Review Article

Trends in Trauma Services: A Review of the Nigerian Experience

Theophilus Maksha Dabkana[1], Friday Titus Nyaku[1], John Enekele Onuminya[2], Mutaleeb Shobode[3]

[1]Department of Orthopaedics and Trauma Surgery, Faculty of Clinical Sciences, College of Medical Sciences, University of Maiduguri, Maiduguri, Borno State, [2]Department of Orthopaedics and Traumatology, Faculty of Clinical Sciences, College of Medicine, Ambrose Alli University, Ekpoma, Edo State, [3]Department of Clinical Services, National Orthopaedic Hospital, Dala Kano, Kano, Nigeria

Abstract

Trauma care has been ongoing in Nigeria since the Colonial period when wounded soldiers from World War II were rehabilitated at a hospital in Lagos. This has evolved into a point that we now train specialists in trauma care in many hospitals in the country. In spite of progress made, trauma remains a neglected disease in Nigeria, organized trauma services remain a mirage and traditional bone setter's practice prevails with dismal outcomes. The purpose of this review is to appraise how Nigeria as a country has fared in the provision of trauma services and the way forward.

Keywords: Nigeria, review, services, trauma, trends

Introduction

The importance for the immediate care of the injured patient was realized at a time when specialization in many aspects of medical practice was ongoing. This became more so for the traumatize patient after many conflicts such as the second world war, Korean and Vietnam wars.[1] It was also realized that treatment of injured patients was expensive and most patients could not afford it, leading to untoward complications often resulting in death. People were then encouraged to pay premiums to health centers so that treatment became affordable whenever the need arose since they no longer had to pay out of pocket. Hence, an insurance system was established for citizens.[2]

In 1946, the Hill-Burton Act in the USA was passed where federal grants were given to states provided they met certain criteria such as community service obligations like maintaining an emergency room in their hospitals where patients were treated at no cost. This still operates in nonprofit hospitals in the US today.[3]

The importance of body fluid volume regulation, especially by blood transfusion on-site and early evacuation of the injured to sites where definitive treatment could be given was seen to improve survival as experienced in countries where these conflicts occurred, (this is still lacking in Nigeria today). This was made better by moving these facilities nearer to areas of conflicts, i.e., establishing clinics and medical centers very close to conflict areas. This was assisted by evacuating the victims from the site of conflict by air and within a short time, definitive treatment started, leading to more lives being saved.[4,5]

The experiences on the war front were then applied to the civilian population especially in the USA.[1] Apart from trauma, other emergencies such as acute coronary syndrome (ACS) had emergency care centers developed for them in various cities such as New York City, Los Angeles, Seattle, Columbus, and Miami, where doctors were either rushed to the patient or vice versa.[6]

The gains made from this made it more obvious that patients fared better when they received immediate and appropriate

Access this article online

Quick Response Code:

Website: www.njmonline.org

DOI: 10.4103/NJM.NJM_167_21

Address for correspondence: Dr. Theophilus Maksha Dabkana, Department of Orthopaedics and Trauma Surgery, Faculty of Clinical Sciences, College of Medical Sciences, University of Maiduguri, Maiduguri, Borno State, Nigeria.
E-mail: tmdabkana@unimaid.edu.ng

How to cite this article: Dabkana TM, Nyaku FT, Onuminya JE, Shobode M. Trends in trauma services: A review of the Nigerian experience. Niger J Med 2022;31:8-12.

Submitted: 18-Sep-2021 **Revised:** 04-Dec-2021
Accepted: 15-Dec-2021 **Published:** 22-Feb-2022

medical care, especially if the pre-hospital care was appropriate and they were then moved quickly and safely to hospitals or centers designated to treat trauma cases, (the pre-hospital care is still lacking in Nigeria).[7-9] The availability of equipment such as the computed tomography (CT) scan, magnetic resonance imaging (MRI), alongside good cardiovascular monitoring machines contributed to further development of an emergency medical system, emergency medical services (EMS).[10]

The public in most countries like the USA began to believe in their government after a landmark report was released in 1966 which re-affirmed that "Deaths and deformities resulting from Trauma was a neglected disease of the time" and the government was doing something to change this.[11] This report followed the explosion of number of injuries accompanied by deaths and deformities due to the increase in the number of vehicles (just as seen in Nigeria today), and sprawdling highways, (sprawdling and dangerous in Nigeria), and patients were only given first aid and asked to pay for further treatment, many of whom could not afford it then, resulting in unnecessary deaths and disabilities. Insurance policy was then made law for almost all citizens, (still abysmal in Nigeria). Also a Highway Safety Act was put in place and enforced, (almost nonexistent in Nigeria toady), by establishing a National Highway Traffic Administration in the Department of Transportation at the Federal level which saw the development of Regional Emergency centers both at the Federal and State level. This act however led to an exponential increase in the demand for medical personnel to run the new centers. There were also no specialists in trauma care and government then had to establish training centers. People who hitherto worked part-time now took up full time appointment with the emergency departments (EDs) leaving their areas pf primary assignment, depleting staff needed for other ailments that were not trauma related. Medical training was then expanded to meet the vacuum created.

As this system exploded, funding became a problem to run the EDs, pay staff and acquire equipment, from the 1970s to 1980s. This problem was solved by creating training centers for personnel (doctors, nurses, paramedics, and other supportive staff) and also legislation was made to compel government at the Federal and State to increase grants to the EDs.[12]

Trauma

Trauma is a surgical emergency. It is an injury that most often has a physical cause such as automobile accidents, assaults with sharp or blunt objects, entrapments, and blasts among others. In almost all of these causes, there is usually a psychological trauma that may linger on even after treatment known as "Post Traumatic Stress Disorder" which has to be managed as well. Non-traumatic life-threatening conditions such as heart diseases, chronic airway obstruction, chronic liver and kidney disease and cancers are generally not considered as trauma.

Trauma Management

To manage trauma effectively, there must be a system in place that functions twenty-four-seven. It must be well funded, well equipped and adequately staffed. The management of trauma shall begin at the site where it occurred, continue en-route to a designated place where definitive treatment can be given. In addition, the management of trauma does not end with the treatment in hospital or a trauma center but must continue through rehabilitation and full or near full recovery, so that patient can return to normal or near normal life style.

Trauma System

The American College Of Surgeons therefore came to the realization that there must be a comprehensive system in place for effective and quality Trauma Services to be achieved. The system is made up of paramedics, public awareness, good network of communication, designated hospitals or centers where definitive treatment is given and a good number of trained doctors (traumatologists, surgeons, physicians, nurses, anesthetists, physical therapists, psychologists, etc.), which must function as a unit.[12] As the practice of surgery began to rapidly develop, trauma management also had to evolve. The ACS also realized that a registry must be created of all cases for the purpose of planning, research and training.[13] Information collected from various wars on all injuries that were managed informed the trauma management team on the need for sub-specialization in trauma care itself such that a systematic approach to trauma care came into place in countries such as the USA, Great Britain and parts of Eastern Europe. This information was later synthesized into a document known as the "Optimal Criteria for the care of the injured Patient" by the American College of Surgeon and the Committee on Trauma.[14] Based on this document, many centers that were springing up in the USA and other countries were now classified based on the type of services they were able to provide. This was to be supervised by a new unit, "The Trauma/EMS Systems Program" under the Health Care Resources and Services Administration's Division, saddled with healthcare preparedness, in 2001. This new program provided national leadership for trauma care planning, infrastructure development, standards development and coordination with other agencies. By 2006 however, the US government could no longer finance the system due dwindling finances, leaving its financing to Health Insurance, NGOs, philanthropists and taxation on luxury services and goods by some states. Trauma centers however continued to be nonprofit-oriented services. Government however continued to regulate their activities to ensure quality of patient care.

Classification of Trauma Centers

Based on the type of services a center is able to provide, the ACS-COT in conjunction with the American Trauma Society, classified trauma centers into five levels. This classification took into account the cadre of specialists available, volume

of patients treated per year or number of major cases handled by each surgeon, contribution to trauma education, research and system planning. Level I being the highest where comprehensive care is available and level V the lowest where basic care is available. This classification also spelt out the modalities for referral.[15]

Organization of Trauma Services

A trauma center is not a profit making outfit. It is basically a place meant for saving lives in the first instance and later try to recoup any money if possible.[11]

Trauma care provides effective care of the injured patient but requires major financial costs in terms of readiness and availability of the simple triage and rapid treatment, extensive trauma team and specialized equipment. Traditional billing and collection practices do not fully recoup cost. Indirect effective use of the system however is vital to the sustenance of a trauma service. A universal solution is however not yet possible. The society must therefore find a way of contributing funds for trauma care and such funds must be judiciously managed and accounted for. Multinationals, philanthropists and None Governmental Organizations (NGOs) help fund trauma centers (TCs). All funds received are properly utilized and accounted for. Every trauma center reaches out to these organizations and individuals soliciting for funds and also organizes programs that will attract funds to the centers.[16-19]

Trauma care does not end up with EMS or EDs but from prior to injury (enlightenment) to full recovery and return to premorbid state of the injured patient. Government must therefore have a system in place where all trauma patients are taken care of, such as:

i. Ability to attend to patients at the site of injury (paramedics, nurses, doctors) no matter how remote the place is
ii. A good system of communication and transportation of the injured to the nearest facility
iii. Readiness of all trauma centers to receive and treat patients
iv. Funds for management of trauma cases are provided in each year's budget at all levels of government
v. Motivation of all staff working in trauma centers so that they can put in their best at all times.

Trauma Service System in Nigeria

From the above narrative, it has become obvious that there is little or no organized trauma service system in Nigeria as at today. There was a semblance of trauma care when the present National Orthopedic hospitals where established in Lagos and Enugu to carter for world war II and the Nigerian civil war victims, i.e., before they were given their present statutes by decree 91 of 1979 by then General Gowon Military government.[20] That semblance has almost been eroded and trauma service has become just like any other medical condition where patients are made to pay before being attended to.

Brief History of the National Orthopaedic Hospitals

The National Orthopaedic Hospital, Igbobi, started as a military hospital in 1943 and served as military rehabilitation camp for prisoners of war returning from World War II. It was named Royal Orthopaedic hospital by the colonial masters in 1945 and later Igbobi Orthopaedic hospital, still as a service center (nonprofit making). By 1967 when states were created, it became a full-fledged hospital of the Lagos state until it was taken over by the federal government in 1975 to serve as a National Orthopaedic Hospital.[21]

The National Orthopaedic Hospital, Dala, Kano, was established in 1959 by the colonial regime headed by Dr. A. F. Bryson (a Briton) as a hospital to treat bone diseases[22] was never built to carter for any war, civil or tribal victims. It passed through many changes in statutes until 1975 when the Federal government of Nigeria took it over from the Northern region and named it the National Orthopaedic Hospital, Dala, Kano.

National Orthopaedic Hospital, Enugu was established by the regional government of Ukpabi Asika at the end of the Nigeria Civil War (1967-1970) for maimed war victims and named "Emperor Haile Selassie Institute of Orthopaedics, plastic and ophthalmic surgery" for the role the then Ethiopian leader played mediating between the waring forces during the Civil War. It was located at the old government lodge with 200 acres of land provided for it. Before its take off the ophthalmic section was relocated. It was opened to the public in 1975. The formal opening by Mrs. Victoria Gowon was done on 4th April that year and by July of the same year, it was named State Orthopedic Hospital and it became a National Orthopedic Hospital Enugu when the Federal Government took it over later that year.[23]

By 1979, Decree 91 was promulgated establishing a board to run the three Orthopaedic hospitals[20] (Lagos, Kano and Enugu), and by 2000, each hospital had its own board to separately run it.[24]

In the over seven decades of their existence, the three hospitals have evolved from rehabilitation to full-fledged training centers in all areas of Orthopaedics, Trauma, Burns and plastics, Nursing and other cadres of medical staff at all levels of academics. All have excelled in the area of trauma care. However, none of these centers have an established trauma service system as practiced elsewhere in the developed world. It still operates as receiving centers from an unorganized system.[9] Casualties have to be brought in before they attend to them unlike a system where these patients are taken care of from the scene of injury, in route to designated centers and properly handed over by trained paramedics both by air and road transport systems, communication with designated treatment centers are well established so that these centers are ready to receive and treat these patients in terms of resource, personnel and ORs, and do not depend on government for the financing of their operations like what happens in Nigeria today

when funding comes from government and in most instances, the patients are asked to pay before services is rendered. In other climes also, these bills are borne by the society such as cooperate bodies, philanthropists, government legislation on businesses, such that no patient dies from his or her injuries because he/she does not have money or he/she is a "nobody" in the society. At the end of the day, each citizen has a sense of belonging to the society and therefore does whatever he or she can to support the government.

There was an attempt by the President Goodluck Ebele Jonathan administration when a trauma center was built at National Hospital Abuja Nigeria and commissioned in 2014. In his words, read by Vice President Namadi Sambo, "trauma centres are critical components of a Nation's healthcare delivery system as it requires resources, equipment and manpower to deliver a full range of specialized care needed by the severely injured patient. The centers were also required to maintain coordination with other facilities where the need for complementary expertise may be needed."[25] From the president's remarks, it was clear that to run the center was going to be expensive and all the personnel and equipment were not going to be adequate. This is yet to be achieved. In 2016, the then Nigerian minister of state for health and later Minister of health, Dr. Osagie Ehanire said that government will establish a level I trauma center in each of the six geo-political zones of the country, that all the paper work was completed and awaiting approval by Government.[26] This is yet to see the light of the day despite the huge amount of money and time expended to produce those documents.

As at May 2021, some facilities called "Trauma centers" have been built and some are on-going by both federal and state governments all over the country. These include the National Hospital Abuja, Uthman Danfodio University Teaching Hospital Sokoto, the Ondo State Trauma and Surgical Centre Ondo, one built and commissioned at UMTH Maiduguri in November 2020 but yet to take off as by October 2021 due to lack of staff and some basic equipment such as a functioning X-ray machine, CT scan, MRI and the fact that all the anesthetic machines cannot be put to use coupled with the lack of electricity following the damage to the national grid by the insurgents, one built at Gwagwalada in Abuja but later abandoned. From the available information, all these centers are level IV at the best and still depend on government for financing, equipping and personnel and are functioning decimally.

Trauma is truly a neglected disease in Nigeria. In spite of the enormous trauma challenges, there is no organized trauma services and the vacuum is aptly filled by the traditional bone setters (TBS). The TBS practice is readily available, accessible, affordable and acceptable by Nigerians despite its dismal outcomes.[27] Majority of the young productive age group who are the main victims of trauma in our settings are left with major disabilities for lack of standard trauma care.

The Future

There is a need for the Nigerian Government to take the health of its citizens, especially trauma patients, more serious. A department should be established in the Federal Ministry of Health (FMoH), headed by a Director General who will advise Government on the running of TCs in the country and as the minister of health rightly pointed out each Geo-political region should have a level I trauma center to be headed by directors and each state of the federation should establish at least one trauma center with a well-coordinated referral system. There is also need for the training of paramedics who will serve as marshals for taking care of all injured patients across the nation so that mortality and morbidity will be reduced to the barest minimum. Legislation must be put in place to ensure that all multi-nationals and NGO's pay for trauma services as is done in other climes. This is more pertinent with the rise in insurgency, insecurity, banditry, and increase in road traffic accidents due to the very bad roads across the country. Government should strengthen our laws to minimize trauma on the roads, curb insurgency and banditry and vote the minimum 15% for the health sector as it signed in the African charter. Government must realize that trauma forms a major part of health problems that must be given the attention it requires.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Boyd DR. The history of Emergency Medical Services (EMS) in the United States of America. In: Boyd DR, Eldich RF, Micik SH, editors. Systems Approach to Emergency Medical Care. Norwalk CT: Apleton-Century-Crofts; 1983.
2. Rosen B. Health Care System in Transition: Israel; 2015;17.
3. GAO (U.S General Accounting Office). States Assume Leadership Role in Providing Emergency Medical Services (GAO/HRD-86-42). Washington DC: GAO; 1986.
4. Dwight Jon Zimmerman. Battlefield Medicine in the Korean War; May 14, 2021.
5. Baker MS. Military medical advances resulting from the conflict in Korea. Part I: System advances and enhanced patient survival. Mil Med 2012;177:423-9.
6. Partridge JF, Geddes JS. A mobile intensive care unit in the management of myocardial infarction. Lancet 1967;2:271-3.
7. Ornato JP, Craren EJ, Nelson NM, Kimball KF. Impact of improved emergency medical services and emergency trauma care on the reduction in mortality from trauma. J Trauma 1985;25:575-9.
8. Syracuse JJ, Saillant NN, Hauser CJ. Technological advancements in the care of the trauma patient. Eur J Trauma Emerg Surg 2011;38:241-51.
9. Solagberu BA, Ofoegbu CK, Abdur-Rahman LO, Adekanye AO, Udoffa US, Taiwo J. Pre-hospital care in Nigeria: A country without emergency medical services. Niger J Clin Pract 2009;12:29-33.
10. National Academy of Science (US) and National Research Council (US) Committee on Trauma; National Academy of Science (US) and National Research Council (US) Committee on Shock. Accidental Death and Disability: The Neglected Disease of Modern Society. Washington (DC): National Press (US); 1966.
11. Taheri PA, Maggio PM, Dougherty J, Neil C, Fetyko S, Harkins DR, *et al.* Trauma center downstream revenue: The impact of incremental

patients within a health system. J Trauma 2007;62:615-9.
12. Trunkey DD. History and development of trauma care in the United States. Clin Orthop Relat Res 2000;374:36-46.
13. Nwomeh BC, Lowell W, Kable R, Haley K, Ameh EA. History and development of trauma registry: Lessons from developed to developing countries. World J Emerg Surg 2006;1:32.
14. ACS/COT. Resources for the Optimal Care of the Injured Patient. Chicago, III. The College 1999.
15. American College of Surgeons. Resources for Optimal Care of the Injured Patient. Chicago, III: ACS Committee on Trauma; 2014.
16. Committee on Trauma. Resources for Optimal Care of the Injured Patient. Chicago IL: ACS; 2006.
17. Rotondo MF, Bard MR, Sagraves SG, Toschlog EA, Schenarts PJ, Goettler CE, *et al*. What price commitment: What benefit? The cost of a saved life in a developing level I trauma center. J Trauma 2009;67:915-23.
18. Taheri PA, Butz DA, Lottenberg L, Clawson A, Flint LM. The cost of trauma center readiness. Am J Surg 2004;187:7-13.
19. Dunn JA. Trauma funding for Tennessee: The incredible journey. Bull Am Coll Surg 2007;92:18-20.
20. Orthopedic Hospitals Management Board Act 91. Establishment of Board of Management, etc., Establishment of Orthopaedic Hospitals Management Board. Available from: https://www.judy.legal>79>91. [Last accessed on 1979 Sep 28].
21. National Orthopaedic Hospital, Igbobi, Lagos. Available from: https://www.nohl.gov.ng.
22. National Orthopaedic Hospital, Dala, Kano. Available from: https://www.nohkano.gov.ng.
23. National Orthopaedic Hospital, Enugu. Available from: https://www.nohenugu.gov.ng.
24. Orthopedic Hospitals Management Board Act. Arrangement of Sections. Establishment of Board of Management, etc., SECTION. Establishment of Orthopaedic. Available from: https://www.nlipw.com.orthopedic-hospital.
25. Jonathan commissions Nigeria's National Trauma Centre; 11 August, 2014. Available from: https://www.premiumtimesng.com.
26. Trauma Centres Achives | Premium Times Nigeria. Tag: Trauma Centres. National Hospital Abuja. Nigeria to Establish Trauma Centres in Major Hospitals. By Agency Report; November 17, 2016. Available from: https://www.premiumtimesng.com. [Last accessed on 2016 Nov 17].
27. Onuminya JE. The role of the traditional bone setters in primary fracture care in Nigeria. South Afr Med J 2004;98:652-8.