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CARDIOVASCULAR DISEASES IN THE PRE-PANDEMIC PERIOD AND DURING THE PANDEMIC IN VITÓRIA

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Objective: To describe cardiovascular diseases in the pre-pandemic period and during the pandemic in Vitória.

TOPIC: Cardiovascular diseases.

Abstract: Introduction: Cardiovascular diseases (CD) comprise a group of diseases of the heart and blood vessels. The *Coronavirus disease 2019 pandemic* has caused an increase in complications arising from these diseases globally. **Objective:** To describe the prevalence of cardiovascular diseases in the pre-pandemic period and during the pandemic in the metropolitan macro-region of the state of Espírito Santo. **Method: A descriptive epidemiological statistical study** was carried out based on hospitalization and mortality rates due to CD in the metropolitan macro-region of the state of Espírito Santo, between 2018 and 2021. The data were collected from the platform of the Information Technology Department of the Unified Health System (DATASUS) and organized into graphs. **Results:** The study provided a description of hospitalizations and deaths due to CD each year between 2018 and 2021. The graphs revealed an increase in the mortality rate in 2020 and a drop in the data analyzed during the pandemic period. **Discussion:** The increase in deaths, which represented 7.32% in 2020, establishes an intrinsic relationship with the pandemic scenario. In 2020-2021, there was a 1.09% drop in deaths from CD, due to the peak in this rate in 2019-2020 for more severe conditions, stabilizing deaths among less severe cases. The observed data reveal the intervention of the analyzed pandemic context, such as the likely decrease in medical monitoring of patients and underreporting of cardiovascular diseases and, therefore, require constant updates. **Conclusion:** This study highlighted the high rates of CD. Its results attest to the influence of the pandemic on the prevalence and care of CD in Vitória. The

limited variables addressed reveal the need for additional studies on the subject.

Keywords: Cardiovascular Diseases. Mortality. Hospitalization. Pandemic. Epidemiology.

INTRODUCTION

The World Health Organization (W.H.O.) defines cardiovascular diseases (CD) as a group of diseases of the heart and blood vessels. They are divided into six large groups: coronary disease, cerebrovascular disease, peripheral arterial disease, deep vein thrombosis and pulmonary embolism, congenital heart disease and rheumatic heart disease. To prevent the development of CD, the main focus is the exclusion of risk factors and adherence to a healthy lifestyle. Excessive alcohol consumption, tobacco use, unbalanced diets and lack of physical activity are attitudes that must be avoided. Furthermore, early diagnosis is extremely important for defining the most appropriate treatment and reducing mortality rates (PAN AMERICAN HEALTH ORGANIZATION, 2021).

The *Coronavirus disease 2019* (COVID-19) pandemic has caused an increase in cases of complications resulting from CD globally. This fact can be explained by the change in people's lifestyle, who have adopted unhealthy habits, and the lack of medical monitoring, which makes early diagnosis and monitoring of pre-existing disease difficult. Other factors, such as stress and high levels of depression, were also linked to the increase in CD during this period. The Brazilian Society of Cardiology (2020) carried out a survey regarding the number of deaths from CHD that confirms the increase in this rate in Brazil and bringing as the main reason the fear of going to the hospital.

Attention to the characteristic symptoms of CD must be frequent, especially in the current scenario, where hospital prevention and social interaction are restricted. Symptoms such as pain and discomfort in the chest, frequent tiredness, difficult breathing and fainting must be considered warning signs for a more thorough investigation into the individual's health.

The significant increase in CD cases and the mortality rate related to these pathologies highlights the importance of studying the topic for society, especially in the large capitals of Brazil. That said, the present study aims to describe the prevalence of cardiovascular diseases in the pre- and pandemic period, from 2018 to 2021, in the metropolitan macro-region of the state of Espírito Santo.

METHOD

For the research, a descriptive statistical study of an epidemiological nature was carried out based on data on hospitalization and mortality rates due to CD recorded in the Metropolitan Region of Vitória, encompassing the following cities: Vitória, Serra, Cariacica, Vila Velha, Viana, Guarapari and Fundão. To carry it out, during the information survey, the research tool on the platform of the Department of Informatics of the Unified Health System (DATASUS) was used. in order to compare the number of hospitalizations, deaths and mortality rate from diseases of the circulatory system in the Metropolitan Region of Vitória during the period from 2018 to 2021. Data from the SUS Hospital Morbidity (SIH/SUS) by residence in the Metropolitan Region – RIDE of Vitória, reported from 2018 to 2021, were selected. All diseases classified in Chapter IX - Diseases of the Circulatory System (I00-I99) were selected, from the International Classification of Diseases and Related Health Problems, 10th Revision (ICD-10), with the following data obtained: total hospitalizations, total deaths and mortality rate (deaths/hospitalizations). Data collection and tabulation took place in June 2021. The data was tabulated in the *Microsoft Word 2019*

(16.0) program, analyzed and presented using graphs.

Ethical considerations: As this is an epidemiological study with secondary data and in the public domain, there was no need for submission to the Research Ethics Committee, in accordance with resolution 466/2012 of the National Health Council.

RESULTS

The study was divided into two aspects. In the first aspect, the first two graphs indicate hospitalizations, deaths and mortality rate and evolution of each year separately, in the period from 2018 to 2021 for a broader understanding of the findings. The period of 2021 only comprises the initial third of the year (January to April) and therefore the total numbers of hospitalizations and deaths only serve as a parameter for projection based on the mortality rate. The second aspect sought to expose data in the pre-pandemic and pandemic period. With this, the pre-pandemic period was established from January 2019 to February 2020. The pandemic period comprises the initial month of the pandemic, March 2020 according to the WHO and reported by the Pan American Health Organization (2020), until the last month with data available in DATASUS, April 2021.

The rate of hospitalizations and deaths was analyzed in the period 2018-2021 and is represented in graph 1. In complete years, hospitalizations had their lowest number in 2020 when analyzed by the months considered. There was a decrease of 327 hospitalizations between 2018 and 2020, but an increase of 35 in death cases.

From the graphs presented, the relevance of 2020 can be seen due to the increase in the mortality rate in the period, even with the decline in the number of hospitalizations and deaths. Furthermore, the drop-in rates during the pandemic period compared to the pre-pandemic period is visible.

DISCUSSION

Coronary artery disease is the leading cause of death worldwide and represents 16% of total deaths, according to the 2019 Global Health Estimates (WORLD HEALTH ORGANIZATION, 2020). Therefore, the need to analyze how this and other cardiovascular diseases are related is explained, in order to avoid them, including in a pandemic context. Furthermore, during the pandemic, it was reported that these illnesses can produce adverse clinical outcomes in patients with COVID-19 (XIONG et al., 2020 apud TESSITORE et al., 2021), which endorses the theme and need for this study.

In the analysis of the gross numbers of hospitalizations and deaths due to cardiovascular diseases (Graph 1), a relative decrease was noted between the years 2019 and 2020, in contrast to the expected increase between 2018 and 2019. The gross numbers between 2020 and 2021, given the difference in the period studied. Despite this contraction observed in 2020-2021, the 2020 mortality rate presented in graph 2 was 7.32%, higher than that observed in the previous two years.

Considering the scenario explained in the context of the pandemic, an intrinsic relationship is established between the two, since the global population felt victimized by the vulnerability brought by the pandemic. Luciano *et al.* (2021) highlights the hypothesis, saying that, when the patient started to feel less safe leaving home and going to public places in order to avoid being infected, they also stopped going to medical centers to prevent and/or treat possible diseases, with emphasis on pre-existing CD, especially in the initial months.

Therefore, it is believed that many patients have interrupted professional follow-up
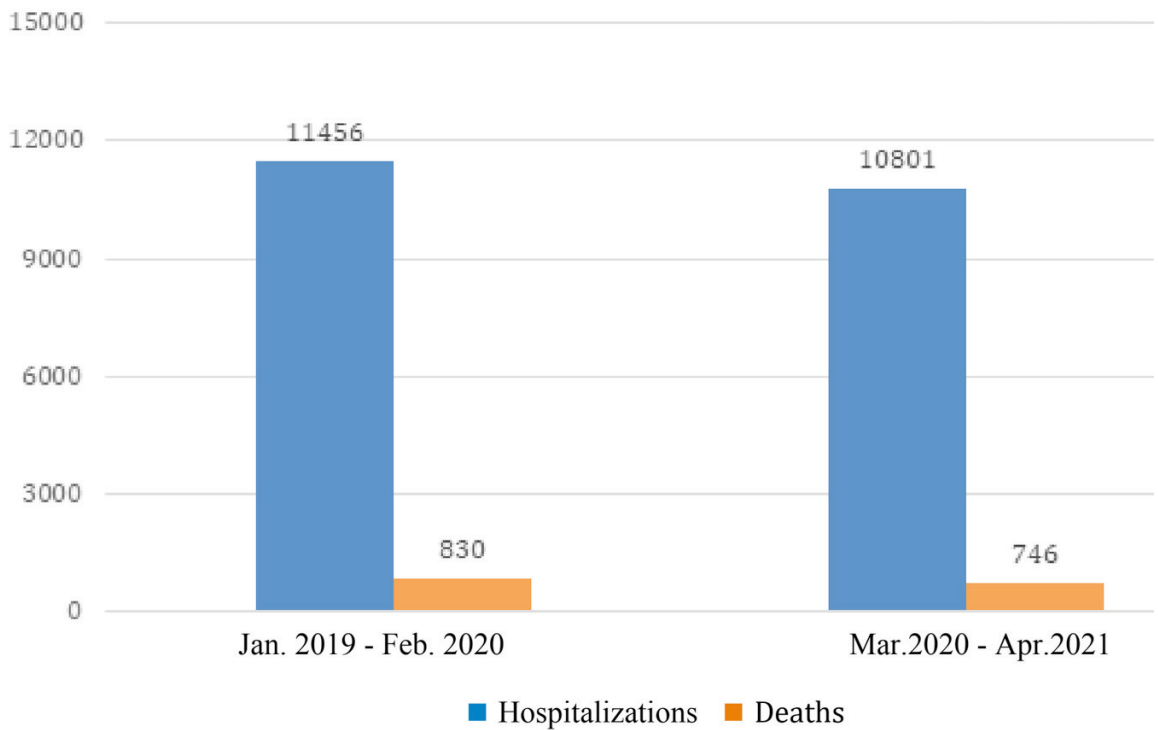
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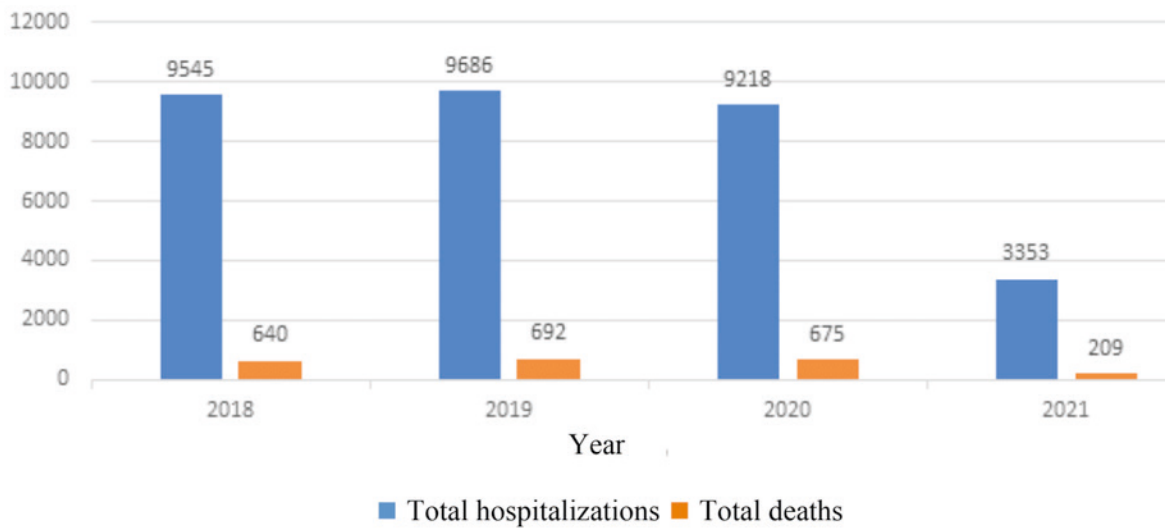
Graph 1: Rate of hospitalizations and deaths in the period 2018-2021.

Source: Ministry of Health - SUS Hospital Information System (SIH/SUS)
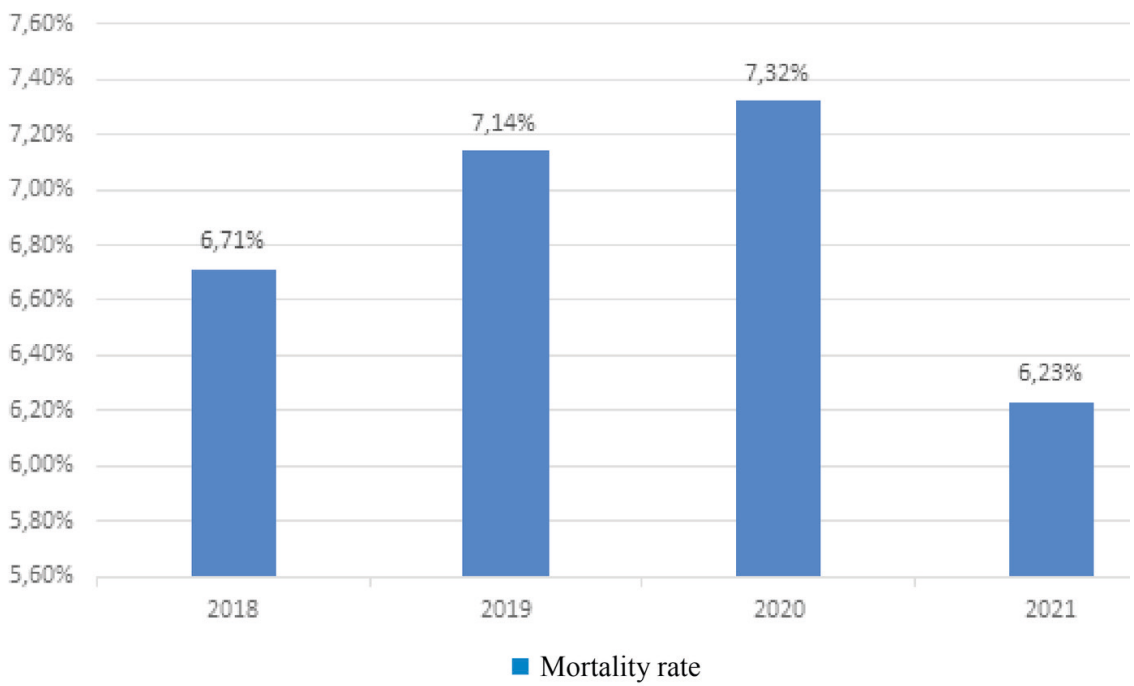
Note: Adapted

Graph 2: Mortality rate in the period 2018-2021.

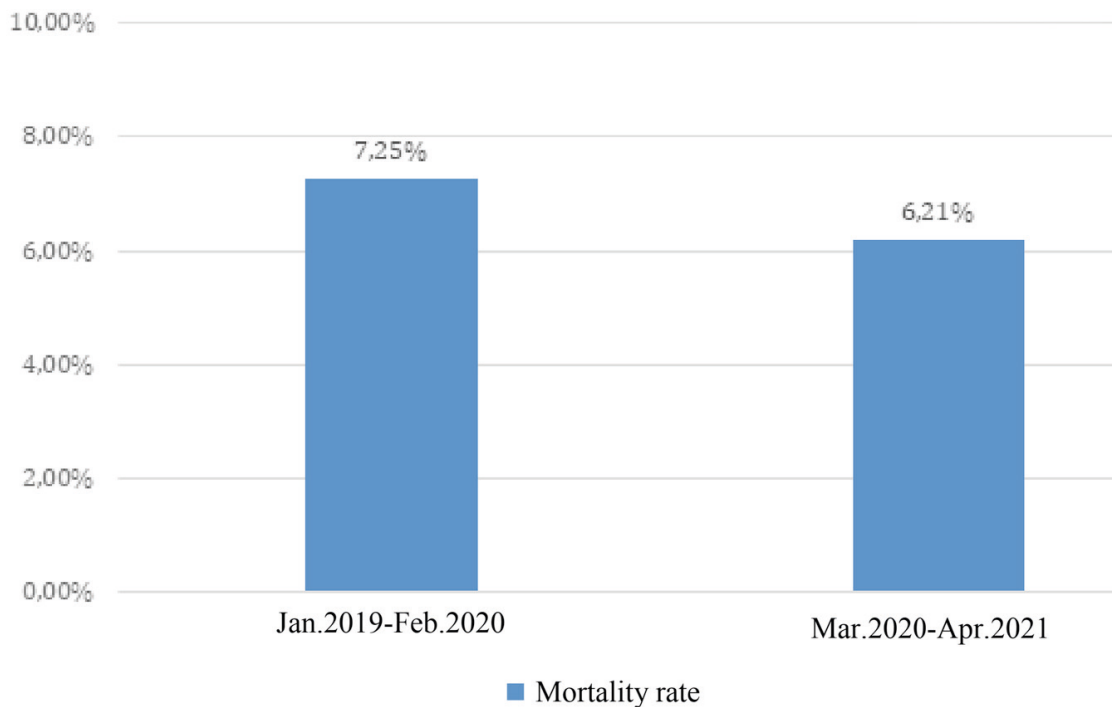Source: Ministry of Health - SUS Hospital Information System (SIH/SUS)

Note: Adapted

Graph 3: Hospitalizations and deaths in the pre-pandemic and pandemic periods
Source: Ministry of Health - SUS Hospital Information System (SIH/SUS)
Note: Adapted

Graph 4: Mortality rate in the pre-pandemic and pandemic periods.
Source: Ministry of Health - SUS Hospital Information System (SIH/SUS)
Note: Adapted

services and, in addition, those who needed urgent treatments for CD were harmed by the intense focus of the health system on treating COVID-19. Luciano *et al.* (2021) exemplifies the reality with a 2020 New York Times article by Dr. Harlan M. Krumholz, in which he emphasizes the sharp drop in the number of hospital admissions for Acute Myocardial Infarction (AMI) and Cerebral Vascular Accident (CVA), in New York and also within a cardiology reference center in Santa Catarina, where 21.7% of the beds were available only to help combat COVID-19, reducing them for other diseases.

The mortality rate of the population of Vitória Metropolitan Region (Graph 2) continued to increase until 2020, as occurred between 2018 and 2019, however, there was a 1.09% drop in this rate between 2020 and 2021 This result can be explained by the decrease in the number of deaths from diseases of the circulatory system in 2021, as people with CD suffered to a large extent during the beginning of the pandemic (2020). One study found that, of 138 people hospitalized with COVID-19, 44.4% of those in the Intensive Care Unit (ICU) had cardiac arrhythmia, stabilizing the mortality trend in the subsequent year (WANG *et al.*, 2020 *apud* LIU *et al.*, 2020). Another viable highlight is the resumption of treatments and/or follow-ups that had been suspended during the first months of the pandemic. Due to a greater understanding of the care needed for COVID-19, patients felt more comfortable clarifying possible symptoms and continued with medical supervision.

In Graph 3, it is possible to observe a reduction, in raw numbers, in the months in the periods considered pre-pandemic and pandemic, in the number of hospitalizations and the number of deaths. In relation to the number of hospitalizations, a reduction of 5.7% was observed due to the pandemic months of 2020, which had approximately 768 hospitalizations per month, in contrast to the approximate 838 hospitalizations per month in 2021. The number of deaths, in turn, suffered a reduction of 10.1% due to the months of 2021, with fewer deaths. It is possible that this reduction is caused by a lack of data, given the emergence of the health system with COVID-19 or, in this sense, deaths from CD in individuals who contracted SARS-CoV-2 were ignored.

Mortality rates reduced when comparing pre-pandemic and pandemic periods (Graph 4), this is due, to a certain extent, because of the analyzed time scale of 2021, in which mortality decreased by 1.09% between 2020 and 2021 and contributed to reducing the percentage of people who died during the pandemic period. In contrast to what was observed, Abdelaziz *et al.* (2020) estimates that the mortality rate from diseases of the circulatory system will increase due to the delay in necessary care for symptoms. This fact is in line with what was observed in this study, given that deaths from CD in the Metropolitan Region of Vitória decreased during the pandemic and, therefore, may represent an indirect factor for deaths considered to be due to COVID-19.

It must be added that in this research current articles of relevance to the study were used, which helped to demonstrate elements of importance for understanding the triggering of CD correlated to mortality rates, targeting the pandemic period and its predecessor. Therefore, this study has some limitations: it considers the period from 2018 to 2021, the search in just one database, DATASUS, and the probable underreporting of CD cases due to COVID-19 cases masking the influence of these diseases upon the death of the individual, which is data that will continue to be updated due to the continuity of the current scenario, which cannot yet be considered post-pandemic.

CONCLUSION

This descriptive statistical study of an epidemiological nature, based on data on hospitalization and mortality rates due to CD recorded in Vitória region, showed the high rates of cases of these diseases. The results attest to the influence of the COVID-19 pandemic on CD care in Vitória. The exceptional nature of the pandemic, still in force, shows that the real nature of this influence remains in need of definition, since the findings show a new facet of the studies carried out to date, as the number of deaths has decreased along with the number of hospitalizations.

The limited variables addressed in this work, as well as a possible inconsistency in the numbers obtained in the database, reveal the need for additional studies on the subject. However, even with these limitations, the need to improve the treatment of the topic is evident. Thus, carrying out this work directly contributes to national production on the subject, as it is a study that highlights cardiovascular diseases in the pre- and pandemic periods.

THANKS

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8