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EPIDEMIOLOGICAL PROFILE OF PATIENTS WITH CARDIOPULMONARY ARREST TREATED IN AN EMERGENCY CARE UNIT

Perfil epidemiológico de pacientes em parada cardiorrespiratória atendidos em unidade de pronto atendimento

Perfil epidemiológico de pacientes con paro cardiorrespiratório atendidos en una unidad de atención de urgências

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RESUMO

Objetivo: caracterizar o perfil epidemiológico de pacientes em parada cardiorrespiratória atendidos na unidade de pronto atendimento. **Método:** estudo documental, transversal, retrospectivo e quantitativo, realizado na unidade de pronto atendimento Oceania, João Pessoa- Paraíba, com 126 prontuários de pacientes com idade ≥18 anos, com parada cardiorrespiratória no período de 2020 a 2024. os dados foram analisados no programa estatístico statistical package for the social sciences versão 26 e aprovado sob parecer 7.030.124. **Resultados:** prevaleceu o sexo masculino, procedentes de João Pessoa, faixa etária ≥51 anos, pardos, casados, ensino fundamental incompleto, predominância de hipertensão arterial e diabetes mellitus. fatores como tabagismo, sedentarismo, obesidade e choques cardiogênico e séptico, com alta prevalência entre as causas da parada

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cardiorrespiratória. **Conclusão:** os resultados contribuem para o aprimoramento de estratégias de prevenção, identificação precoce de riscos e intervenções eficazes em unidades de urgência.

DESCRITORES: Parada cardiorrespiratória; Serviços médicos de emergência; Perfil epidemiológico;

ABSTRACT

Objective: to characterize the epidemiological profile of patients experiencing cardiopulmonary arrest and receiving treatment in an emergency care unit. **Method:** cross-sectional, retrospective, quantitative documentary study conducted at the Oceania Emergency Care Unit in João Pessoa, Paraíba, using 126 medical records of patients aged ≥18 years who experienced cardiopulmonary arrest between 2020 and 2024. Data was analyzed using the Statistical Package for the Social Sciences (SPSS), version 26, and the study was approved under opinion number 7.030.124. **Results:** most patients were male, from João Pessoa, aged 51 years or older, of mixed race, married, and had an incomplete primary education. The most common comorbidities were arterial hypertension and diabetes mellitus. Risk factors such as smoking, a sedentary lifestyle, obesity, and cardiogenic and septic shock were prevalent causes of cardiopulmonary arrest. **Conclusion:** the results contribute to improving prevention strategies, identifying risks early, and implementing effective interventions in emergency units.

DESCRIPTORS: Cardiopulmonary arrest; Emergency medical services; Epidemiological profile.

RESUMEN

Objetivo: caracterizar el perfil epidemiológico de pacientes en paro cardiorrespiratorio atendidos en la unidad de atención de urgencias. **Método:** estudio documental, transversal, retrospectivo y cuantitativo, realizado en la unidad de atención de urgencias Oceanía, en João Pessoa, Paraíba, con 126 historias clínicas de pacientes de edad ≥18 años con paro cardiorrespiratorio entre 2020 y 2024. los datos fueron analizados mediante el programa estadístico statistical package for the social sciences, versión 26, y el estudio fue aprobado bajo el dictamen 7.030.124. **Resultados:** predominó el sexo masculino, procedentes de João Pessoa, edad ≥51 años, raza mixta, casados y educación primaria incompleta. las comorbilidades más frecuentes fueron hipertensión arterial y diabetes mellitus. factores como tabaquismo, sedentarismo, obesidad y los choques cardiogénico y séptico presentaron alta prevalencia entre las causas del paro cardiorrespiratorio. **Conclusión:** los resultados contribuyen al perfeccionamiento de estrategias de prevención, identificación temprana de riesgos e intervenciones eficaces en unidades de urgencias.

DESCRIPTORES: Paro cardiorrespiratorio; Servicios médicos de urgencia; Perfil epidemiológico.

INTRODUCTION

Cardiovascular diseases pose a significant threat to public health in Brazil and around the globe. According to the Brazilian Society of Cardiology (SBC), approximately 14 million Brazilians suffer from some type of heart disease. Of these cases, about 400 thousand results in death each year, equivalent to approximately 30% of all registered deaths in the country. Ischemic heart disease is the main cause of cardiopulmonary arrest (CPA).[1]

CPA is a prevalent event with high morbidity and mortality. It occurs when the heart stops beating and there are no signs of circulation. In other words, there is a lack of vital signs, such as responsiveness, pulse, and regular breathing. This critical outcome can vary depending on the patient's age and the location of the event. Reversing CPA and achieving a positive outcome depend on rapidly identifying the condition and effectively applying resuscitation measures.[2]

Outside of a hospital environment, the most common cardiac rhythms associated with cardiac arrest are ventricular fibrillation (VF) and pulseless ventricular tachycardia (PSVT). These rhythms account for approximately 80% of cardiac arrest events. In the hospital setting, however, the heart rhythms most associated with CPA are non-shockable rhythms such as pulseless electrical activity (PEA) and asystole. These rhythms are associated with a poor prognosis and lower survival rates.[3]

Cardiac arrest has been linked to high mortality rates worldwide, and prognosis is closely related to the quality of resuscitation maneuvers implemented. Therefore, CPA is a medical emergency of great concern because a fast, safe, and effective response is directly related to the patient's survival. Understanding the risk factors, patterns of occurrence, and most effective treatment options is essential to reducing the associated mortality.[4]

In the context of the Emergency Care Network, Emergency Care Units (UPAs) play a vital role in providing medium-

complexity care to patients in acute and emergency situations. UPAs collaborate closely with all levels of care in the Unified Health System (SUS) to stabilize critically ill patients and refer those in need of highly specialized care to hospitals or specialized units.

Many patient-related variables can influence the occurrence of CPA, so it is important to understand the epidemiological profile associated with CPA in patients treated in emergency care units (UPAs). This includes examining the variables related to age, sex, medical history, and cardiovascular risk factors in detail. This knowledge is essential for directing available resources properly, establishing effective care protocols, preventing future cases, and continuously improving the quality of care provided.

Based on the theoretical assumptions that support the research, this study hypothesizes that: Variables related to the patient's epidemiological profile influence the occurrence of CPA in the prehospital context. Thus, to guide the present research, the following question arises: What is the epidemiological profile of patients in cardiopulmonary arrest who are treated at an emergency care unit?

METHOD

This cross-sectional, retrospective, documentary study employed a quantitative approach to investigate epidemiological variables of patients with cardiopulmonary arrest treated at the Emergency Care Unit (UPA) through medical records.

The study population consisted of 630 adult and elderly patient records diagnosed with cardiopulmonary arrest and treated at the Emergency Care Unit (UPA Oceania) in João Pessoa, PB, between June 2020 and June 2024. Based on the inclusion and exclusion criteria of the research, a sample of 126 records (20%) were taken from this universe.

Medical records of patients aged 18 years or older who were diagnosed with cardiopulmonary arrest and treated between June 2020 and June 2024 were included in the study. The research attributes sought and analyzed in this study consist of information on the population profile (sociodemographic data) and clinical outcomes (discharge, transfer, or death). Medical records that were inadequately filled out or lacked crucial information necessary to complete the data collection instrument were excluded.

Data collection took place from August to September 2024 based on the transcription and systematization of the selected sample's medical records. A form-type instrument was prepared for the specific purpose of this research and tested for reliability by two emergency experts. The form provided a structure that included sociodemographic variables, medical history, diagnosis, intervention, treatment, and clinical outcome (discharge, transfer, or death) for the individuals studied.

The data were tabulated in Excel and analyzed using descriptive and inferential statistics in the Statistical Package for the Social Sciences (SPSS), version 26.0. The descriptive analysis used the absolute and relative frequencies of the data, while the inferential analysis used Pearson's chi-square association test or Fisher's exact test.

Fisher's exact test was used when the number of saddles with a frequency of less than five was greater than 20%. A significance level of 5% ($p<0.05$) was used for all tests. This statistical analysis was conducted to identify patterns and trends in the data. The results were interpreted and discussed in the context of the existing literature to provide a comprehensive understanding of the findings.

The Research Ethics Committee of the Health Sciences Center of the Federal University of Paraíba (CCS/UFPB) approved this research project under CAAE 81919224.3.0000.5188. The project was conducted in accordance with the guidelines established by Resolution No. 466/2012 of the National Health Council (CNS), which establishes guidelines and regulatory standards for research involving human beings.[7]

RESULTS

The following tables show data related to sociodemographic characteristics (Table 1); comorbidities and risk factors (Table 2); causes of CPA and pre-CPA events (Table 3); the association between medication use in CPA and sociodemographic and clinical variables of the sample (Table 4).

Table 1 – Distribution of the participants' sociodemographic data. João Pessoa, PB, Brazil, 2024 (n=126)

Variables	**n**	**%**
Sex		
Female	57	45,2
Male	69	54,8
Origin		
João Pessoa	122	96,8
Other	4	3,2
Age		
18 to 20 years old	1	0,8
21 to 30 years old	3	2,4
31 to 40 years old	4	3,2
41 to 50 years old	8	6,3
51 or older	110	87,3
Skin color		
Ignored	38	30,2
White	32	25,4
Black	8	6,3
Brown	46	36,5
Yellow	1	0,8
Indigenous	1	0,8
Marital status		
Ignored	51	40,5
Single	20	15,9
Married/common-law partnership	26	20,6
Separated/divorced	7	5,6
Widower	22	17,5
Education		
Ignored	74	58,7
Complete primary school	6	4,8
Incomplete primary school	14	11,1
Complete high school	12	9,5
Higher education	9	7,1
No education	11	8,7

Upon analyzing the sociodemographic data of the interviewees, it was found that most are male (n = 69; 54.8%), from João Pessoa (n = 122; 96.8%), aged 51 years or older (n = 110; 87.3%), of brown skin (n = 46; 36.5%), married (n = 26; 20.6%), and have an incomplete primary education (n = 14; 11.1%).

Table 2 – Distribution of the absolute and relative frequency of variables related to comorbidities and risk factors of the participants. João Pessoa, PB, Brazil, 2024 (n=126)

Variables	n	%
Comorbidities		
SAH		
Yes	64	50,8
No	62	49,2
Diabetes Mellitus		
Yes	47	37,3
No	79	62,7
Coronary Artery Disease		
Yes	2	1,6
No	124	98,4
Chronic Kidney Disease		
Yes	4	3,2
No	122	96,8
Arrhythmias		
Yes	0	0,0
No	126	100,0
Chronic Obstructive Pulmonary Disease		
Yes	4	3,2
No	122	96,8
Cancer		
Yes	7	5,6
No	119	94,4
Alzheimer 's		
Yes	8	6,3
No	118	93,7
Heart failure		
Yes	7	5,6
No	119	94,4

Variables	n	%
Other		
Yes	11	8,7
No	115	91,3
Ignored		
Yes	29	23,0
No	97	77,0
Risk factors		
Smoking		
Yes	14	11,1
No	112	88,9
Alcoholism		
Yes	3	2,4
No	123	97,6
Heart Disease		
Yes	16	12,7
No	110	87,3
Heart failure		
Yes	2	1,6
No	124	98,4
Sedentary lifestyle		
Yes	6	4,8
No	120	95,2
Obesity		
Yes	6	4,8
No	120	95,2
Stroke		
Yes	0	0,0
No	126	100,0
Ignored		
Yes	90	100,0
No	36	28,6

The analysis of absolute and relative frequencies of clinical data on comorbidities and risk factors revealed that hypertension was the most prevalent disease (n = 64; 50.8%), followed by diabetes mellitus (DM) (n = 47; 37.3%) and other diseases (n = 11; 8.7%). Regarding risk factors, heart disease stood out with 16 cases (12.7%), followed by smoking with 14 cases (11.1%) and a sedentary lifestyle and obesity with six cases (4.8%).

Table 3 – Distribution of clinical variables related to the causes of CPA and pre-CPA events of the participants. João Pessoa, PB, Brazil, 2024 (n=126)

Variables	n	%
Causes of Cardiopulmonary arrest		
Hyperkalemia	6	3
Yes	7	5,6
No	119	94,4
Acute Myocardial Infarction		
Yes	11	8,7
No	115	91,3
Hypoxia		
Yes	16	12,7
No	110	87,3
Septicemia		
Yes	16	12,7
No	110	87,3
Hypoglycemia		
Yes	2	1,6
No	124	98,4
Pneumothorax		
Yes	3	2,4
No	123	97,6
Septic shock		
Yes	35	27,8
No	91	72,2
Cardiogenic shock		
Yes	17	13,5
No	109	86,5
H+ (acidosis)		
Yes	8	6,3
No	118	93,7
Hypovolemia		
Yes	5	4,0
No	121	96,0
Pulmonary Thromboembolism		
Yes	1	0,8
No	125	99,2
Neurogenic Shock		
Yes	1	0,8
No	125	99,2

Variables	n	%
Ignored		
Yes	23	18,3
No	103	81,7
Pre-Cardiopulmonary arrest Events		
Chest Pain		
Yes	12	9,5
No	114	90,5
Vomiting in jets		
Yes	5	4,0
No	121	96,0
Acute pulmonary edema		
Yes	11	8,7
No	115	91,3
Bronchial aspiration		
Yes	8	6,3
No	118	93,7
Cyanosis		
Yes	9	7,1
No	117	92,9
Desaturation		
Yes	9	7,1
No	117	92,9
Hypotension		
Yes	13	10,3
No	113	89,7
Upper Gastrointestinal Bleeding		
Yes	7	5,6
No	119	94,4
Lung Diseases		
Yes	25	19,8
No	101	80,2
Tachycardia		
Yes	3	2,4
No	123	97,6
Cardiovascular Diseases		
Yes	7	5,6
No	119	94,4
Breathing in Gasping		
Yes	4	3,2
No	122	96,8

Variables	n	%
Diarrhea		
Yes	5	4,0
No	121	96,0
Bradycardia		
Yes	5	4,0
No	121	96,0
Other		
Yes	6	4,8
No	120	95,2
Ignored		
Yes	40	31,7
No	86	68,3
Heart Rate		
Ventricular fibrillation	1	0,8
Ventricular fibrillation + asystole	1	0,8
Ventricular tachycardia	1	0,8
Ventricular tachycardia + pulseless electrical activity	1	0,8
Ventricular tachycardia + pulseless electrical activity + asystole	1	0,8
Ventricular tachycardia + asystole	3	2,4
Pulseless electrical activity	2	1,6
Pulseless electrical activity + asystole	4	3,2
Asystole	34	27,0
Ignored	78	61,8
Conduct		
Automated External Defibrillator		
Yes	12	9,5
No	114	90,5
Cardiopulmonary Resuscitation		
Yes	113	89,7
No	13	10,3
Use of Medications		
Yes	81	64,3
No	45	35,7
Airway access		
Yes	70	55,6
No	56	44,4

Variables	n	%
Maneuver not performed/ignored		
Yes	13	10,3
No	113	89,7
Medicines used		
Ignored	69	54,8
Adrenaline	27	21,4
Adrenaline + Sodium Bicarbonate	5	4,0
Norepinephrine	3	2,4
Other	22	17,4
Outcome		
Transfer	1	0,8
Death	125	99,2

The distribution of data on the causes of CPA and pre-CPA events indicates that the most prevalent causes are septic shock (n = 35; 27.8%), cardiogenic shock (n = 17; 13.5%), hypoxia (n = 16; 12.7%), and sepsis (n = 16; 12.7%). Regarding pre-cardiac arrest events, pulmonary diseases were the most frequent (n = 25; 19.8%), followed by hypotension (n = 13; 10.3%) and chest pain (n = 12; 9.5%).

Regarding heart rhythm, the records indicate that 34 patients (27.0%) had asystole. In others (n = 4; 3.2%), pulseless electrical activity and asystole were observed. In three cases (2.4%), ventricular tachycardia was observed in association with asystole. Regarding cardiopulmonary resuscitation procedures, the most common were chest compressions (n = 113; 89.7%), use of medications (n = 81; 64.3%), and securing airways (n = 70; 55.6%). Of the medications used, 21.4% used adrenaline. The data show that 99.2% (n=125) of the patients died.

Table 4 – Distribution of data related to the association between the use of medications in the CPA, sociodemographic and clinical variables of the sample. João Pessoa, PB, Brazil 2024

Variables	Use of medications in Cardiopulmonary arrest		p-valor
	Yes n (%)	No n (%)	
Sex			
Female	37 (64,9)	20 (35,1)	0,894*
Male	44 (63,8)	25 (36,2)	
Age			
18 to 20 years old	1 (100,0)	0 (0,0)	
21 to 30 years old	2 (66,7)	1 (33,3)	
31 to 40 years old	4 (100,0)	0 (0,0)	0,703**

Variables	Use of medications in Cardiopulmonary arrest		p-valor
	Yes n (%)	No n (%)	
41 to 50 years old	5 (62,5)	3 (37,5)	
51 or older	69 (62,7)	41 (37,3)	
Comorbidities			
Systemic arterial hypertension			
Yes	42 (65,6)	22 (34,4)	0,750*
No	39 (62,9)	23 (37,1)	
Diabetes Mellitus			
Yes	35 (74,5)	12 (25,5)	0,066*
No	46 (58,2)	33 (41,8)	
Coronary Artery Disease			
Yes	0 (0,0)	2 (100,0)	0,126**
No	81 (65,3)	43 (34,7)	
Chronic kidney disease			
Yes	3 (75,0)	1 (25,0)	0,550**
No	78 (63,9)	44 (36,1)	
Chronic Obstructive Pulmonary Disease			
Yes	3 (75,0)	1 (25,0)	0,550**
No	78 (63,9)	44 (36,1)	
Cancer			
Yes	3 (42,9)	4 (57,1)	0,247**
No	78 (65,5)	41 (34,5)	
Alzheimer's			
Yes	4 (50,0)	4 (50,0)	0,455**
No	77 (65,3)	41 (34,7)	
Heart Failure			
Yes	4 (57,1)	3 (42,9)	0,485**
No	77 (64,7)	42 (35,3)	
Conduct			
Automated External Defibrillator			
Yes	11 (91,7)	1 (8,3)	0,055**
No	70 (61,4)	44 (38,6)	
Cardiopulmonary resuscitation			
Yes	81 (71,7)	32 (28,3)	**<0,001****
No	0 (0,0)	13 (100,0)	

Variables	Use of medications in Cardiopulmonary arrest		p-valor
	Yes n (%)	No n (%)	
Airway Access			
Yes	65 (92,9)	5 (7,1)	**<0,001***
No	16 (28,6)	40 (71,4)	

Note: * Pearson's Chi-square test; **Fisher's Exact Test.

By associating medications with sociodemographic and clinical data, we were able to understand the need for their use during CPA. This allowed us to identify a statistically significant association between medication use with the conduct to perform CPR during CPA (p-value < 0.001) and accessing the airways (p-value < 0.001), indicating the prevalence of medication use in patients undergoing CPA subjected to such conduct.

DISCUSSION

When analyzing the research data regarding the sociodemographic characteristics of the participants, a prevalence of cardiopulmonary arrest (CPA) was observed among individuals over 51 years of age who were predominantly male, of brown complexion, and of married or stable union marital status. These individuals had an incomplete elementary education, which is consistent with the profile of patients found in a cohort study held in Campo Grande, Brazil.[8]

The mean age of male patients in this study was 64.33 years. The most prevalent comorbidities were systemic arterial hypertension and diabetes mellitus, in addition to significant risk factors such as smoking and alcoholism. In this study, a high percentage of patients who received treatment had a non-shockable rhythm.[8]

Regarding the participants' race, brown was the most prevalent. These findings contrast with those of another study in which most patients were Caucasian.[9] A cohort study conducted in Ventura County, California evaluated the association between race/ethnicity and cardiac arrest incidence rates, clinical profiles, and outcomes, revealing that 45.8% of the sample was white.[10]

Regarding clinical variables, the non-shockable rhythm, especially asystole, was found to be the most prevalent among patients in the present study. This result is similar to another study in which a non-shockable rhythm was also the main cause of mortality and associated with worse clinical outcomes.[10] However, this result contradicts a study in Porto Alegre, Brazil, in which shockable rhythms were more prevalent.[11]

This study also observed that hypoxia was a common cause of CPA, consistent with our results.[11] A retrospective and descriptive study conducted in Mexico corroborated our results, finding PEA and asystole rhythms in 85% of cases and highlighting hypoxia as a leading cause.[12]

Regarding pre-cardiac arrest events, lung diseases were identified as the main factor in the present study. This finding is consistent with another study that identified respiratory failure as the primary pre-event of cardiac arrest (CPA).[9] Conversely, another study examined the clinical profiles, triggers, and long-term prognoses of survivors of acute coronary syndrome (ACS) and identified pulseless electrical activity (PEA) in acute myocardial infarction (AMI) as the most prevalent precipitating event.[13]

The sample studied revealed that pulmonary diseases were the most prevalent cause of CPA, followed by hypotension and chest pain. However, a study conducted at a public university hospital in Chile revealed that the most frequent events were cardiovascular, followed by traumatic and respiratory events. These findings underscore the importance of implementing CPA registration initiatives in countries, as this would facilitate the identification of predictors and the development of strategies to improve the clinical outcomes of these patients. Additionally, it would advance research related to cardiopulmonary resuscitation.[14]

A significant association was found between medication use and airway access during CPA, with medication use predominating among those who underwent CPR maneuvers. Regarding the CPR protocol, the use of medications such as epinephrine and amiodarone was frequently recorded. However, neither invasive mechanical ventilation nor the

administration of vasoactive drugs demonstrated a statistically significant association with the survival rate. This finding is supported by a cross-sectional observational study conducted in Goiânia, Goiás, Brazil.[15]

CONCLUSION

The results characterize the epidemiological profile of patients with cardiopulmonary arrest and attest to the influence of certain variables on triggering cardiac arrest in the prehospital context of patients treated at the Emergency Care Unit (UPA) Oceania. These results are essential for advancing scientific evidence because they help identify contributing factors to CPA. This information is fundamental to estimating and improving the prognosis of these individuals and implementing effective prevention and intervention strategies.

One limitation of the study was the difficulty in accessing accurate information from the medical records, which often had incomplete data and gaps. Access to medical records was also hindered by a lack of digitization and organization; the records were only stacked by date, making targeted information searches difficult.

Another significant limitation was the scarcity of literature addressing the relationship between cardiopulmonary arrest and its triggers. This lack of literature makes it difficult to understand the underlying mechanisms and conditions that contribute to these events and formulate evidence-based recommendations.

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