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Original Research Article

Estimation on Prevalence and Factors associated with Cardiovascular Emergencies in SKMCH, Muzaffarpur, Bihar

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Abstract

Background: Worldwide, CVD is the leading cause of death and a major cause of disability and lost productivity in adults. Hence, this study tried to Estimate the prevalence and factors associated cardiovascular emergencies and outcome in SKMCH, Muzaffarpur, Bihar.

Methods: This cross-sectional study was conducted from April 2025 to September 2025 at Emergency department of SKMCH, Muzaffarpur, Bihar. Total 422 patients included with aged 15 years or more except those with uncompleted medical records. Data collected from questionnaire-based interviews with patients and medical files. Data were processed with Epi Info® 7.2.2.6 and MS Excel® 2019. Dependent variable was cardiovascular emergency regardless of the type. A multiple logistic regression model to estimate adjusted odds ratios (95% Confident interval) of the relation between cardiovascular emergencies and patients' characteristics with a statistical significance threshold of p-value <0.05.

Results: Among 422 patients included in our study, 116 had cardiovascular emergencies, prevalence of 27.5%. 68% (79/116) were over 50 years and 50.9% (59) were male. The most common personal medical history was hypertension with 50.8% (59/116). Among the 15 deaths which were recorded, one third was due to stroke, the main cause of CVD emergency (32/116, 32%). Both hypertensive crisis and heart failure concerned 46.5% (54/116) of all emergencies. History of hypertension [6,09 (3,31-11,21), p <0.0001] and age over than 50 (2.34 [1,33 – 4.10], p=0.002) were independently associated with CVD emergencies.

Conclusion: Health promoting strategies targeting adequate management of high blood pressure and positive lifestyle habits in people over 50 years could help in reducing cardiovascular emergencies frequency in hospital settings.

Keywords: Emergency, Prevalence, cardiovascular, odds ratio, risk factors.

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Introduction

Non-communicable diseases are a set of pathologies with common epidemiological characteristics and cardiovascular diseases are the leading cause of disease burden in the world (refer to Roth Ag aet al, 2020, in Kidney int). According to World Health Organization (WHO), 71% of deaths worldwide are related to non-communicable diseases (NCDs), which makes them a major public health issue [1].

Deaths from cardiovascular disease are estimated at 17.7 million, or 31% of total global mortality. Of these deaths 7.4 million are due to coronary heart disease and 6.7 million to stroke (2015) [2]. Main risk factors for coronary heart disease and stroke are poor diet, lack of physical activity, smoking and excessive alcohol use [2]. Many of these cardiovascular conditions occur as emergencies which threaten the patient's immediate life-threatening prognosis. Cardiological emergencies are a set of pathologies such coronary, hemodynamic, rhythmic or of any other origin etc, involving the patient's vital and functional prognosis.

Prevalence of cardiovascular diseases is increasing in sub-saharian Africa (SSA) [3] [4] and they are the second cause of death in Africa according to WHO' estimates. In 2015, nearly 1.2 million people are dead because of cardiovascular disease, which is more than pooled deaths from malaria and tuberculosis [5]. The main pathologies are high blood pressure, strokes, cardiomyopathies and coronary heart disease.

A study suggests high prevalence of arterial hypertension in children and adolescents in Africa, overweight and obesity being an important risk factor [6] . Also, other authors suggest an increasing burden of stroke in Africa [7] .

In Niger, health situation is strongly marked by the predominance of communicable diseases, NCDs are gaining ground. Indeed, according to the "STEPS wise" survey (2007) on risk factors for NCDs and the prevalence of high blood pressure and hyperglycemia, 21.2 % of adults have high blood pressure and 4.3% hyperglycemia. Furthermore, 26.5% of participants were overweight and 4.9% were tobacco smokers [8]. Since then, no national study has been carried out. With a view to curbing the increase in these pathologies, the National Program for Fight against NCDs was created in 2012 and it is leading the design, the implementation and the evaluation of the national policy in fight against NCDs in Niger. Niamey National hospital (NNH) medical emergency receives all medical emergencies and in 2018, about 2,699 cases of cardiovascular emergencies (CVE) were registered.

Aim of this study to estimate the prevalence and to identify risk factors of CVE in patients admitted to the medical emergency department of SKMCH, Muzaffarpur, Bihar.

Material and Methods

This was a descriptive and analytical cross-sectional study was conducted from April 2025 to September 2025. The population consisted of all patients aged 15 years and over, admitted to medical emergency department of Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar.

The sample size was calculated considering a proportion of 50%, a precision d of 5% with a statistical power of 80%. Overall, 422 patients were included in the study. Identified all patients aged 15 and over, admitted for a cardiovascular emergency or not, during our study period until reaching our sample size.

Study was conducted a face-to-face interview with patient or his companions if he is not able to respond. A documentary review was also used based on the medical file or patient file in order to complete information on the management. We used a semi-structured questionnaire. These tools were used after sensitizing and obtaining informed consent from patients, in order to collect patient information. We used also medical emergency hospitalization register to identify admitted patients as well as individual medical records to assess information from the preliminary medical examination. we collected sociodemographic (age, sex, occupation, Physical activity, type of physical activity, lifestyle, Socioeconomic factors, Psychological and socio-cultural factors, Place of residence, Marital status, Type of household, Monthly income) and clinical data (Known cardiovascular risk factors, Blood pressure on admission, Height, Weight, body mass index (BMI) abdominal perimeter, Glasgow scale, Diagnosis retained, Outcome).

Dependent variable was cardiovascular emergency and independent variables were socio-demographic factors, clinical and paraclinical characteristics, lifestyle, psychological and socio-cultural factors, as well as management. Anthropometric parameters (weight, height, waist circumference) and blood pressure were also measured. With Epi Info® version 7.2.2.6 and the Excel® version 2019 software's, we estimated frequencies, proportions, means and made comparisons (chi-square tests of Pearson or Student), crude and adjusted odds ratios (OR) with their confidence interval of 95%. The significance level was a p-value <0.05 for all our analyses. We selected variables to be included in the multiple logistic regression model by considering the associations between explanatory variables and the dependent variable with a p-value ≤ 0.20. Also, we included other variables in the model based on data from scientific literature on the role of these factors in cardiovascular emergencies. We used a top-down walkthrough to identify independently associated factors.

Results

Among 422 patients included in our study, 116 had cardiovascular emergencies, prevalence of 27.5%) The most frequent cardiovascular emergencies were stroke, hypertensive crisis, and global heart failure respectively 32% (37), 28% (33), and 18% (21).

Among the 15 deaths recorded, 33.3% (5) were due to ischemic stroke.

The mean age was 57.7 (16.7) with extremes of 15 and 90 years. Sixty-eight percent (79) of patients were over 50 years old and approximately half 50.9% (59) were male. Among patients with CVE, 57,7 % (67) did not practice any physical activity, 16.3% (54) were obese and 40.6% (43) had a waist circumference over gender-related standards (for men, a waist circumference $\geq$ 102 cm and for women a waist circumference $\geq$ 88 cm). We noted

29.3% (123) had blood pressure ≥ 140/90 mm Hg. The most common medical history was hypertension (50.8% (59)).

Table 1: Comparison of patient data according to cardiovascular emergencies status

Data	CVE* (n=116) %(n)	No CVE (n=306) %(n)	p-value
Age, years			$<10^{-4}$
<50	32(37)	56(172)	
≥50	68(79)	44(134)	
Sex			0.38
Male	51(59)	55.6(170)	
Female	49(57)	44.4(136)	
Personal history of hypertension			$<10^{-4}$
No	49(57)	86(262)	
Yes	51(59)	14(44)	
Body mass index, kg/m²			0.7
<30	86(100)	87.58(268)	
≥30	14(16)	12.41(38)	
Practice of aphysical activity			0.01
No	58(67)	70(214)	
Yes	42(49)	30(92)	
Daily time spent sitting			0.13
<6h	45(52)	53(162)	
≥6h	55(64)	47(144)	
Waist circumference†, n=312			0.02
≤standard/sex	59.4(63)	72(148)	
>standard/sex	40.6(43)	28(58)	
Smoking			0.19
No	93(108)	89(272)	
Yes	7(8)	11(34)	
Spouse smoking, n= 298			$<10^{-4}$
No	96(111)	99(296)	
Yes	4(5)	1(2)	
Diabetes			0.13
No	94(109)	89(273)	
Yes	6(7)	11(33)	

***CVE: Cardiovascular emergencies; †Waist circumference: for men, we considered a threshold below the standards as a waist circumference of <102 cm and < 88 for women cm.**

In our study, having a history of hypertension, (p <10 -4) as well as age over 50 (0.002), were independently associated with a cardiovascular emergency.

Table 2: Crude and adjusted associations between patients' characteristics and cardiovascular emergencies in the 422 participants

Characteristics	Crude OR [95%CI]		Adjusted, OR [95% CI]	p-value
Age, years				
<50	1		1	
≥50	2.74[1.74-4.30]	$<10^{-4}$	2.34[1.33-4.10]	0.002
Personal history of hypertension				
No	1		1	
Yes	6.30[3.87-10.25]	$<10^{-4}$	6.09[3.31-11.21]	$<10^{-4}$
Body mass index, kg/m²				
<30	1			
≥30	1.12[0.60-2.11]	0.7		
Sex				
Male	1			
Female	0.82[0.53-1.27]	0.38		
Physical activity practice				
No	1			

Yes	1.70[1.09-2.64]	0.01		
Daily time spent sitting				
≤6h	1		1	
>6h	1.38[0.90-2.12]	0.13	1.56[0.89-2.73]	0.11
Waist circumference†, n=312				
≤standard/sex	1		1	
>standard/sex	1.74[1.06-2.84]	0.02	1.51[0.86-2.67]	0.14
Use of oral contraceptives				
No	1			
Yes	0.55[0.20-1.49]	0.23		
Smoking				
No	1			
Yes	0.59[0.26-1.32]	0.19		
Spouse smoking, n=298				
No	1			
Yes	6.66[1.27-34.86]	$<10^{-4}$		
Diabetes				
No	1			
Yes	0.53[0.22-1.23]	0.13	0.27[0.09-0.76]	0.01

Discussion

We found a prevalence of cardiovascular emergencies of 27.5%. This estimate is higher than that found in the Teaching hospital Gabriel Touré (1.2%) by Diop et al. in Mali [9], and in hospitals in North Cameroon (9.9%) by Olivier Pancha et al. [10]. In one hand, their emergency departments even received surgical emergencies, and the sampling was also exhaustive during a year. On the other hand, it is lower than the prevalence reported by Mboliasa et al. in Kinshasa which was 32.5% [11]. This latest study was carried out in an intensive care unit, which has only 8 beds, and expected to admit more life-threatening pathologies, rather than uncomplicated infectious ones. Doing so, that could overestimate the magnitude of cardiovascular emergencies.

All these figures confirm the data of WHO which noted a clear progression of cardiovascular diseases in the world, this due to the epidemiological transition and the insufficiency or lack of preventive measures. In our study, the most common cardiovascular emergencies were: stroke: 37 patients (32%), hypertensive flare: 33 patients (28%) and heart failure: 21 patients (18%). The importance of these three (3) pathologies is consistent with Sub-Saharan statistics on their distribution. Indeed, Bernard et al. [3], estimated them to be 32.2% for severe hypertension, 27.5% for heart failure and 20.3% for stroke.

In developing countries, the most affected population is mostly young adults [3,12]. Unlike in developed countries where cardiovascular emergencies are more frequently described in the elderly [13]. The hypothesis would be that in women, oestrogen has a protective effect until menopause [14]. Age is a known risk factor that gradually increases the incidence of complications from aortic, coronary and then carotid atheroma and heart failure. This risk becomes significant from the age of 50 for men and 60 for women [15]. Surprisingly, diabetes appears to be protective factor in the onset of a cardiovascular emergency in this study. We hypothesize it may be due to the fact that these patients are generally well followed and therefore enough aware of the potential complications of their disease.

They could also benefit regularly from advice on healthy living, and it is not excluded that their drug treatment confers this protection regarding cardiovascular emergencies. They will usually go for causes other than a cardiovascular emergency. There is a compelling case for the beneficial effects of therapeutic lifestyle modification on the prevalence of cardiovascular complications in type 2 diabetes [16]. Nevertheless, we believe that these results require confirmation by a larger study with a more appropriate study design such as a case-control study or a hospital cohort study. Hypertension is the most frequent personal medical history because it was found in 50.8% of patients, which is in line with reports from other studies [3,9].

Conclusion

Prevalence of cardiovascular emergencies was 27.5%. The most frequent cardiovascular emergencies were stroke, hypertensive surge, and, heart failure with respectively 32%, 28%, and 18% with a third of recorded deaths, associated with stroke ischemic. Cardiovascular emergency prevention strategies that target people aged ≥ 50 years, those with a history of hypertension, may help reduce the frequency of cardiovascular emergencies.

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