

Cardiopulmonary Resuscitation Capacity in Referral Hospitals in Nigeria: Understanding the Global Health Disparity in Resuscitation Medicine

Yuanting Zha, M.D., M.P.H., Mojisola Ariyo, M.D., Olabiyi Olaniran, Promise Ariyo, M.D., M.P.H., Camila Lyon, M.D., Queeneth Kalu, M.B.B.S., Asad Latif, M.D., M.P.H., Byron Edmond, M.D., John B. Sampson, M.D.

Conflict of interest: None declared.

Acknowledgements: We are grateful to the Nigerian Society of Anaesthetists and to Babcock University Teaching Hospital for their continued support and assistance. This study was partially funded by the Johns Hopkins Bloomberg School of Public Health. The content of this paper is the responsibility of the authors and does not necessarily represent the official views of these entities.

Abstract: Introduction: Little is known about the state of resuscitation services in low- and middle-income countries (LMICs), including Nigeria, Africa's most populous country. We sought to assess the cardiopulmonary resuscitation (CPR) care in referral hospitals across Nigeria to better inform capacity-building initiatives.

Methods: We designed a survey to evaluate infrastructure, equipment, personnel, training, and clinical management, as no standardized instrument for assessing resuscitation in LMICs was available. We included referral teaching hospitals with a functioning intensive care unit (ICU) and a department of anaesthesiology. We pilot-tested our tool at four hospitals in Nigeria and recruited participants electronically via the Nigerian Society of Anaesthetists directory.

Results: Our survey included 17 hospitals (82% public, 12% private, 6% public-private partnership), although some questions include only a subset of these. We found that 20% (3 out of 15) of hospitals had a cardiac arrest response team system, 21% (3/14) documented CPR events, and 21% (3/14) reviewed such events for education and quality improvement. Most basic supplies were sufficient in the ICU (100% [15/15] availability of defibrillators, 94% [16/17] of adrenaline) but were less available in other departments. While 67% [10/15] of hospitals had a resuscitation training program, only 27% [4/15] had at least half their physicians trained in basic life support.

Conclusion: In this first large-scale assessment of resuscitation care in Nigeria, we found progress in training centre development and supply availability, but a paucity of cardiac arrest response team systems. Our data indicate a need for improved capacity development, especially in documentation and continuous quality improvement, both of which are low-cost solutions.

Keywords: Africa ■ CPR ■ resuscitation ■ critical care medicine ■ LMIC ■ anesthesia

Author affiliations: Yuanting Zha, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA; University of California Irvine School of Medicine, Irvine, CA, USA; Mojisola Ariyo, Babcock University, Ben Carson Sr. School of Medicine, Ilishan-Remo, Ogun, Nigeria; Emory University School of Medicine, Atlanta, GA, USA; Olabiyi Olaniran, Babcock University, Ben Carson Sr. School of Medicine, Ilishan-Remo, Ogun, Nigeria; Promise Ariyo, Johns Hopkins University, Department of Anesthesiology & Critical Care, Baltimore, MD, USA; Camila Lyon, Vanderbilt University, Department of Anesthesiology, Nashville, TN, USA; Queeneth Kalu, University of Calabar Teaching Hospital, Calabar, Cross River, Nigeria; Asad Latif, Johns Hopkins University, Department of Anesthesiology & Critical Care, Baltimore, MD, USA; Byron Edmond, Walter Reed National Medical Center, Bethesda, MD, USA; John B. Sampson, Johns Hopkins University, Department of Anesthesiology & Critical Care, Baltimore, MD, USA

Correspondence: John B. Sampson, Johns Hopkins University, Department of Anesthesiology & Critical Care, Baltimore, MD, USA., email: jsampso4@jhmi.edu

© 2017 The Authors. Published by Elsevier Inc. on behalf of the National Medical Association. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<https://doi.org/10.1016/j.jnma.2017.09.002>

INTRODUCTION

Since 1957 when Peter Safar wrote “The ABC of Resuscitation,” the technology, practices, and protocols for cardiopulmonary resuscitation (CPR) have continually been refined, with many hospitals requiring maintenance of infrastructure for basic and advanced cardiac life support (BLS and ACLS, respectively).¹ In high-income countries, it is now standard of care that hospitals have accessible and functional equipment, well-trained providers, and an organized response process.

Over time, basic public health principles such as clean water and vaccination have been appropriately emphasized in low- and middle-income countries (LMICs), yet with the unfortunate consequence of neglecting further development of hospital-based care. Recent international initiatives, including the World Health Organization (WHO) 68th World Health Assembly and Lancet Commission on Global Surgery, have called for increased global access to emergency care, surgery, and anaesthesia support.^{2–4} Crucial to the delivery and expansion of surgical care is the presence of functional facilities with resuscitative capabilities.

There is a paucity of data on the state of resuscitative services in LMICs, with a few studies highlighting the lack of infrastructure for the provision of resuscitation.^{5,6} Only 15% of the intensive care units (ICUs) assessed in a survey of various LMICs reported using checklists for acute resuscitation.⁷ Although anaesthesiologists play a major role in the development and maintenance of ICU care around the world, there was only one anaesthesiologist among 16 secondary hospitals surveyed in a recent Nigerian study.⁸ When intubation was required, one hospital reported a delay of over 2 h between the decision to intubate and completion, citing a lack of skilled personnel as the most common cause for delay.⁹ Additionally, between half and three quarters of operating rooms in

Sub-Saharan Africa lack pulse oximeters, indicating poor availability of essential equipment.¹⁰

Countries such as Nigeria have undertaken improvement efforts to develop higher levels of care.¹¹ However, current efforts focus primarily on training of local personnel to provide such care.^{12–15} However, trained personnel cannot care for patients without the proper infrastructure and health system implementation, such as the presence of proper equipment and standardized protocols. Such information may also serve as an indicator for the readiness of local healthcare systems in providing effective emergency, essential surgical, and anaesthesia care as components of universal health coverage, as urged by the 68th Assembly of the WHO.²

We assessed the resuscitation capacity in referral teaching hospitals across Nigeria to better inform capacity-building initiatives. In this survey-based study, we examined equipment, medications, training, and infrastructure in hospitals that have developed an ICU. The presence of an ICU was used as an indicator of readiness for the development of a CPR program and the ability to care for patients with return of spontaneous circulation.

METHODS

Survey development

We designed a survey to assess CPR capacity, as a literature search did not reveal an available standardized instrument for resuscitation assessment in LMICs. The survey was pretested with two clinical researchers who have expertise in instrument development. In January 2016, we pilot-tested our tool using a convenience sample of four hospitals in Nigeria. Purposive sampling was used to select survey respondents from each facility based on exposure and experience with treating cardiac arrest patients (e.g., anaesthesiology consultants and registrars, nurse anaesthetists, intensivists, casualty officers) and knowledge of medication and equipment availability, training, and cardiac arrest response systems in the hospital. Data from these four hospitals were included in the final analysis.

The final survey instrument was a web-based questionnaire distributed by Survey Monkey (SurveyMonkey Inc., Palo Alto, CA, USA). It included 89 questions to assess hospital characteristics, infrastructure, resuscitative medication and equipment availability, resuscitation training of hospital staff, and systems of resuscitation management (Appendix 1). Definitions of resuscitation supplies were based on guidelines for cardiac arrest by the American Heart Association.¹⁶ Medications and equipment were defined as being present if they were available >50% of the time when required for treating cardiac arrest.

Study setting and procedures

Inclusion criteria for hospitals consisted of Nigerian referral teaching hospitals with both a functioning ICU and a department of anaesthesiology. To recruit participants, we used email to contact the heads of anaesthesiology departments listed in the Nigerian Society of Anaesthetists directory. Of the respondents, only those that indicated presence of an ICU were included in the final analysis.

Analysis

Descriptive statistics and frequencies were calculated with Stata 13.0 (StataCorp, College Station, TX, USA) and Excel 2013 (Microsoft, Redmond, WA, USA). Qualitative open-ended responses were reviewed for key common themes.

Ethics

This study was exempt from review by the Johns Hopkins Institutional Review Board and approved by the Babcock University Health Research Ethics Committee in full compliance of the institutional guidelines, rules, and regulations of the National Code for Health Research Ethics. Hospital and respondent names were de-identified, and informed consent was obtained from each respondent. Respondents were given the opportunity to receive survey findings at the completion of the study.

RESULTS

Characteristics and locations of hospitals

Respondents were a convenience sample of hospitals throughout various geographic areas of Nigeria, from the directory of heads of anaesthesiologists at referral teaching hospitals (n = 32). We received 15 electronic responses, giving a response rate of 46.9% (15/32). Two were excluded because the hospitals lacked an ICU. After adding in data from the four pilot testing hospitals, our final sample size was 17 hospitals (Figure 1). The following regions were represented: South-south (6), South-west (4), South-east (3), North-central (3), and North-west (1). Represented hospitals included 14 public, 2 private, and 1 public-private partnership facility. The median hospital size was 500 beds (interquartile range [IQR], 350–600), and median ICU size was 5.5 beds (IQR, 5–6).

Hospital layout and infrastructure

Most hospital facilities consisted of separate buildings for various departments. Over half of surveyed hospitals had operating rooms that were directly connected to the ICU (i.e., it was not necessary to go outdoors to transfer a

Download English Version:

<https://daneshyari.com/en/article/8945808>

Download Persian Version:

<https://daneshyari.com/article/8945808>

[Daneshyari.com](https://daneshyari.com)