



Ambulance Services of Lagos State, Nigeria: A Six-Year (2001–2006) Audit

Services D'ambulances De L'état De Lagos, Nigeria: Un Audit Sur 6 Ans (2001-2006)

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ABSTRACT

BACKGROUND: Emergency medical care is designed to overcome the factors most commonly implicated in preventable mortality, such as delays in seeking care, access to health facility, and the provision of adequate care at the facility. The developed world has recognized the importance of organized emergency medical services and has well established systems. The Lagos State Government established the first emergency medical system in Nigeria in 2001.

OBJECTIVE: This was to review the activities of the Lagos State Emergency Ambulance Services (LASAMBUS) within the stated period with the hope that our findings can be used to audit the system and make recommendations for further improvement.

SUBJECTS, MATERIALS AND METHODS: We reviewed the records of the State Ministry of Health for the data on the activities of LASAMBUS from 2001–2006. The number and types of emergencies that were seen and managed with the associated morbidity and mortality were reviewed. The constraints that were encountered by the LASAMBUS staff were also studied. The data that was obtained was entered into a proforma designed for the study. Analysis of the data was done using the Microsoft Excel software.

RESULTS: A total of 32,774 cases comprising 21,977(67.1%) males, 10,797(32.9%) females and a male to female (M:F) ratio of 2.04:1, were seen during the study period. Trauma was responsible for 29,500 (90%) of the cases. No mortality was recorded during the transfer of the cases. The records of mortality for the LASAMBUS-transferred cases were not available.

CONCLUSION/RECOMMENDATIONS: Trauma cases formed the majority of the cases that were seen with road traffic accident constituting a large proportion of these. Health education focusing on improving driving etiquette of Drivers and injury prevention should be intensified. More equipped emergency centres should be established to reduce victims transit and injury-intervention time. Record keeping and documentations should be improved for better assessment of the activities. *WAJM 2012; 31(1): 3–7.*

Keywords: Emergency evacuation, Ambulance services, Trauma, Lagos, Nigeria.

RÉSUMÉ

Contexte: La prise en charge médicale d'urgence vise à surmonter les facteurs les plus impliqués dans la mortalité évitable telles que le temps perdu dans la recherche de soins, l'accès aux structures de soins et la disponibilité de soins appropriés dans les structures sanitaires. Les pays développés reconnaissent l'importance de services médicaux d'urgences organisés et ont mis en place des systèmes bien implantés. Le gouvernement de l'état de Lagos a mis en place le premier système médical d'urgences au Nigeria en 2001.

Objectif: Il s'agit de faire la revue des activités des services d'ambulance des urgences de l'état de Lagos (LASAMBUS) dans la période d'étude dans l'idée que nos résultats pourraient être utilisés pour auditer le système et faire des recommandations visant une amélioration du service.

Patients, Matériels et Méthodes: Nous avons revu les données du Ministère de la Santé de l'état de Lagos sur les activités de LASAMBUS de 2001 à 2006. Nous avons revu le nombre et le type des urgences trouvées et prises en charge ainsi que les morbidités et mortalités associées. Les contraintes rencontrées par le LASAMBUS ont également été étudiées. Les données obtenues ont été saisies dans une fiche de recueil de données conçue pour l'étude. L'analyse des données a été faite en utilisant le logiciel Microsoft Excel.

Résultats: Dans la période d'étude, un total de 32.774 cas a été trouvé incluant 21.977 (67.1%) hommes et 10.797(32.9%) femmes avec un sex ratio homme/femme de 2,04:1. Les traumatismes intéressaient 29.500 cas soit 90%. Aucun décès n'a été noté pendant la période d'étude. Les données sur les décès des cas transférés par LASAMBUS n'ont pas été retrouvées.

Conclusion/Recommandations: Les cas de traumatologie représentaient la majorité des cas retrouvés avec une grande proportion d'accidents de la circulation. L'éducation à la santé orientée vers l'amélioration du respect du code de la route et la prévention des traumatismes devraient être renforcées. Des centres d'urgences mieux équipés devraient être mis en place pour réduire le temps de transit des victimes et le temps d'intervention. La conservation des données et de la documentation devrait être améliorée pour une meilleure évaluation des activités. *WAJM 2012; 31(1): 3–7.*

Mots Clés: Évacuation d'Urgence, Services d'Ambulances, Traumatisme, Lagos, Nigeria.

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INTRODUCTION

Emergency medical care is designed to overcome the factors most commonly implicated in preventable mortality, such as delays in seeking care, access to health facility, and the provision of adequate care at the facility.¹

The developed world has long recognized the importance of organized management of trauma patients. Germany established a nationwide trauma system in 1975, ensuring that no patient was more than 15 to 20 minutes from one of these regional centres.²

Styner³ started an organized trauma care training system based on his experiences after a plane crash in Nebraska in 1976. The first Advanced Trauma Life Support Course was held in 1978. This was influenced by the already established Advanced Cardiac Life Support Courses.^{3,4} However policies were not yet made in the developing countries for the management of trauma victims.

The Lagos State Government in response to the total absence of organized state-wide emergency medical management services, set up the Lagos State Emergency Medical Services (LASEMS) in 1998. These were initially made up of two trauma centers and the attached ambulance services. The trauma centres were located at the Emergency Departments (ED) of Lagos State University Teaching Hospital (LASUTH), Ikeja and General Hospital (GH), Lagos. The ambulance services were later separated from the trauma centers, existing as autonomous Lagos State Ambulance Services (LASAMBUS) with the aims of performing effective triage, provide on-site first-aid/emergency medical treatment, and evacuating victims to the designated trauma centers. Six ambulance stations were initially set up along the major highways, and spread evenly across the state.

Presently, there are 18 ambulance stations in the state, each with one ambulance that is manned by a first responder and 2 trained nurses between 8a.m and 6p.m, Monday to Saturday. Radio dependent communication networks inter-link the ambulances, ambulance stations, Emergency Departments (ED), the control rooms and

the principal personnel. The Nigeria Police, Fire Department, Lagos State Transport Management Authority (LASTMA) and Federal Road Safety Corps (FRSC) are also linked on this radio network.

This study aims at a 6-year review of the activities of LASAMBUS from the year 2001 to 2006. The demography and ailments of the cases as well as the limitations of the services were reviewed with the aim of making necessary recommendations to improve the services.

SUBJECTS, MATERIALS AND METHODS

Subjects and Materials

Lagos State is one of the 36 states and the former capital of Nigeria. It is located in the south-western part of Nigeria with both coastal and riverine areas. It is the industrial, commercial and financial capital of Nigeria and West Africa; a mega-city with mixtures of squalor and affluence, shanties and modern housing estates with an estimated human population of 17million occupying a land area of 356,861 hectares⁵.

At the establishment of LASAMBUS, health personnel were trained both in France at an Emergency Ambulance Training School and Israel in emergency medicine. The LASAMBUS model combined the French and Israeli models of ambulance services to evolve a system that incorporates in-hospital and out-of-hospital emergency services. The staff is equipped to manage certain types of emergencies on site without recourse to the hospitals. A retrospective study of the activities of LASAMBUS between 1st January 2001 and 31st December 2006 was carried out. The records documenting the activities of all the ambulances during the study period was retrieved and studied. The details about the types of emergencies and the victims that were involved were also retrieved from the Department of Research and Statistics, Directorate of Hospital Services, Lagos State Ministry of Health and reviewed.

The entries of the ambulance crews were also reviewed in the logbooks and

the difficulties that were encountered while they were performing their duties were recorded. All the entries that were collected constitute the materials for the study.

Permission for the study was sought for and obtained from the Lagos State Ministry of Health and the Research and Ethics Committee of LASUTH.

Methods

The data included:- the demography of all the cases that were involved in the emergency, types of injuries or ailments, on-site first-aid management and the outcome, transit time from the sites of emergency to the designated ED and the clinical condition of the patients on arrival at the ED; whether dead or alive.

Other data that were retrieved from the medical records at the ED included :- the conditions of the cases at the Reception/Triage Room, the definitive diagnosis and subsequent management, outcome of treatment; whether the patient was discharged, transferred to other centers or departments within the same/other hospital, dead or alive. A proforma that was designed for the study was used to collect all the data.

Data Analysis

The data were analyzed using the Microsoft Excel software.

The data were separated into age groups and gender and presented using charts (pie and bar) frequencies and percentages.

Limitations of the study: There were poor documentations involving many aspects of the study.

The Injury-arrival (transit time) and injury-surgical intervention times were not recorded.

The outcome of management of the patients that were taken to the designated medical centers or transferred to other centers were not known.

RESULTS

Demography

A total of 32,774 cases were attended to by LASAMBUS during the study period with an annual average of 5,462 and 15 patients per day. Out of these,

21,977 (67.1%) were male and 10,797 (32.9%) female giving a male to female (M: F) ratio of 2.04: 1. The pattern of presentations during the study period is as shown in Figure 1. Children aged 12 years and below constituted 4% of the total number of patients that were seen. Majority of the patients (91%) were in the adolescent and adult group. Only 1,635 (5%) patients were in the elderly group – Figure 2.

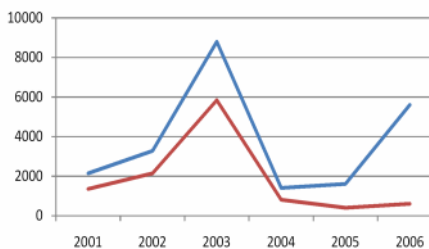


Fig. 1: Gender and pattern of presentation of the cases seen between 2001 and 2006

Aetiology/Causes of Emergencies

The causes and gender distribution of the emergencies were as shown in Figures 3 and 4. Road traffic accidents (RTA) were responsible for the highest number of emergencies (35%). This was followed by the emergencies that were seen during congregations of large crowds (special assignments) (32.2%). Emergencies from gas/bomb explosions and drowning were 8.8% while home accidents were responsible for the least number of calls (0.1%). Trauma from different causes was responsible for 90% of all the cases.

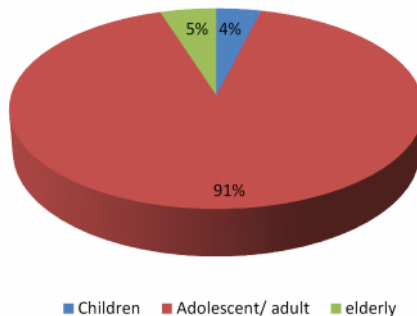


Fig. 2: Distribution of the Emergencies seen among different age group.

The Types and Places of Management of the Cases with the Outcome

A total of 21,303(65%) patients received on-site first-aid treatment and were either discharged or advised to visit the nearest appropriate health institution for follow-up treatment. Out of the remaining 11,471 (35%), 8,521 (26%) were transferred to the designated Emergency Medical Centers for management. A total of 2,950 (9%) were declared dead at the different sites of the emergencies. Two thousand two hundred and ninety four patients (7%) underwent inter-hospital transfer for further management. No patient died during transfers. The records of mortality for those that were transferred by LASAMBUS to the ED/ designated hospitals were not available

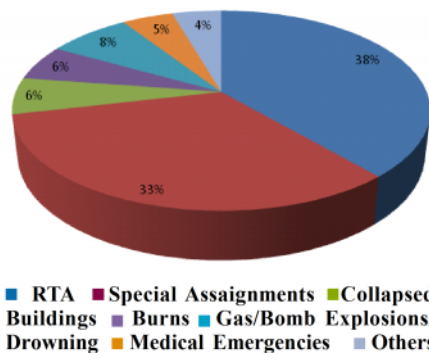


Fig. 3: Distribution of the Aetiology of the Emergencies recorded between 2001–2006

Problems that were encountered by the Ambulance Crews

The problems that were encountered by the LASAMBUS staff during the performance of their duties include: traffic hold-ups, harassment by social miscreants (area-boys), uncooperative attitude of motorists and the long distances between the sites of emergency and the treatment centers.

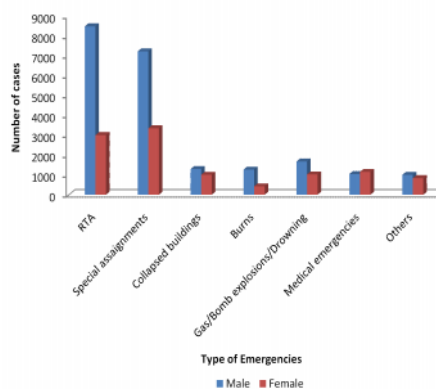


Fig. 4: Sex Distribution of the Aetiology of Emergencies recorded between 2001–2006

One of the major challenges of the next 15 years would be the provision of reasonable trauma care and efficient trauma system development in the developing countries of the world where pre-hospital care is mostly non-existent⁶. Presently, a few trauma centers are located in urban areas, leaving out the rural populace, and rehabilitation is almost totally lacking.⁶ Preparatory enhancement of the hospitals and staff resources is essential for the establishment of mass casualty protocols.^{7,8} The high incidence of emergency cases seen in this study is similar to findings from other studies in developing countries.⁹ Factors that may be responsible for this include low level of literacy, high level of poverty, poor infrastructural development and high human population. An average of 15 emergency cases was transferred to the designated medical centers per day during the period of this study. These were in addition to other emergencies and routine patients who attend these facilities. It is thus possible to have overstretched the facilities at these centres.

The male preponderance among the cases that were affected in the study is expected in the environment where the males are more involved in economic activities outside the safe home environment. The adolescent and adult groups were mostly affected. These groups are in the economically productive age groups. They are exposed to the various dangerous situations in the environment in the course of their various activities.

Trauma accounted for 90% of the emergencies that were seen during the study period. This is similar to the findings from previous studies from Ilorin by Solagberu *et al*¹⁰ and Izegebu *et al*¹¹ in Lagos. Izegebu *et al*¹¹ found trauma from road traffic accidents (RTA) to be the leading cause of death in Lagos. Various reasons were given for this. The bad driving habits of Lagos drivers, high traffic density, poor state of the roads and low level of literacy among the drivers were some of the reasons given.¹¹ A high level of case fatality was recorded as death at sites in the RTA in this study. “Special Assignments” refer to

situations in which the LASAMBUS crews were required to provide emergency services at certain places/areas where large crowds were gathered. These situations and occasions include political and non-political rallies, mass protests/demonstrations, sports festivals, traditional/religious festivals. These activities accounted for a large number of emergencies seen by LASAMBUS. Many of the minor injuries that were seen in such places were adequately attended to and discharged, sometimes for follow up at nearby healthcare facilities.

More than 60% of the total number of trauma cases that were seen were treated and discharged at the sites of emergency. Medical emergencies constituted only 6.8% of the cases that were seen during the study period. There was no recorded emergency call for cardiac related cases unlike the situation in the developed countries¹². This may be due to the low level of awareness about the activities of LASAMBUS among the people. Also important is the fact that the cardiac emergencies might not have been recognized and the LASAMBUS were thus not alerted.

The importance of integration of pre and intra-hospital care with minimum delay so as to reduce morbidity and mortality has been emphasized in various studies¹³⁻¹⁷. There were no records of the injury-arrival and injury-surgical intervention times in any of the trauma cases. This incomplete documentation of the transit and response periods has made the appraisal of the impact of the establishment of LASAMBUS in this study incomplete.

About 7% of the total number of patients were transferred in-between health facilities. Some of the patients that required specialist attention were transferred to LASUTH from GHL. Others were the recuperating patients of LASUTH that were well enough to be transferred to various General Hospitals for further management. This was to decongest the bed-spaces at LASUTH for admission of new patients.

The traffic situation in Lagos during the day is often chaotic. The ambulance crew reported the impedance of movement through the streets as one of their commonest problems. Occasionally,

when they reported late at the scenes of the emergencies, they were harassed by the relations and sympathisers. The road users at many times also delay the movement of the ambulances by not giving them the right of the way. The designated Emergency Medical Centers are located at Ikeja and Lagos Island. The centers are relatively far from many parts of the state. Given the peculiarities of road transport system in Lagos, the patients sometimes get to the hospitals hours after the evacuation by the ambulance.

The high mortality that was recorded at the sites of the emergencies in this study could have been due to a number of factors. These include: the aetiology and mechanisms of the emergencies, the intervals between the time of the injuries and commencement of definitive treatment. In those cases that involved gas explosions and petroleum product spillages, the ensuing flame engulf and totally burnt the victims before help could come. The victims that got drowned could not be rescued because of the difficult terrain of the sites of the emergencies, lack of appropriate rescue equipment for such terrains and help coming late. When buildings collapsed, the victims could not be salvaged on time due to the lack of appropriate rescue equipment that were required to lift heavy objects. Many of the deaths occurred due to the delays in rescue operations and the commencement of medical treatment.

For the population of Lagos State, the total number of ambulances were not adequate. When the number that were available at the time of this study is compared with the facilities that are available to the London Ambulance Service (LAS) that serves a population of 6.8 million and covering 600 square miles, the deficiencies will become more obvious. LAS in 1993 had 305 accident and emergency (A&E) ambulances, 445 non-emergency patient transport service (PTS) ambulances, 9 rapid response units, 2 motorcycle units and 1 helicopter unit.¹⁸

Land ambulance transportation may not be suitable for all the emergency cases in Lagos State due to the peculiarities of the road traffic system and the varying land terrains. The possibilities of using helicopters and fast

motor boats in the riverine areas should be explored. Voluntary organisations may also be encouraged to set up ambulance services as is found in many parts of the world including Pakistan.¹⁹

CONCLUSION

The Lagos State Government of Nigeria has pioneered the establishment of an organized state-wide emergency evacuation system with LASAMBUS in Nigeria. Although many cases have been treated and/or evacuated to the appropriate treatment centers, the system needs to be improved in order to reduce the case fatality and overall mortality rates.

RECOMENDATIONS

Public health enlightenment programmes to focus on injury control and prevention, should be commenced. The public should be educated on the need for the right of way for ambulances conveying patients at all times.

More ambulance points and vehicles should also be provided so as to get them closer to the people.

Other forms of evacuating and transporting the patients should be considered to supplement the road transportation. The peculiarities of the state should be considered in making the choices.

Health care establishments should be categorized into levels of injury care capability in a regional trauma system with in-built trauma registry.²¹ This is to streamline the institutions, avoid confusion during patient transfer, encourage specialization among the care providers and ultimately improve service delivery.

The documentation should be improved to assist adequate and unbiased assessment of the services.

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