

Pattern of Deaths in the Adult Accident and Emergency Department of a Sub-Urban Teaching Hospital in Nigeria

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Abstract: To review and highlight the demographic patterns of mortality and to determine the frequency and causes of accident and emergency deaths in a sub-urban tertiary care centre of a developing country and suggest measures that might improve the standard of care offered to patients within the adult Accident and Emergency (A&E) department. We conducted a retrospective chart review over a 3 year period (January 2005-December 2007) for all patients who died in the A&E department of Imo State University Teaching Hospital (IMSUTH), Orlu. Casualty records including attendance registers, Nurses' report books and death certificates were used to extract demographic indices and causes of death. The data generated were analyzed using SPSS version 11 software. A total of 5754 attendances were recorded and 281 deaths occurred over the period with crude mortality rate of 4.88%. Male mortalities were 195(69.40%) and females 86(30.60%), ratio 2:3:1. The age ranged from 19 to 100 years averaging 47.32 ± 4.5 years, with more deaths occurring in 41-50 years age group. The most frequent cause of death was Road Traffic Accidents (RTA) with 23.13 %. Most deaths occurred within 10 to 26 hours of arrival at the A&E. Trauma deaths were within the age group of 20-30 years. The need for provision of continuous experienced senior casualty officers with rapid access to appropriate facilities is advocated as well as establishment of an audit protocol. Effective pre-hospital transportation system should be put in place by the government in order to reduced access time to the hospital.

Key words: Accident, emergency, hospital, mortality, review, sub-urban

INTRODUCTION

The Accident and Emergency (A & E) Department constitutes one of the vital entry points of patients into the healthcare facility of the hospital the world over. This facility responds to and manages variety of cases in all the clinical areas. The A & E department of any hospital provides an insight to the quality of care available in the institution (Ekere *et al.*, 2005) The quality of care in the emergency room is an indirect indicator of the standard of healthcare delivery that is given in a health institution. Reports from various centres as well as studies (Ekere *et al.*, 2005; Osime *et al.*, 2007; Onwuchekwa *et al.*, 2008; Turay, 2009) show wide variations in mortality in the accident and emergency department. Some of these variations can be explained by variables such as the case mix of patients being treated as well as other factors that affect seeking emergency care like delay, transportation, ignorance and poverty. This retrospective study is an audit review of the mortality in the adult A and E department of Imo State University Teaching Hospital (IMSUTH) Orlu, Nigeria for three consecutive years 2005-2007. The aim of this review was to highlight the demographic patterns of mortality and to determine the frequency and causes of accident and emergency deaths in a sub-urban tertiary care centre of a developing country and to suggest any

measures that might improve the standard of care offered to patients within the adult A&E department.

MATERIALS AND METHODS

A 3-year retrospective review of patients attended to in the Accident and Emergency department from January 2005-December 2007 was carried out in IMSUTH, Orlu that was established in 2004. Casualty records including attendance registers, Nurses' report books and death certificates were used to extract demographic indices and causes of death. All deaths occurring within this period were reviewed. Immediate pre-hospital, hospital, post-mortem data where available and death certificates where applicable were evaluated to ascertain causes of death among others. All cases that died or were certified dead within the unit were the only ones included in the study. The data generated were analyzed using SPSS version 11 software and the results presented in descriptive and tabular forms.

RESULTS

The total number of patient attendance to the A & E for the three years, 2005-2007 was 5754 made up of males 3400 (59.09%) and females 2354 (40.91%) with a

male to female ratio of 1.4:1. and a notable increase in attendance over the years (Table 1). Two hundred and eighty-one (281) deaths were recorded over the period with a crude mortality rate of 4.88%. Male deaths were 195(69.40%) and females 86(30.60%), with a ratio of 2.3:1. The age range was 19 to 100 years with mean of 47.32±4.5 years. The highest number of deaths was within the 41–50 age groups (Table 2). Majority of deaths were below 50 years. Considering the total number of patients' attendance to the A & E, the mortality rate stood at males 3.39% and females 1.49%. The yearly mortality was 58(20.64%), 99 (35.23%) and 124(44.13%) for 2005, 2006 and 2007 respectively. The monthly spread of mortality (Table 3), showed that the highest number of deaths was recorded in September. There is no explanation for this observation. The highest clinical cause of death was RTA (n = 65) (Table 4). Most mortality occurred within 10 to 26 hours of arrival at the A&E. Majority of trauma deaths were within the age group of 20-30 years. The total number of death-on-arrival or brought-in-dead (BID) was 56 (19.93%)

DISCUSSION

Imo State University Teaching Hospital (IMSUTH) is located in the sub-urban town of Orlu in Imo State of Nigeria. It serves the whole State with a population of 3.5 million people and was established in 2004. In present study a total of 281 deaths were recorded out of 5754 patients treated in the A&E showing a crude mortality rate of 4.88%. A similar study in Port-Harcourt, Nigeria in an urban Teaching Hospital over a 3 year period (Ekere *et al.*, 2005) reported a crude mortality rate of 2%. The marked difference in the mortality rate could be due to the urban setting and superior infrastructural facilities that are available to the older and bigger hospital in Port-Harcourt. Other local studies reported mortality rates of 6.8% (Onwuchekwa *et al.*, 2008) 4.7% in Freetown, Sierra Leone (Turay, 2009) and 5.2% in Benin, Nigeria (Osime *et al.*, 2007) However our male to female ratio of 2.3:1 which shows more male deaths is comparable and consistent with reports by most other studies (Ekere *et al.*, 2005; Osime *et al.*, 2007; Onwuchekwa *et al.*, 2008; Turay, 2009) carried out locally in Nigeria and worldwide (Adesunkanmi *et al.*, 2002; Cothren *et al.*, 2007; Moshiro *et al.*, 2001). This is not surprising as men especially the younger age group are involved in all manners of activity. Males are more likely to be involved in violent activities and motor vehicle crashes, and often sustain more severe injuries compared to females (Osime *et al.*, 2007). The frequency of causes of death varies from centre to centre as well as by regions (Ekere *et al.*, 2004). Mortality in the A&E may result from various factors including incompetence of the attending junior physicians, delay in presentation and inadequate facilities

Table 1: Attendance of patient to the A & E imsuth 2005-2007

Sex	2005	2006	2007	Total
Male	1035	978	1387	3400
Female	661	681	1012	2354
Total	1696	1659	2399	5754

Table 2: Age distribution of the mortality

Age group	No. of deaths	PER (%)
0–10	0	0.00
11–20	8	2.85
21–30	32	11.39
31–40	51	18.15
41–50	76	27.05
51–60	43	15.30
61–70	35	12.46
71–80	25	8.90
81–90	10	3.56
91–100	1	0.36
Total	281	100.00

Table 3: The monthly spread of mortality

Month	2005	2006	2007	Total	PER (%)
Jan	3	3	12	18	6.41
Feb	4	4	5	13	4.63
Mar	4	4	10	18	6.41
Apr	6	8	6	20	7.12
May	5	5	8	18	6.41
Jun	4	11	11	26	9.25
Jul	5	13	13	31	11.03
Aug	6	11	14	31	11.03
Sept	6	15	14	35	12.45
Oct	4	5	9	18	6.41
Nov	4	8	10	22	7.82
Dec	7	12	12	31	11.03
Total	58(20.64%)	99(35.23%)	124(44.13%)	281	100.00
Yearly mortality rates					
	1.01%	1.72%	2.16%	4.88%	

Table 4: Causes of patients death

Aetiology	No.	PER (%)
RTA	65	23.13
BID	56	19.93
CVA	31	11.03
Acute Abdomen	22	7.83
Diabeticcoma	19	6.76
CCF	17	6.05
Renalfailure	14	4.98
Non Rta Trauma	12	4.27
Liver Disease	11	3.91
HIV/AIDS/PTB	11	3.91
Septicaemia	8	2.85
Cancers	5	1.78
PPH (Post Partum Haemorrhage)	4	1.42
Chicken Pox	2	0.71
B. Pneumonia	2	0.71
Malaria	1	0.36
Burns	1	0.36
Total	281	100.00

(Onwuchekwa *et al.*, 2008). Majority of deaths in our series were below 50 years 167 (59.44%) with a peak at 41-50 years age group 76(27.05%). Beckett *et al.* (1987) in a study of deaths in A&E departments of three London hospitals noted that many of the patients that died in A&E were elderly in which 66% of the patients who died were over 60 years. The marked difference with our finding

could be attributed to advanced medical care and facilities and, longevity in the developed countries like Britain. Trauma related deaths constituted the most common cause of mortality with Road Traffic Accidents (RTA) being the most common cause 23.13%. (n = 65). RTA has consistently been reported as the major cause of deaths in the A&E in Nigeria – 41.6% (Osime *et al.*, 2007) 57.8% (Ekere *et al.*, 2004) 70.5% (Adesunkanmi *et al.*, 2002) 75% (Solagberu, 2002) as well studies carried out all over the world (Yagmur *et al.*, 1999; Cothren *et al.*, 2007; Siddiqui *et al.*, 2004; Moshiro *et al.*, 2001; Solagberu *et al.*, 2003a, b; Pikoulis *et al.*, 1999; Nordberg, 2000). Aptly stated the incidence of trauma deaths is on the increase, partly due to rapid growth of motorised transport and to expansion of industrial production without adequate safety precautions (Gordon *et al.*, 1989). We found that the age group mainly involved in RTA were those between 20-30 years. Osime *et al.* (2007) noted that the age group from 21-40 years is usually very active and mobile and often contributes a greater percentage of nation's economic work force. Other agents of trauma deaths noted included falls (Adesunkanmi *et al.*, 2002; Cothren *et al.*, 2007). Gunshot wounds, blows and blunt trauma. Macleod *et al.* (2004) stated that the independent indicators of mortality, which are untreatable in trauma, included head injury, increasing age, and injury severity score. Beckett *et al.* (1987) in their study showed that Myocardial infarction/Ischaemic heart disease were the commonest cause of death in the A&E - 35 out of 63 deaths (55.56%). This is likely due to different life styles here and in Britain. The second leading cause of death in our series was 'brought-in-dead' (BID) with no known cause of death. These were cases certified dead in the A & E who died either at home or in transit and summed up as pre-hospital deaths. It is worrisome that the actual cause of death in this group of cases remained undetermined, as autopsy was not done on them. This was due largely to local myths that doing so would make them re-incarnate with missing parts. This belief has been held tenaciously despite religious inclination. In a retrospective study by Khan *et al.* (2007) they reported a high 70% of their mortality cases who were dead-on-arrival while Ekere *et al.* (2005) recorded 3.6% of the cases dead-on-arrival. Other causes of mortality were Cardiovascular Accident (CVA) 31 (11.03%); Acute Abdomen 22 (7.83%); Congestive Cardiac Failure (CCF) 17 (6.05%); Diabetic coma 19 (6.76%) and Renal failure 14 (4.98%). Sepsis was responsible for 8 (2.85%) of deaths in our series as against 23% recorded by Khan *et al.* (2007) HIV/AIDS deaths were 11 (3.9%). Liver diseases, burns and malaria were among the other aetiologies of death in the study. The leading factors contributing to mortality were identified to include: inadequate pre-hospital transfer (Ekere *et al.*, 2005; Siddiqui *et al.*, 2004). Limited hospital resources, poor

infrastructures on ground, delay in presentation and treatment absence of integrated and organised trauma care, lapses in inter-hospital communications, error in judgement and inadequate clinical exposure by the first line junior casualty officers in the accident and emergency department. We observed that no matter how adequate and efficient a hospital facility is, it can only be effectively utilized if it is accessible within a reasonable time. Increased journey distance to the hospital in the rural and sub-urban areas appears to be associated with increased risk of mortality. A 10 km increase in straight-line distance is associated with around a 1% increase in mortality. In Nigeria there is gross inadequacy of pre-hospital transportation and the ambulance system is almost none existent. As observed by Beckett *et al.* (1987) a survey such as this to identify deaths in A&E department is a simple form of audit of care given and care received by the most seriously ill patients. It allows comparisons to be made and identifies areas where improvements are desirable. A greater awareness of the problems in the running of A&E department and more aggressive approach to care and treatment is advocated. This will go a long way in improving the standard of care offered to the patients. Dearden and Rutherford (1985) stressed the importance of senior cover in the A&E department. In their study in Nottingham, all seriously injured patients are seen by a more experienced doctor, day and night, either in a supervisory role, or as the 'primary doctor'. They believe that this is in the best interest of patients but also the best method of teaching resuscitation technique to casualty officers. In as much as this suggestion is plausible our hospital cannot afford to post senior doctors in the A&E as there is paucity of specialists and doctors in this cadre.

CONCLUSION

The difficulties involved in delivery of care in the A&E are highlighted after review of mortalities. It is recommended that as a newly established health facility, there should be improvement in management techniques, provision of adequate facilities and standards of first line responders. The need for provision of continuous experienced senior casualty officers with rapid access to appropriate facilities is advocated as well as establishment of proper audit protocol. Effective and efficient pre-hospital transportation system no doubt should be put in place by the government in order to reduced access time to the hospital. This will contribute in reduction on mortality in the A&E.

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