due to cardiac conduction disorders and arrhythmias per age group in the state of Bahia, Brazil, 2010–2015.

Variable	Hospitalizations		Deaths	
	n	%	n	%
Nature of the care				
Elective	5,937	38.9	130	13.1
Emergency	9,312	61.1	859	86.9
Care system				
Public	7,108	46.6	749	75.7
Private	8,141	53.4	240	24.3

Source: Datasus/Tabnet (2015).

Discussion

CCDAs are an important cause of hospitalization because of their frequency, since they rank fifth in the list of cardiovascular disease morbidities that most affected the Brazilian population between 2010 and 2015[7].

During this period, 344,078 hospitalizations and 28,888 deaths were recorded in Brazil, and among the regions most affected by this condition, the Northeast ranked third, with 47,555

Table 3 – Number and percentage of records of hospitalizations and deaths due to cardiac conduction disorders and arrhythmias by color/race in the state of Bahia, Brazil, 2010–2015.

Color/race	White		Black		Mixed		Yellow		Indigenous		No information		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Hospitalizations	877	5.8	484	3.2	5,610	36.8	26	0.1	3	0	8,249	54.2	15,249	100
Deaths	46	4.7	31	3.1	219	22.1	2	0.2	-	-	691	69.9	989	100

Source: Datasus/Tabnet (2015).

Table 4 – Number and percentage of records of hospitalizations and deaths due to cardiac conduction disorders and arrhythmias per age group in the state of Bahia, Brazil, 2010–2015.

Age group	< 20 years		20 to 39		40 to 59		60 to 79		≥ 80		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Hospitalizations	486	3.2	1,359	8.9	3,650	23.9	6,880	45.1	2,873	18.8	15,249	100
Deaths	36	3.6	77	7.8	190	19.2	414	41.9	272	27.5	989	100

Source: Datasus/Tabnet (2015).

hospitalizations and 3,838 deaths. In this context, Bahia ranked first, with 15,249 cases, or 32.1 percent of the hospitalizations due to CCDA, and second in deaths, with 989 (25.8%) cases, in the Northeast region. These results allow one to deduce that, despite the progress that has been made in the therapeutic management of CCDAs, deaths related to them remain one of their serious complications.

This high number of hospitalizations can serve as a warning signal for the development of strategies for analyzing and searching for explanations for their occurrence, considering that many of these hospitalizations could be avoided by better performance in primary care[6]. A study carried out in a city of São Paulo to verify the association between cardiocirculatory diseases and hospital admissions in patients served by the Unified Health System indicates that arrhythmia, together with acute myocardial infarction, are the main factors responsible for hospitalizations in a 12-month period[8].

It was noted that there was an almost constant increase in records of hospitalizations caused by CCDAs and that females were the most affected. One of the explanations may be the fact that women commonly experience cardioprotective hormone depletion after the age of 50[8]. A study carried out on the prevalence of hospital admissions and associated factors in an urban center in Southern Brazil found that more women than men were hospitalized, the highest number being in the age group of 60 years or older[5].

Regarding the number of deaths, the highest frequency was among men, which can be explained by the fact that they are those most affected by fatal chronic diseases, and, also, by their lack of interest in seeking health services, when compared to women who are more caring about their health[9].

Considering that cardiovascular diseases are the main causes of death in the world, with a greater impact in low- and middle-income countries, and that this impact is not only related to mortality, but also to hospitalizations[10], deaths from CCDAs contribute to an important part of this serious public health issue. Because they are more common than death, hospitalizations can help detect how this condition is occurring in a population and, thus, assist in the creation of strategies to prevent and reduce the damage they cause.

The highest frequency of hospitalizations and deaths from CCDAs was in the color/mixed race, which represents the profile of the population of Bahia, since according to the Brazilian Institute of Geography and Statistics (IBGE), this population comprises mostly black and mixed-race people (83.7%)[11]. Because of their biological characteristics, afro-descendants are more likely to have cardiovascular diseases[12,13].

There were no records of deaths in indigenous populations, although several studies point to an increase in cardiovascular diseases in this population, justified by the indigenous people's contact with non-indigenous peoples, which has changed their life habits and, especially, their diet[14,15,16]. A study carried out aiming to present mortality estimates for indigenous and non-indigenous people in different age groups, based on data from the 2010 Demographic Census, pointed to marked differences, with much higher levels of mortality among indigenous people in all age groups considered and among both genders[17]. To the author, in Brazil, despite the fact that the adult indigenous population has less favorable health and socioeconomic indicators than the non-indigenous one, there is a lack of research on morbidity and mortality in this population. However, regarding hospitalization and death records, based on the information currently available in Brazil, it is unfortunately not possible to deepen analyses about these morbidity and mortality conditions among indigenous peoples.

The large number of cases reported as "No information" may likely be due to SIH/SUS underreporting, distorted information, and, also, to the fact that some municipalities have precarious technology conditions[18]. The SIH is based on the medical report, which is the document used to request the hospitalization of patients in hospitals that provide care to the SIH/SUS and, although this document must have all its fields properly completed, this is not always the case. In Brazil, SIS data quality monitoring is not based

on a regular, Ministry of Health-standardized evaluation plan, and its data is little reliable, thus impairing information quality[19]. Thus, it is not possible to state precisely which race/color is the most frequent in hospitalizations and deaths from CCDA.

Regarding the age group, it was observed that elderly people aged 60 to 79 years were the most affected. This is due to the many changes that occur in the cardiovascular system with aging, as well as to the Brazilian people's increased life expectancy. Cardiovascular diseases are more common among the elderly, accounting for most of the hospitalizations and mortality in this group[20,21]. Considering that population aging is a current phenomenon and that in itself it contributes to the increased risks of cardiovascular diseases, new challenges are emerging for health sector managers and professionals[22].

Concerning hospital admissions, it is noted that emergencies are more frequent than elective hospitalizations. It is important to emphasize that CCDAs are considered as unforeseen health impairments with or without a potential threat to life, the patients of which need immediate medical attention[23]. A study carried out at a University Hospital showed that almost 32 percent of all patients who got care for CA in the emergency room had clinical instability; however, only two of the 40 deaths were directly related to CA[5]. These findings allow us to reflect on the need for health professionals and services to be well prepared to respond to such occurrences and to prevent fatal events.

Regarding nursing care and considering the result of a study on "nurse behaviors in cardiac arrhythmias" that found that nurses are not aware of how to identify cardiac arrhythmias and care protocols for the provision of care, a fact that may interfere directly and negatively in the prognosis of patients with cardiac arrhythmias[24], it is worth considering the need to train these professionals to ensure quality care.

Insofar as the care system is concerned, there is a small difference in the number of hospitalizations in the public and private sectors. However, when analyzing the number of deaths in the two systems, it can be seen that the public sector surpasses the private one by more than 70 percent of the registered cases. This result leads to these questions: "Do patients hospitalized in the public system have a more severe clinical picture?" "Do public hospitals not have adequate care conditions?" or "Are the two conditions simultaneous or are there other conditions involved as well?" It is known that the mortality burden, especially premature deaths due to cardiovascular diseases, affects mainly the population in the most vulnerable socioeconomic situations.

Conclusion

It can be verified that CCDAs in the state of Bahia account for a significant proportion of hospital admissions and deaths in both public and private hospitals accredited by the Unified Health System, and special attention is needed from the health sector to reduce the morbidity and mortality they cause.

The study also indicates that women are the ones who are hospitalized and die the most from CCDAs, as well as the population aged 60 to 79 years and those hospitalized as a matter of urgency. Due to the lack of race/color data, it was not possible to conclude precisely which one was the most affected. Regarding the care system, it is noteworthy that most deaths occurred in the public system, while most hospitalizations were in the private system.

In addition to confirming the importance of using the SIH/SUS database as a very useful instrument to get to know and evaluate a population's health conditions and health services, this study also gives health professionals an opportunity to reflect on this issue, being especially useful for nurses to rethink their practice based on these data, and to encourage other studies with this theme.

As a limitation, it is worth mentioning that the analyses of studies that use secondary data may be compromised due to possible underreporting and because the Datasus/Tabnet, despite providing important information about hospital care, contains a high percentage of incomplete data, such as color/

race, as well as the absence of the types of CCDA that lead to hospitalizations/deaths.

Another limitation that can be mentioned is the lack of literature on the topic to further deepen the discussion, showing the need for research that provides more information about the profile of hospitalizations and deaths caused by CCDA.

Collaborations

1. design, project, analysis and interpretation of the data: Liliane Ferreira Moura, Angela Conceição Sena Maltez, Catia Suely Palmeira e Maria de Lourdes de Freitas Gomes.

2. article writing and critical review of the intellectual content: Liliane Ferreira Moura, Angela Conceição Sena Maltez, Catia Suely Palmeira e Maria de Lourdes de Freitas Gomes.

3. final approval of the version to be published: Liliane Ferreira Moura, Angela Conceição Sena Maltez, Catia Suely Palmeira e Maria de Lourdes de Freitas Gomes.

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