

Emergency Department Deaths in a Nigerian University Hospital: Deaths Too Many

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ABSTRACT

Objectives: We reviewed the demographic pattern and distribution of deaths in the emergency department (ED) of the University College Hospital (UCH) in order to identify gaps in the standard of care, thereby providing evidence for intervention and enhanced research in acute care.

Methods: After obtaining institutional ethics approval, we retrospectively studied all deaths in the ED of UCH from January 1 to December 31, 2011. Data were retrieved from the ED's electronic register.

Results: During the 12-month period, a total of 10 728 patients attended the emergency centre and 647 deaths occurred, giving a mortality rate of 6.0%. Male deaths constituted 62% of all deaths. The mean age at death was 44.5 ± 19.1 (range 5 months–92 years). The age group with the highest proportional mortality was 60–69 years (11.4%). Out of all deaths, 295 (45.6%) had alterations of consciousness. Medicine was the specialty with the most deaths (56%), followed by surgery (40%) and lastly, obstetrics and gynaecology (4%). Of the 190 patients that died from trauma, 153 (80.5%) had injury severity score ≥ 15 . Most deaths (75.4%) occurred within 24 hours of arrival and the 12-hour night shift had 322 (50%) of the mortalities. Autopsies were carried out in 36 (5.6%) of the 647 deaths. Of the 36 autopsies, 24 (66.7%) were deaths due to medical causes.

Conclusion: Mortalities within 24 hours of presentation at the ED of UCH remain high. This calls for an efficient pre-hospital care, well-organized emergency transport system, new guidelines, establishment of protocols and regular audit.

Keywords: Audit, death/mortality, emergency department

Muertes en el Departamento de Emergencias en un Hospital Universitario de Nigeria: Demasiadas Muertes

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RESUMEN

Objetivos: Examinamos el patrón demográfico y la distribución de las muertes en el Departamento de Emergencias (DE) del University College Hospital (UCH) con el fin de identificar brechas en el nivel de atención, proporcionando así evidencias de la intervención y mayor investigación en los cuidados intensivos.

Métodos: Tras obtener aprobación ética institucional, estudiamos retrospectivamente todas las muertes en el DE de UCH del 1ero de enero al 31 de diciembre de 2011. Los datos fueron tomados del registro electrónico del DE.

Resultados: Durante un periodo de 12 meses, un total de 10728 pacientes asistieron al centro de emergencia, y ocurrieron 647 muertes, para una tasa de mortalidad de 6.0%. Las defunciones masculinas representaron el 62% de las muertes. La edad media de muerte fue 44.5 ± 19.1 (rango 5 meses-92 años). El grupo de edad con la mayor mortalidad proporcional fue de 60-69 años (11.4%). Del total de muertes, 295 (45.6%) pacientes tenían alteraciones de la conciencia. La medicina fue la especialidad con más muertes (56%), seguida de la cirugía (40%) y por último, la obstetricia y la ginecología (4%). De los 190 pacientes que murieron de traumatismo, 153 (80.5%) tuvieron una puntuación de gravedad de la lesión ≥ 15 . La mayoría de las muertes (75.4%) ocurrieron dentro de las 24 horas de la llegada, y el turno

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de noche de 12 horas tuvo 322 muertes (mortalidad 50%). Las autopsias se llevaron a cabo en 36 (5.6%) de las 647 muertes. De las 36 autopsias, 24 (66.7%) fueron muertes debidas a causas m3dicas.

Conclusi3n: *La mortalidad dentro de 24 horas de presentaci3n en el DE de UCH sigue siendo elevada. Esto requiere una atenci3n pre-hospitalaria eficiente, un sistema de transporte de emergencia bien organizado, nuevas directrices, establecimiento de protocolos, y auditorias peri3dicas.*

Palabras claves: Auditoria, muerte/mortalidad, Departamento de Emergencia

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INTRODUCTION

The emergency department (ED) represents a portal of entry into a hospital for the acute care of patients without prior appointment either by their own means or an ambulance. The hallmark of ED presentation is time-critical health problems requiring prompt diagnosis and medical interventions to prevent avoidable deaths and disability. This challenges the practice in our institution where junior doctors without the requisite knowledge and skill in acute care are the first-line caregivers under the supervision of non-emergency physicians. Since Afuwape and colleagues (1) reported 3.3% mortality in 2005, hospital management employed more medical officers and three other consultants in response to increasing ED attendance. The impact of this change prompted this audit. We reviewed the demographic pattern and distribution of deaths and discussed measures to improve the standard of care.

SUBJECTS AND METHODS

After obtaining institutional ethics approval, a computerized search of the ED's e-register was made to uncover all deaths that occurred after presentation or admission from January 1 – December 31, 2011. The e-register was designed using the Microsoft Access database software and incorporates patient's information including name, age, gender, date, time and shift of admission, brief medical history, categorization into specialties, initial and definitive diagnosis, and outcome. All patients who were dead on arrival at the centre were excluded.

This study was carried out at a university teaching hospital emergency department, which receives over 10 000 unrestricted emergencies annually with an admission rate of 47%. All medical, surgical, obstetric, gynaecological emergencies as well as paediatric trauma cases are attended to at this centre, which also serves as a referral centre to other hospitals in this locality. The department is manned by medical officers, rotating resident doctors in surgery, dentistry and family medicine under the supervision of four consultants (an anaesthetist, a cardiologist, a gastroenterologist and a general surgeon). The full-shift pattern in place has a six-hour morning duty (8.00

am–2.00 pm), six-hour afternoon shift (2.00–8.00 pm) and a 12-hour night shift (8.00 pm–8.00 am). The consultant coverage is 24 hours on a closed user group telephone system but physical presence at best ends about the beginning of the night shift.

All statistical analyses were performed using the statistical programme SPSS for Windows 17.0 (SPSS Inc, Chicago, IL, USA). Demographic variables are represented using tables and charts while summary statistics are done using means and proportions. For the injured that died, we subjected our data to trauma scoring systems and calculated the injury severity score (ISS) from the Abbreviated Injury Scale as an index of the severity of injury. The arithmetic mean was derived and the proportion of death above the ISS threshold of 15 was determined.

RESULTS

During the 12-month period, a total of 10 728 patients (49% males, 51% females) attended the emergency department and 647 deaths occurred, giving a mortality rate of 6.0% (Table 1).

Male deaths constituted 62% of all deaths. The mean age was 44.5 ± 19.1 years (range 5 months – 92 years). Out of the 647 deaths, 295 (45.6%) were among those with alterations of consciousness. Ninety-six patients, who constituted 15% of the mortalities, were admitted on account of terminal illnesses, especially malignant neoplasms.

Even though the highest percentage of deaths recorded during the study period was within the 30–39-year age group (27.2%); the age group with the highest proportional mortality was 60–69 years (11.4%).

Medicine was the specialty with the most deaths, 363 (56%), followed by surgery, 258 (40%) and lastly, obstetrics and gynaecology, 26 (4%). Of the 258 surgical patients that died, trauma accounted for 190 (73.6%) and non-trauma 68 (26.4%). The mean ISS was 31.7 ± 22.7 . Of the 190 patients that died from trauma, 153 (80.5%) had $ISS \geq 15$. A breakdown of the mortality with respect to length of stay (LOS) in the ED showed that 283 (43.4%) deaths occurred within five

Table 1: Monthly spread of attendance and mortality at the Emergency Department

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Total attendance	930	132	919	932	1015	961	992	994	936	1012	925	980	10 728
Mortality	60	0	65	55	51	65	54	75	58	56	41	67	647
% Mortality	6.5	0	6.9	5.9	5.0	6.7	5.4	7.6	6.2	5.5	4.4	6.8	6.0

hours of admission, and rose to 488 (75.4%) by 24 hours stay (Figure).

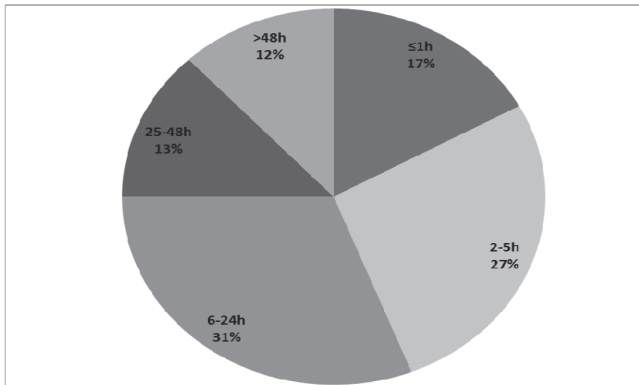


Figure: Length of stay in the emergency department before death (hours).

The night shift had the most deaths, 322 (49.8%) followed by afternoon shift, 167 deaths (25.8%) and lastly, the morning shift 158 (24.4%). The highest mortality in the ED was recorded in the month of August (Table 1). Postmortem examinations were carried out in 36 (5.6%) of the 647 deaths. Of the 36 autopsies, 24 (66.7%) were deaths due to medical causes. Table 2 shows the autopsy rate by age of patients that died in the ED.

Table 2: Autopsy rate by age of patients who died in the emergency department

Age (years)	Number of deaths	Number of autopsies (%)
0-9	18	0 (0)
10-19	37	0 (0)
20-29	91	9 (9.9)
30-39	127	6 (4.7)
40-49	104	8 (7.7)
50-59	84	5 (5.9)
60-69	104	4 (3.8)
70-79	52	3 (5.8)
80-89	18	1 (5.6)
90-99	4	0 (0)
Unknown	8	0 (0)
Total	647	36 (5.6)

DISCUSSION

Our results showed that since the last audit (1), ED attendance rose two-fold (5100 to 10 728) and so did the mortality rate from 3.3% to 6%. While we consider this mortality rate high, not all these deaths were totally unexpected because approximately 98 (15%) patients were terminally ill with malignant neoplasms. In a North Carolina ED, a much higher percentage (85%) was categorized as “expected” deaths in patients who had suffered pre-hospital cardiac arrest or terminal illnesses (2). However, our mortality rate is higher than Ekere’s data (2%) but comparable with other workers in our region: 5% in southeastern Nigeria, 5.2% in Benin (Nigeria) and 6.8% in Port Harcourt, Nigeria (3-6). Time-sensitive illnesses and injuries

present in the ED requiring timely interventions, and using mortality rate as a measure of the quality of care, the high rates in our practice environment compared with 0.05-0.5% reported by researchers in advanced countries may highlight lack of pre-hospital care, poor infrastructure, absence of emergency transport system and ED staffed by untrained doctors and nurses, as contributory factors (7-9).

The higher mortality rate in males compared with female patients in our audit followed the pattern reported by other studies (1, 3, 4, 8-10). This appears to be a global trend and understandably, the hazard ratio is higher for men than women in the categories of all causes of death in the ED, such as malignant neoplasms, cerebrovascular disease, ischaemic heart disease, trauma and suicide (11). Our finding of most deaths under 50 years (58.1%) is congruous with local studies, trauma emerging as the leading cause of death (1, 3, 4). However, we found that mortalities in the 7th and 8th decades of life (61-80 years) resulted more from medical emergencies. This is in keeping with Beckett *et al*’s report where 66% of deaths in three London EDs occurred in patients over 60 years (7). We report that while cerebrovascular accident was the major cause of medical emergency deaths in our environment, cardiac causes were predominant in Europe, the United States of America (USA) and some non-Western nations (1, 3, 7, 12-14).

Our ED service model, starting with nurses who are not trained in emergency nursing and junior doctors who lack procedural competence in acute care, and who are the first-line caregivers under the supervision of consultants who are not emergency medicine physicians, require scrutiny. Our ED, with an average yearly attendance exceeding 10 000, must evolve more efficient processing of large numbers of patients and ensure a high standard of safe emergency care. This is imperative with rising trauma deaths, especially from road crashes and medical emergencies, notably strokes, with many of these patients presenting with alterations of consciousness. In our study, 45.6% had altered consciousness and 43.4% of deaths occurred within five hours of ED admission. Our data showed a mean ISS trauma severity score of 31.7 which is two-fold higher than the threshold of 15, indicating that most deaths (80.5%) were from major trauma, which may not be attributable to the inexperience of the ED staff. This probably highlights the vulnerability of our patient population against the background that in their shock states and altered sensorium, with little or no pre-hospital care and an ambulance system virtually non-existent, they are unsalvageable when they arrive to the ED and therefore, die early. Junior doctors who see the bulk of these patients actually mark time until they are able to enter residency training in diverse specialties including laboratory medicine and public health. Our low autopsy rate of 5.6% follows the trend reported by Baker and Clancy (20%) and Nasfi *et al* (11.5%) with concerns about delaying of the burial and fear of body mutilation cited by researchers (8, 10, 15, 16).

In conclusion, the high ED mortality rates in this audit call for an appraisal of the present system to promote an efficient pre-hospital care, well-organized ambulance service, meet the clinical needs of an increasing number of patients and the specialized standard of care required in the ED.

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