Original article

Epidemiology of Emergencies in a Hospital in Sub-Saharan Africa

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Abstract

Objective: Assess the epidemiology of emergencies received in the emergency care unit of "Peace Hospital" of Ziguinchor. *Material and methods:* It was a prospective, descriptive and analytic study in the emergency care unit of "Peace Hospital" during the period from the April 01, 2017 to May 31, 2017. *Results:* During the study period, 762 patients were collected. The mean age of patients was 35.1 years with extremes of 1 month and 91 years. The patients were mostly in the 20-39 years old range. The female sex was predominant at 55.6%. Most of our patients came from the Ziguinchor department with a proportion of 82.3%. The majority of patients or 92.7% arrived at the emergency care unit by taxi or private vehicle. Among the patients transferred by ambulance, 41.5% had been subject to effective regulation. The majority of patients (45.3%), had a length of stay of less than one hour. The predominant pathologies were digestive pathologies in 20.3%, followed by respiratory pathologies in 14.8%. The return home was effective in 80.7% of patients. The overall mortality rate was 5.6%. The factors of severity were the age $\geq$ 60 years, serious pathologies, non-medicalization of ambulances, late referral, the long-term length of hospitalization in the emergency care unit. *Conclusion:* Emergency care units often face difficulties with human resources and material.

Keywords: Epidemiology, Emergency, Sub-Saharan Africa, Ziguinchor

Introduction

Emergency management has always been a challenge in medicine. Health facilities have always faced situations where the patient needs optimal care as soon as possible. Since ancient times, acting quickly and effectively has been the priesthood of physicians and caregivers who are on the field. Industrialization in the 19th century, the more devastating aspect of inter-human conflicts and the emergence of epidemics have made emergency pathologies a major public health problem [1]. In Africa, the lack of adequate infrastructure, medical equipment and organization is a brake on the expansion of emergency medicine. Senegal, in particular the Ziguinchor region, does not seem to escape this rule. It is in this context, that the ministry of health has developed emergency care protocols for health workers at all levels of the health pyramid. Emergency pathologies are common in regions where their management sometimes collides with the inadequate technical equipment. Raising the technical equipment in region is a major concern in order to expect to meet the demand of increasingly demanding populations when facing a medical emergency. The Peace Hospital of Ziguinchor, one of the reference hospitals of the southern part of the country, is facing technical equipment deficiencies. The objective of this work was to assess the epidemiology of received emergencies in the emergency care unit of the Peace Hospital of Ziguinchor.

Materials and methods

Type and context of the study

Our study was led in the emergency care unit of the Peace Hospital of Ziguinchor. The department of Ziguinchor is limited to the north by the department of Bignona, to the east by the region of Sedhiou, to the west by the department of Oussouye and to the south by the Republic of Guinea Bissau. The Peace Hospital of Ziguinchor covers the regions of Ziguinchor, Sedhiou, Kolda and neighbouring countries such as Gambia, Guinea Bissau and Guinea Conakry. The emergency care unit has 14 beds and a resuscitation room. It is equipped with air, oxygen and vacuum wall outlets for short-term hospitalization and does not have an operating room.

Resuscitation department is remote from the emergency care unit located at the entrance of the hospital allowing easy access for the patients. All specialties are represented in the Peace Hospital except: neurology, neurosurgery, trauma and psychiatry. It was a prospective, descriptive and analytic study conducted from April 01, 2017 to May 31, 2017.

Study population

It consisted of all patients received in the emergency care unit during this study period. Data were collected from consultation, hospitalization and patients records. For each patient, an investigation form was made comprising: age, sex, origin, means of transport (ambulance, taxi, private vehicle, motorcycle), regulation, diagnosis, evolution, date and time of entry and exit.

Word processing was performed with Microsoft WORD 2010 software, data analysis with EPI Info Version 7 software, diagrams and tables with Microsoft Office EXCEL 2007 software. The statistical tests used were Khi2 and Student. They were significant for values of $p < 0.05$ (5%).

Results

During the study period, 762 patients were received at the Peace Hospital emergency care unit. The mean age of patients was 35.1 years with a standard deviation of 22.4 and extremes of one month and 91 years. The mode and median were respectively of 25 and 31 years. The most common age group was 20 to 39 years. Figure 1 shows the age distribution.
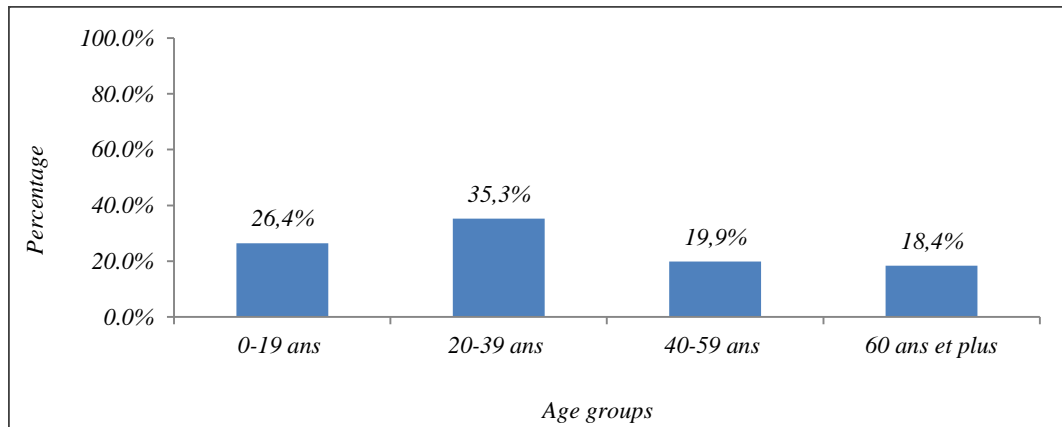
Figure 1: Repartition of patients according to age groups

The female sex was predominant with a rate of 55.6% and a sex-ratio of 0.80. Most of the patients came from the Ziguinchor department or 82.3%. Table I shows the distribution of patients by location.

Table I: Distribution of patients according to their location

Location	Number	Percentage (%)
Ziguinchor	627	82,3
Sedhiou	53	7,0
Bignona	46	6,0
Bissau Guinea	21	2,8
Oussouye	13	1,7
Gambia	1	0,1
Kolda	1	0,1
Total	762	100

More than 88.6% of patients came by taxi. All transport by ambulance or 7% was non-medical and the ambulances were those of the health districts and health peripheral facilities. The other means of transport were either a private car or a motorcycle. Only 22 patients had been effectively regulated. The regulation was carried out via the mobile phone numbers dedicated to the emergency care unit. During the nights, 378 patients, or 50.8%, were admitted to the emergency care unit compared to 375 patients, or 49.2% during the days. The predominant pathologies were represented by digestive pathologies in 20.3% of patients followed by respiratory pathologies in 14.8%. (Table II).

Table II: Distribution of patients by pathologies

	Number (n)	Percentage (%)
Digestive	155	20,3
Respiratory	113	14,8
Traumatological	104	13,6
Neurovascular	96	12,6
Cardiac	75	9,8
Infectious	48	6,3
Genitourinary	41	5,4
Gyneco-obstetrics	30	3,9
Diabetes and complications	27	3,5
Neuropsychiatric	13	1,7
Surgical	9	1,2
Others	51	6,7
Total	762	100

These were mainly gastroenteritis and asthma attacks.

Table III shows the distribution of the most frequent pathologies.

Table III: Distribution of the most frequent pathologies

	Pathologies
Digestive	Gastroenteritis, peptic ulcer, colitis
Respiratory	Asthma attack, bronchiolitis, pneumonia
Traumatological	Dermabrasion, wound
Neurovascular	Stroke, epileptic seizures
Cardiac	Cardiomyopathy, pulmonary edema, cardiovaxcular schock
Infectious	Meningoencephalitis, dermohypodermitis, febrile coma, intermittent fever
Genitourinary	Acute urinary retention, cystitis, pyelonephritis
Gynecoobstétrics	Dysmenorrhea, ectopic pregnancy
Diabetes and complications	Ketoacidosis, diabetic foot
Neuropsychiatrics	Delirious episode, hysteria
Surgical	Appendicitis, acute intestinal obstruction, peritonitis

The majority of patients, 45.3%, had a length of stay of less than one hour. 80.7% of patients returned home. The mortality rate was 5.6%. The pathologies in which the deaths occurred are shown in Table IV.

Table IV: Distribution of deaths by pathologies

Pathologies	Number of cases	Number or deaths	Percentage of deaths
Stroke	*26*	*24*	*55,81%*
Opportunic infections in HIV	*8*	*6*	*13,95%*
Febrile coma	*6*	*4*	*9,3%*
Chronic heart failure	*4*	*2*	*4,65%*
Chronic renal failure	*1*	*1*	*2,33%*
Myocardial infarction	*2*	*1*	*2,33%*
Pulmonary embolism	*1*	*1*	*2,33%*
Severe head trauma	*1*	*1*	*2,33%*
Malignant staphylococcal infection of the face	*2*	*1*	*2,33%*
Cholangiocarcinoma	*1*	*1*	*2,33%*
Decompensated cirrhosis	*3*	*1*	*2,33%*

At the end of our study, the data analysis allowed us to highlight several factors of gravity:

Age ≥ 60 years,

Serious pathologies

The non-medicalization of ambulances

Long-term hospitalization in emergency care unit

Discussion

In Senegal, and in particular in Ziguinchor, emergency management poses diverse challenges which are related to the general state of poverty in the region and inadequate organization of the health system. Difficulties are also related to the nature and volume of emergencies, particularly in cities. The means of transport mostly used to attend the emergency care unit were taxis and private vehicles. This could be explained by the lack of emergency medical services (EMS) in the region. Thus, it's not uncommon to see very serious patients arriving at the emergency care unit by private vehicles. These patients die most often during transportation or within an hour of admission. In addition, there is a lack of medical regulation despite the existence of an emergency number known to all district physicians and most health stations, which contributes to increased emergency wait times. Only 53 patients or 7% had come by ambulance to the emergency care unit. Regulation was effective in only 22 of these patients. This could be explained by the lack of toll-free emergency numbers, lack of reference procedures, lack of EMS in the region. We noted that 45.3% of patients had stayed less than an hour at the emergency care unit. The length of stay was between one hour and 24 hours for 40.7%. It was over 24 hours for 14%. These results show that almost half of patients most often consult for benign pathologies requiring ambulatory treatment. In addition, patients seen in consultation and hospitalized for less than 24 hours presented most often acute illnesses. It should be noted that this group concerns patients for whom the evaluation at the reception suggests that after a prolonged period of care but less than 24 hours, the progression will be satisfactory allowing a return home. The concerned pathologies included trauma, allergic reactions, moderate asthma, dehydration, malaria access and uncomplicated infections[2;3].

Patients with a hospitalization of more than 24 hours were those with a serious pathology or requiring specialist advice or who had a previous hospitalization[4]. Among patients admitted to the emergency care unit during our study period, we had an overall hospitalization rate of 14%. Among these, there was 80.7% of return home, 13.6% of patients transferred to the services and 5.6% of deaths. The overall hospitalization rate in our study was slightly low and could be explained by the multidisciplinary management but also by the transfer of the majority of our patients to other departments. A higher rate is found in a study of research, evaluation and statistics studies directorate[5] and could be explained by a greater capacity for emergencies receipt. The death rate in our study population was 5.6%, low compared to the Zoumenou study[6] which found a death rate of 11.30%; this rate is slightly higher than the one reported in the Velomora study[7] which found a rate of 4.4%. This rate could be explained by death-related factors such as age ≥ 60 years, serious pathologies, non-medical ambulances, late referral, length of hospitalization of emergency patients with the risk of nosocomial infections. The lack of means of care upstream of emergencies and the difficulties of orientation downstream are among other factors of mortality. According to the WHO, 15 thousand deaths/year are recorded in the emergency departments. Zoumenou[6] had identified as factors related to death, the severity of the pathologies and their delayed transfer to the emergency units. Patients over 60 years of age have several health defects and are sometimes admitted for palliative care. Long periods of hospitalization at the emergency care unit are related to the lack of neurology department for stroke, lack of rooms in hospitalization unit for medical pathologies and resuscitation.

Despite the policy of the Ministry of Health to provide health facilities with medicalized ambulances, all transferred patients were received without medical assistance. The organizational effort should also concern the staff, in terms of its distribution and especially training.

Conclusion

The example of Ziguinchor is quite illustrative of the situation prevailing in underdeveloped tropical countries. In tropical environment, the pathologies encountered in emergency are very varied and often severe. The emergency physician, in this context of work, is confronted mainly with difficulties related to resuscitation in the frame of the emergency but also with the absence of some specialists. There is a need for a resuscitation service to adequately sort "real emergencies" from non-emergency cases and ensure a continuum of care. Unfortunately, our structures are often confronted with the problems of insufficient qualified personnel, equipment and financial resources.

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