

Surgical inpatient mortality in a Nigerian Tertiary Hospital

ON Ekeke, KE Okonta¹, PO Igwe¹

Department of Surgery, Division of Urology, University of Port Harcourt Teaching Hospital, ¹Department of Surgery, University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria

Abstract

Background: There is paucity of literatures on audit of mortality in the surgical units of tertiary hospitals in the country. This has made the spectrum of mortality not to been known in some of the centers and therefore, there is a great disparity and dearth in apportioning health care services appropriately.

Aim: The determination of the pattern of mortality in a surgical unit helps in planning, provision of quality surgical care and prioritizing of limited resources in developing countries.

Methods: This is a retrospective study of all patients who died during admission into surgical wards of our hospital between 2007 and 2012. Data on demography and events leading to death were collected and analyzed from all surgical wards, the emergency unit, surgical outpatients, and theater records.

Results: A total of 527 deaths occurred among the 8230 patients admitted during the 6-year period giving a mortality rate of 6.4%. Three hundred and forty-five (65.5%) were male, while 282 (34.5%) were females. The mortality rates in units were as follows: Burn and plastic (23.1%), general surgery (5.5%), neurosurgery (7.9%), urology (6.0%), orthopedics (3.8%), pediatric surgery (3.4%), and cardiothoracic surgery (11.9%). The yearly mortality rate were as follows, respectively: 2007 (7.1%), 2008 (6.0%), 2009 (4.5%), 2010 (6.5%), 2011 (7.2%), and 2012 (7.5%). About 84.6% of the patients died within 1 month on admission. The leading causes of mortality were trauma (41.8%) and cancer (32.4%). Most of the deaths (64.9%) occurred between 20- and 70-year-old.

Conclusion: Trauma and cancer constitute a great deal of health burden in our region. Strong legislation and screenings with timely interventions are required.

Key words: Cancer, surgical mortality, trauma

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Introduction

Despite the continuous improvement in the quality and scope of surgicare, deaths still occur.^[1,2] Surgical audit is

important in assessing the quality of care in any surgical unit. It also helps in appropriate allocation of resources in terms of manpower and equipment.^[1,2]

There is paucity of literature on surgical audit, especially related to the determinants of surgical mortalities in Nigerian hospitals. Previous in our institution were restricted to the accident and emergency surgical and medical units respectively.^[3,4]

Address for correspondence:

Dr. ON Ekeke,
Department of Surgery, Division of Urology, University of
Port Harcourt Teaching Hospital, P.O. Box 10697, Alakahia,
Port Harcourt, Nigeria.
E-mail: onfekeke@gmail.com

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This study aims to determine the pattern of mortality among patients admitted into the surgical wards of our hospital.

Methods

The records of the surgical mortality from January 2007 to December 2012 were retrospectively retrieved from the different surgical units monthly activity reports, death registry sheets, and death certificate of deceased patients while the records of surgical admissions for the same periods were retrieved from all surgical wards, the accident and emergency unit, surgical outpatients, and theater record book. Patients who died during the period of admission were identified. Information on demography, clinical diagnosis at time of death, immediate cause of deaths, duration of hospital stay, and year of death obtained and analyzed using computer based statistical software IBM SPSS Inc, Chicago, IL, USA, 2007, Version 16.0. The mortality rate was calculated as the percentage of death over admission. The results were presented as tables and charts.

Results

A total of 527 mortalities were recorded from the 8230 patients admitted during the 6-year period. Three hundred and forty-five fatalities (65.5%) were male whereas 182 (34.5%) were females giving a male to female ratio of 1.9:1.

More deaths were seen by the general surgeons 160 (30.4%) and burns and plastic surgeons 108 (20.5%) whereas urology unit and neurosurgery recorded 77 (14.6%) and 74 (14.0%) deaths, respectively. The relative percentage of death considering the admissions revealed more fatalities in burns and plastics unit (23.1%) and cardiothoracic unit (11.9%); then neurosurgery, urology, and general surgery in descending order of 7.9%, 6.9% and 5.4%, respectively. Mortality rates for orthopedics and pediatric surgery unit were 3.8% and 3.4%, respectively. This is shown in Table 1.

The trend of deaths showed yearly reduction from 2007 to 2009 and from then an increase in the incidence till 2012. The mortality rates as shown for the various years are shown in Figure 1 were as follows: For 2007 (7.1%), 2008 (6.0%), 2009 (4.5%), 2010 (6.5%), 2011 (7.2%), and 2012 (7.5%).

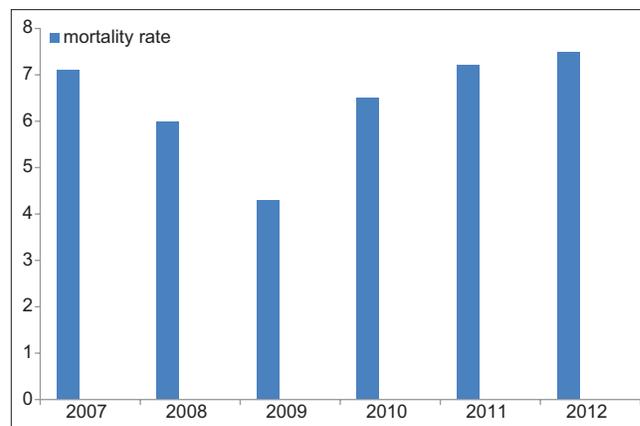


Figure 1: Yearly mortality trends

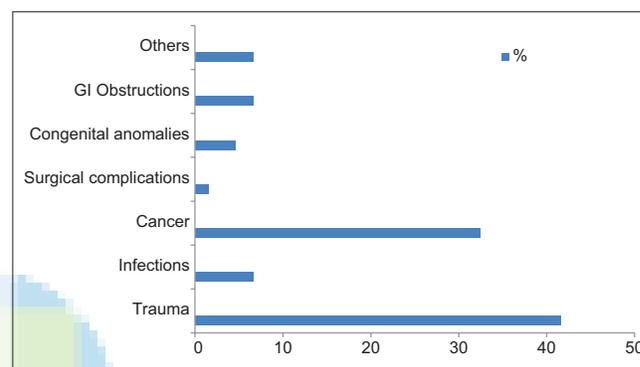


Figure 2: Primary cause of mortality

Table 2: The time between presentation to the hospital and death

Duration in days	Number of mortality recorded	Percentage of mortality recorded
0-28	446	84.6
29-56	49	9.3
57-84	19	3.6
85-112	6	1.1
113-140	1	0.2
141-168	2	0.4
169-196	1	0.2
197-224	-	-
225-252	1	0.2
253-280	2	0.4

Table 1: The mortality of Surgical units, admissions for each unit and the different percentages

Surgical units	Admission	% Admission	Mortality	Mortality rate	Proportionate mortality
Burns and plastics	467	5.7	108	23.1	20.5
Cardiothoracic surgery	84	1	10	11.9	1.9
General surgery	2927	35.6	160	5.5	30.4
Neurosurgery	936	11.4	74	7.9	14
Orthopaedics	1410	17.1	54	3.8	10.2
Paediatric surgery	1299	15.8	44	3.4	8.3
Urology	1107	13.5	77	6	14.6
All units	8230	100	527	6.4	14.6

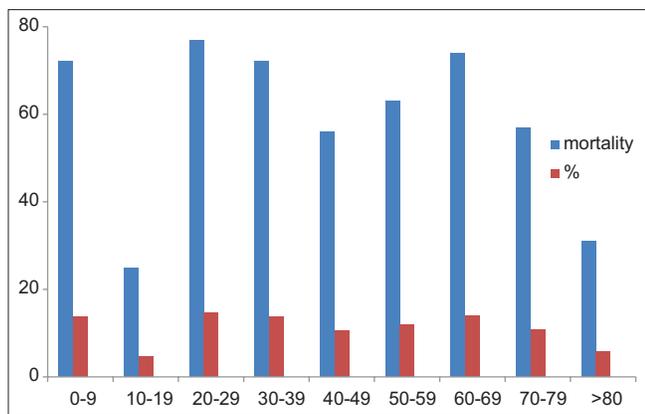


Figure 3: Age and percentage of mortality

About 84.6% of the patients died within 1 month on admission while <9.3% were admitted for <2 months [Table 2].

Two hundred and nineteen (41.6%) of these deaths were due to trauma cases only. One hundred and seventy-one (32.4%) were cancer-related deaths. The main cancers were those of the prostate, breasts, and colorectal carcinomas. Most of these cancers presented at advanced stages. Moreover, infections, gastrointestinal obstructions and others followed with same proportion 35 (6.6%) each. Congenital anomalies and surgical complications were 24 (4.6%) and 8 (1.5%), respectively [Figure 2]. The main congenital anomalies were hydrocephalus, meningomyelocele, pyloric stenosis, biliary atresia, and imperforate anus.

The presumed immediate causes of deaths were sepsis/septic shock in 179 (34.0%), metastasis 162 (30.7%), multiple organ dysfunction syndrome 104 (19.7%), and respiratory failure 60 (11.4%) whereas 15 (2.8%) died from acute renal failure. Others were hemorrhage 4 (0.8%) and chronic renal failure three deaths (0.4%).

The deaths were recorded more in age range of 20–29, 77 (14.6%), and 60–69, 74 (14%), respectively. Age group 0–9 and 30–39 both recorded 72 deaths each (13.7%) whereas 40–49 years recorded 56 deaths (10.6%) are shown in Figure 3.

Discussion

Mortality rate is the proportion of a population who die from any cause during a specified period of time. The rate can be made specific for a particular cause, or group of causes of death. The rate can also be calculated for each sex and for any age group, thus providing disease, sex, and age specific rates. The determination of the pattern of mortality in a surgical unit helps in planning and provision of quality surgical care,^[5] as well as to ensure the improvement in management techniques which might help to unravel the mysteries of death of unknown origin.^[3,5] It will also

enable us to know the changing pattern of mortality in the environment, and understanding of the severity of the diseases that present to surgical units.^[6] Mortality patterns can enable us embark on aggressive healthcare campaigns and education to improve the outcome of management.^[7] The quality of care in the surgical wards is an important index of ascertaining the optimum healthcare delivery pattern in a health institution.^[8] Some of the deaths in the operating room and surgical wards resulted from various factors including incompetence of the attending junior surgeon, delays in presentation of patients, and inadequate operating facilities and/or human resources.

The mortality rate of 6.4% from this review following surgical admission is currently on the high side especially when compared with a similar review in the hospital 8 years ago,^[3] though the patients who were admitted via the surgical outpatient for surgical interventions were not included in that study. In a similar study in Malaysia, Lim recorded a mortality rate of 2.6% in 1995. However, the mortality rate is similar to other findings in the Nigeria and outside the Nigeria.^[7,9] Biluts *et al.*, in a 5 years review in Ethiopia, recorded a 6.9% overall deaths among the admissions and 7.0% per surgical procedure.^[9] Moreover, mortality rate of 7.9% was recorded in Kano.^[10] Chukuezi and Nwosu 5 years review recorded a mortality of 419 per admission with a crude mortality rate of 9.14%.^[7] The observed high mortality rate in this study may be attributed to delayed presentation, severity of clinical conditions and logistics.

65.5% of the deaths were females. This is similar to the sex distribution of 63.1% males and 36.9% females reported in Ile Ife.^[11]

In a retrospective study done 4 years ago in Ile Ife, it was observed that trauma-related deaths were the leading cause of mortality in the surgical ward admissions and male patients at the prime of their lives were more often affected.^[12] From our study, trauma accounted for 41.6% of the deaths and was the leading cause of death. Our figure is similar to the 38.8% of deaths due to trauma in Sagamu.^[13] Trauma has also been recorded as the leading cause of deaths in surgical wards of Malaysia and Kenya.^[14,15] However, our result is contrary to the report from Owerri where acute abdomen was recorded as the leading cause of deaths in their surgical wards and not trauma.^[7]

Most of the trauma occurred as a result of road traffic accidents, burns, and urban civilian violence due to armed robbery and militancy activities. Understandably, most of these trauma-related deaths were also noted among the young and middle aged patients. This is the active age group in the population. Their high mobility exposed them to the risks of road traffic accidents and urban civilian violence which are the dominant factors in etiology of trauma in our environment.

Another finding was that a third of the mortality was recorded in the older and elderly patients. These age groups were equally saddled with a greater burden of malignancy. Moreover, most presented with advanced stages of cancer at diagnosis and have limited access to timely and standard treatment in our setting.^[16]

Cancer was the second most common primary cause of death from this review. Cancer has also been recorded as the second and third major causes of death in previous Nigeria and Malaysian studies, respectively.^[13,14] The main types of cancer were prostate, breast, and colorectal carcinoma.

A fifth of the whole mortality during the review was recorded in the children age group, especially neonatal period where congenital anomalies account for about 5% of the mortality recorded. The main congenital anomalies were hydrocephalus, meningomyelocele, pyloric stenosis, biliary atresia, and imperforate anus. Most of the deaths in these children occurred as a result of the severity of their anomalies.

Almost 85% of patient died within 28 days of presentation, this could be due to late presentation of cases in our environment^[16] as most of these patients presented at a different health center before they presented to our center. The severity of the case is also a factor that made the survival of these patients difficult. It is speculated that lot of patients only come to our hospital when their clinical conditions are very serious.

The mortality rate from the unit admission and the proportionate mortalities from the units for the burns and plastic patients were 23.1% and 20.5%, respectively; forming about one-fifth of all the deaths recorded. This is because most of these patients sustained major degree burn injuries from recurrent kerosene adulteration in the region during the period.^[17]

The cardiothoracic surgery unit had a low proportionate mortality and a high mortality rate from each admission because the patients' load was quite low and some of the trauma involved major cardiovascular structures which would require sophisticated and urgent evaluation with possible heart lung machine for surgical intervention. These facilities were not available in the hospital.

The general surgery unit on the other hand, recorded the highest number of deaths during the period but with one of the lowest risk of the patient dying in the hospital. Beside their patient load being the highest, the major injuries were abdominal trauma and gastrointestinal obstruction which were amenable to surgical interventions via laparotomy and appropriate surgical action. The spleen was the commonest

organ affected in blunt abdominal injury as has also been recorded elsewhere.^[18,19]

The neurosurgery unit also had high number of patients who sustained severe head injury from motorcycle accident. In our country, from a recent review, many motorcycle riders and their passengers do not wear helmets.^[20] The urology unit had high mortality rate as a result of high health burden occasioned by the number of the elderly patients who presented with prostate cancer.^[16,21]

The trend of death showed yearly reduction in mortality up to 2009 which could be attributed to ban of commercial motorcycle riders in our metropolis and decrease in the activities of militants in the region. Furthermore, the establishment of trauma unit with improved record keeping helped to capture all trauma cases from 2010 may have contributed to the apparent increase in mortality recorded between 2010 and 2012.

Conclusion

Trauma and cancer were the main reasons for mortality recorded in the surgical units of our hospital. There is the need to enforce legislations on safe driving methods, safe keeping of inflammable petroleum products, and ensuring improved security. Health care strategies toward cancer prevention and screening methods for early detection of cancers and appropriate treatment should also be encouraged.

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Conflicts of interest

There are no conflicts of interest.

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