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Challenges in Emergency Medical Services in a Resource-Limited Setting in Sub-Sahara Africa; Perspectives from Cameroon: a Review Article

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ABSTRACT

Emergency medical services with pre-hospital care remain poorly developed in sub-Saharan Africa and the developing world at large. The provision of timely treatment during life-threatening emergencies is not a priority for many health systems in developing countries. In this review, the authors reviewed the evidence indicating the need to develop and/or strengthen emergency medical care systems in sub-Sahara Africa with perspectives drawn from Cameroon.

Keywords: Emergency medical service, prehospital care, Cameroon, sub-Sahara Africa

1. INTRODUCTION

Emergency medical services (EMS) are a community's' gateway to acute and emergency medical care for members of the public facing time-sensitive critical illnesses and injuries[(1,2)]. Africa shares a disproportionately high burden of the world's morbidity and mortality[(3)]. The Disease Control Priorities project estimates that up to 36% of disability and 45% of mortality could be averted by effective EMS systems[(1,3)]. Such systems function on a continuum, in which access and care occur in an uninterrupted, coordinated sequence (fig. 1)[(1)]. The first four phases occur out of hospital setting during pre-hospital care[(3)]. Improved health outcomes may be achieved by strengthening each individual phase of care, and integrating all phases[(1)].

Contrary to low and middle income countries (LMICs), most high income countries have an established emergency medical systems[(4)]. EMS systems, regardless of their state of development, play a critical role in the continuum of ensuing medical care[(1,5)]. Emergency care usually begins in the community, when someone identifies a perceived emergency condition and attempts activation of the local EMS system. This ideally triggers a cascade of events resulting in a timely response of expertise, resources, and service directed to patient stabilization and/or safe emergency patient transportation to the nearest appropriate facility[(1,6,7)].

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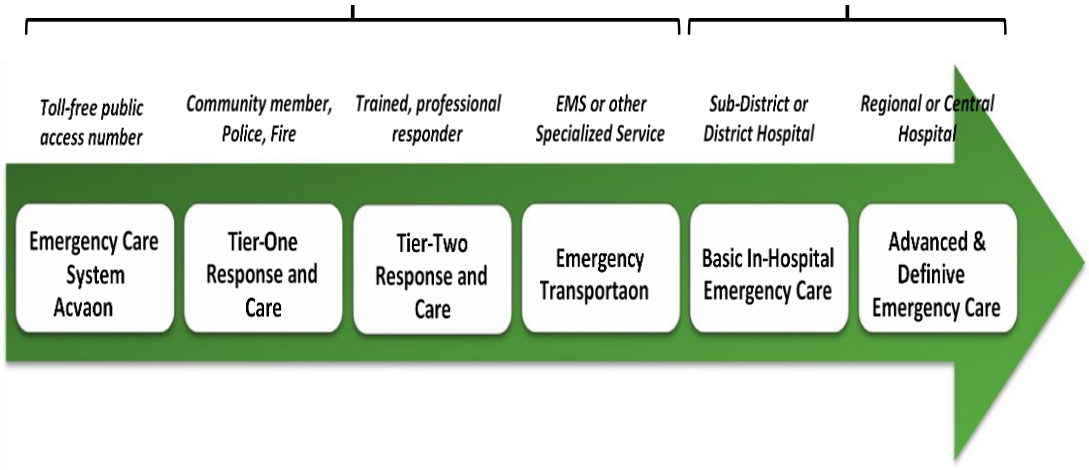

Figure 1: Flow chart showing the EMS with prehospital care

The development of emergency medicine (EM) as a specialty began in 1961 when four physicians led by James D. Mills M.D. left their private medical practices to staff an emergency department (ED) together in Alexandria, Virginia. Meanwhile, a similar effort by 23 physicians occurred in Pontiac, Michigan, leading to the "Pontiac and Alexandria Plans" for emergency medicine[4,8,9]. This reflected the efforts of pioneering physicians around the world who independently realized the need for a specialist in emergencies who would be available to patients at all times or day or night. These physicians lit the flame of the modern specialty of emergency medicine so that the world could benefit from its light[10]. While attempts to provide emergency care are arguably as old as medicine, emergency medicine is relatively a young specialty about fifty years old having been officially recognized in both Europe and USA only in the latter half of the twentieth century[9,11]. The modern history of emergency medicine essentially began in the early 1960s. Before 1960, there was no emergency medicine as a defined academic specialty. Typical hospital emergency rooms staffing patterns used resident and other hospital staff physicians, or rotating on-call duty of all specialties, general practitioners[9].

A recent survey published in 2017 showed that EMS systems exist in only one-third of African countries. Injury and obstetric complaints are the leading African pre-hospital conditions and only a minority (<9.0%) of Africans have coverage by an EMS system. Most EMS systems were predominantly basic life support, government operated, and involved a fee[12,13]. Furthermore, a recent study in Yaoundé Cameroon showed a very high unmet need of EMS, in this survey 68.8% of respondents reported unmet needs for emergency care[14].

Before the establishment of emergency medicine in the Africa, emergencies that needed a specific specialist not in attendance were given to whatever physician could be found, regardless of expertise. Often this was a very junior doctor in training. The problems with this approach were twofold. First, even the largest hospitals all specialists may not be valuable in the light of a typical day, but without the specialty of emergency medicine it is rarely possible to provide specialist care at 3 a.m. or on a holiday. Second, and more fundamental, is that atypical presentations of disease often make it unclear which specialist the patient needs in a timely manner. In the absence of an emergency medical physician, each would require a different specialist, and the time it took to determine which one could be harmful or fatal to the patient[13,15].

The purpose of this manuscript is to report on the state of EMS in a resource limited setting in sub-Sahara Africa with perspectives from Cameroon.

2. METHODS

Study design and setting

This is a narrative review of the state of EMS in sub-Sahara Africa with perspectives from Cameroon. The review was carried out between March 2017 and August 2017.

The Republic of Cameroon is a LMIC located in Central Africa. Cameroon has an estimated population of 22.7 million with life expectancy of 55 years and median age of 18 years in 2014. Population growth rate is 2.6% and birth rate is 36.6 births per 1000 population. Gross national income per capita around $1360 using the Atlas method ($2400, purchasing

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power parity) and literacy rate is 75% [16]. Health expenditures are 4.1% of gross domestic product (GDP) and immunisation coverage rates among 1-year olds were 80–90%. Age-standardised mortality rates by communicable, non-communicable and injuries are 769, 675 and 106 per 100 000 population, respectively, and HIV/AIDS prevalence rate is 4.5%[17,18].

Search methods

Little information is available on health systems in Cameroon. An extensive review of the literature was done using online sources, PUBMED, Google scholar, USAID and WHO. Search terms included, "Cameroon", "sub-Sahara Africa and health", "war", "epidemics", "emergency medicine", "salle des urgences", "medical education", and "African medical education".

3. DEVELOPMENT OF EMS IN CAMEROON

The current health care system in Cameroon

Cameroon is a central African country with a population of approximately 22 million people and two official languages, English and French. The country is divided into ten regions, which are further divided as divisions and sub-divisions. The health sector in Cameroon includes private and public health sectors. There are 5 referral hospitals and one emergency centre. Health care structures in Cameroon are divided into five categories as follows:

- First category hospitals: These include reference hospitals and similar structures. There are currently six referral hospitals in Cameroon for example Douala and Yaoundé General Hospitals
- Second category hospitals: These include central hospitals and similar structures example Yaoundé Central Hospital, Yaoundé emergency centre (YEC), etc.
- Third category hospitals: These include regional hospitals and similar structures
- Fourth category hospitals: These include district hospitals
- Fifth category hospitals: These include sub-divisional hospitals (SDHs)

The country uses the fee-for-service model to pay for medical care, and patients are required to supply necessary medications and supplies to the hospital after direct purchase in pharmacies. Health insurance programmes are poorly structured, and between 2010 and 2014, 94.2% of private expenditure on health was out-of-pocket expenditure[16]. The WHO estimates the density of physicians and nurses as 0.8 and 4.4 per 10000 population, respectively[17]. Medical and nursing students graduate with little specialty training in emergency care due to lack of comprehensive curriculum in emergency medicine, which leaves emergency care providers difficult to evaluate and manage a broad spectrum of emergency conditions[17]. Unfortunately, the current healthcare system does not meet the increasing needs of the public in Cameroon. Public spending on health was only 2% of GDP in 2012. Growing numbers of road traffic accidents and inadequate pre-hospital transportation systems, coupled with the limited number of trained hospital staff and appropriate equipment, can help explain the rising number of deaths from emergency situations[16,17]. This is not limited to medical emergencies as the country is currently equally facing the problem of rising maternal and perinatal mortality due to lack of emergency obstetrics and neonatal care (EONC) kits[19]. This is evident from the fact that maternal mortality, stillbirth rate and neonatal mortality as well as associated factors remains high[20,21].

EMS in Cameroon

Sadly, Cameroon is a typical example of a developing African country with an underdeveloped prehospital system. The well-known "golden hour" of trauma specifies that patient outcomes are improved when patients are transported to a designated trauma centre within 60 minutes of injury. In Cameroon, the average response time for EMS ranges from 35 minutes in major towns and cities to sometimes no response in the rural interior. This lack of reliability leads citizens to independently transport patients, family members, and friends to nearby health centres without ever calling 119, and may help explain the high degree of morbidity and mortality from pre-hospital emergencies in Cameroon[22].

Prehospital emergency care in Cameroon is basically absent, however in the major towns of Yaoundé and Douala, this service is provided by the French Service d'Aide Médicale Urgente (SAMU) system. The SAMU is a prepaid system; however, usage of SAMU is very limited due to high cost, poor equipment and lack of trained healthcare professionals[14].

The last two years have witnessed some achievements in the field of emergency medicine in Cameroon which include:

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- The inauguration of the Yaoundé Emergency Centre (YEC)
- The signing in 2016 by the minister of public health the consultation and treatment of all vital emergencies in public hospitals within 24 hours of arrival irrespective of their financial status.
- The launching of a specialization in emergency medicine in the YEC for 2017/2018 academic year.

International organizations and foreign countries have also contributed by providing aid to Cameroon's health system in general, and to EDs in particular. One example is the $40 million of equipment recently provided by the US government to YEC[17].

The development of emergency medical student groups throughout the country also reflects a desire for better training of future emergency physicians, for the advancement of the specialty, and for public education and support. As a result, these student groups focus on educating communities in providing basic first aid while calling for new professional training programs and facilities. While much work remains to be done, the rapid expansion of EMS in Cameroon in recent years likely foreshadows a promising future for the specialty and for patient care.

4. CHALLENGES AND RECOMMENDATIONS

There are eight foundational challenges to integrating emergency care into health systems in sub-Saharan Africa and Cameroon:

1. The burden of acute disease in sub-Saharan Africa is severely under-documented: Some data exist on the distribution of inpatient diagnoses in the region, but the actual range of acute presentations to health facilities is largely unknown[23,24,25].
2. Health-care facilities often lack an integrated approach to triage and resuscitation of acutely ill patients: This means acutely ill patients may be cared for by several different departments, depending on age, pregnancy status, and specific disease states. This vertical approach means that there is rarely a dedicated acute intake area staffed with nonrotating personnel who can be trained in resuscitation and stabilization[26].
3. There is no current advocacy plan for placing emergency care on the global health agenda: Despite the essential role of early resuscitation and stabilization in averting morbidity and mortality, emergency care is conspicuously absent from discussions of global health priority initiatives as it was neither present in the Millennium Development Goals nor is it present in the sustainable development goals and other large-scale global health funding strategies[27,28,29,30].
4. Few emergency medical centres: There are very few hospitals equipped in sub-Saharan Africa to handle emergencies. For example in Cameroon there exist only one emergency centre which is the Yaoundé emergency centre and the few reference and regional hospitals that exists are poorly equipped to handle emergencies[22,31].
5. Absence of emergency medicine on the curriculum of medical training: In Cameroon and most African countries, the medical curriculum for the training of general practitioners do not include rotations in emergency medicine. These would be doctors only learn emergency medicine only during calls when there are on rotations in other disciplines such as surgery and internal medicine.
6. Lack of emergency medicine specialization program in most countries: Cameroon as of now has 7 medical schools with one offering various residency programs. As of august 2017, there is no residency program for the training of emergency medical physicians in Cameroon[11,32].
7. Lack of emergency continuous medical education (CMEs) in emergency medicine: Most countries do not have seminars and conferences on emergency medicine. it was only of recent in 2016 that few emergency medical physicians in Cameroon together with anaesthetists and intensive care physicians started their society with yearly conferences previewed[32].
8. Absence of specialized journals and publications in the field of emergency medicine: There are few journals that specializes only on research in Emergency Medicine in sub-Sahara Africa. Furthermore, in Cameroon there is currently no journal that specializes only in the publication of EMS articles and few articles in this field are either published in non-emergency medical journals or are published out of Cameroon[4].

Amidst these problems facing the development of EMS in Cameroon, we recommend the following:

1. Creation of more emergency centres and equipment of already existing emergency departments of all hospitals

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2. Urgent need to start residency training in emergency medicine in the medical schools.
3. Urgent need to start local journals specialized in emergency medicine.
4. Allocation of more funds on research in emergency medicine.
5. Development of the pre-hospital system in Cameroon.

5. CONCLUSION

Little is known about the existence, distribution, and characteristics of Emergency Medical Services (EMS) systems in sub-Saharan Africa, or the corresponding epidemiology of pre-hospital illness and injury. While unmet need for EMS remains high in Cameroon, emergency medicine is underdeveloped and almost non-existent in most LMICs including Cameroon. Emergency is a novel and young specialty which if integrated into the health care system will greatly improve patient care.

DECLARATIONS
The authors declare that they have no competing interest

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