

Epidemiology of non-trauma surgical deaths

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Summary

Background and objectives: It is established that 70 % of morbidity and 75 % of mortality in the surgical accident and emergency (A and E) are due to trauma. However, non-trauma deaths still are an important entity requiring a specific study to highlight their pattern, and institute improvement strategies to lower death rates.

Methodology: A retrospective analysis among non-trauma surgical deaths that occurred in the A and E Department of the University of Ilorin Teaching Hospital, Ilorin, Nigeria, over 24 months was done. Data collected included age, sex, interval between onset of illness and presentation, clinical features, occurrence of prior hospital visit, investigations done, cadre of surgeons that reviewed the patients and the interventions done as part of treatment before death.

Results: 4164 patients visited the A and E, 2916 (70 %) were trauma, 1251 (30 %) were non-trauma conditions. There were 171 deaths, 129 (75.4 %) were trauma deaths while 42 (24.6 %) were non-trauma deaths. Thirty (71.4 %) of the 42 had complete information for analysis. Age range was 2-95 years (mean 42.7 ± 21.8 years) comprising 18 males and 12 females. Patients with generalized peritonitis were in the majority 8 (26.7 %) comprising typhoid perforation 4, ruptured appendix 2 and perforated peptic ulcer 2. Terminal malignancies followed closely with 6 deaths (20.0 %), 3 from urological causes (2 prostatic and 1 bladder cancer), acute gastrointestinal bleeding 3 (10 %), intestinal obstruction 1 (3.3 %) and others. Nineteen patients (63.3 %) had visited a previous hospital where they had spent <48 hrs (4 patients), 48hrs -1 week (4 patients) and >1 week (2 patients), undocumented (9 patients). Less than 40% of the patients were able to do the requested investigations (electrolytes, X-rays and ultrasound) or got the desired interventions (blood and antibiotics)

Conclusion: Non-trauma deaths account for a quarter of the deaths in the A and E, generalised peritonitis and advanced malignancies were the main conditions responsible and characterized by late presentation, having spent a considerable time in a previous private hospitals.

Key-words: Epidemiology, Non-Trauma deaths Nigeria

Résumé

Introduction et objectif: On dirait que 70% de la morbidité et 75% de la mortalité dans le service des urgences (SU) sont attribuables au traumatisme. Toutefois, des morts à travers non traumatisme sont encore une entité importante qui demande une étude à part afin de souligner leur tendance, et établir des stratégies pour une amélioration afin d'abaisser le taux de mortalité.

Méthodologie: Une analyse rétrospective parmi des morts chirurgicales non traumatisme qui ont eu lieu dans le service des urgences au cours de 24 mois a été effectuée. La collecte de données compris âge, sexe, intervalle entre le début de la maladie et présentation, traits cliniques, la fréquence avant d'aller à l'hôpital, des investigations effectuées, le cadre des chirurgiens qui ont fait le bilan des patients et des interventions chirurgicales effectuées comme partie du traitement avant la mort.

Résultats: 4164 ont été inscrit dans le (SU), 2916 soit 70% étaient traumatisme, 1251 soit 30% étaient des conditions non-traumatisme. Il y avait 171 morts, 129 soit 75,4% étaient des morts à travers le traumatisme, tandis que 42 soit 24,6% étaient des morts non traumatismes. Trente soit 71,4% parmi les 42 avaient des informations complète pour l'analyse. Tranche d'âge était de 2 - 29 ans (moyen $42,7 \pm 21,8$ ans) comprend 18 du sexe masculin et 12 du sexe féminin. Des patients atteints de la péritonite généralisée étaient en majorité 8 soit 26,7% comprend 4 perforation typhoïde, 2 apper dicerupturé et 2 ulcère simple perforé. Des malignités terminales ont suivi de près avec 6 morts (20,0%). 3 à travers des causes urologiques, (2 prostatique et cancer de la vessie) saignant gastrointestinal aigu 3 soit 10%, obstruction intestinale 1 soit 3,3% et d'autres. Dix neuf patients soit 63,3% avaient visité l'hôpital précédemment avec un séjour < 48 heures (4 patients), 48 heures - 1 semaine (4 patients) et > 1 semaine (2 patients), sans documentation (9 patients). Moins de 40% de patients étaient capable de faire des investigations requises (électrolyte, radiographie et ultrason) ou reçu des interventions désirées (sang et antibiotiques).

Conclusion: Des morts à travers non traumatisme constituent le quart des morts dans le services des urgences, péritonite généralisée et malignité grave étaient les conditions principales responsable et caractérisé par présentation tardive après avoir passé une longue moment dans un hôpital privé précédent.

Introduction

Deaths in the Accident and Emergency room are not uncommon occurrences. We have provided data on these both as preliminary reports¹ and as a fuller documentation². Two major groups of deaths were identified in the A and E; those from trauma and non-trauma conditions. Whereas trauma deaths accounted for 75 % of A and E deaths, non-trauma deaths take up 25 %²⁻⁵. The pattern and distribution of trauma deaths mainly among victims of road traffic injury, falls and gunshot wounds who are in their third to fourth decades of life with urgent requirements of organized pre-hospital care necessary to present the patients in optimum physiologic state for treatment have been established in our

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environment³⁻⁶. Those of non-trauma victims present at variable age groups due to intraperitoneal sepsis and late malignancies where unsatisfactory inter-hospital referral system is implicated as some of the contributions to mortality. This study was done to report the different mechanism and circumstances of the non-trauma deaths using our hospital and range of clinical conditions seen.

Patients and methods

All patients admitted to the surgical section of the A and E ward of the University of Ilorin Teaching Hospital (UITH) Ilorin, Nigeria between September 1999 and December 2001 (excluding the period between September, 2000 and December, 2000 during which there was an industrial strike action by health workers in the country) had their data collected prospectively. Information obtained on the research register included name, age, sex, presenting diagnosis, prior hospital visit before presentation, the patient's outcome of care (if admitted, discharged, referred, or died). All the patients whose deaths were attributable to non-traumatic causes were extracted from this body of data and further analysed to show presenting clinical diagnoses, interval between onset of illness and presentation to the hospital. Data was also collected on the ancillary investigations requested and done as relevant to the diagnoses to determine the quality of care (full blood count, electrolytes and urea, plain radiographs and ultrasonography), cadre of attending surgeon or trainee(s) who saw the patients until death to determine the impact of expert opinion before death, duration of hospital stay to

determine time available for care, and probable clinical cause of death (autopsies were not routinely done due to some socio-cultural and religious restrictions). The results are presented using simple tables and Microsoft Excel Software.

Result

Of the 4,164 patients that were seen in the surgical section of the A and E ward of UITH during the period under review, 1251 (30.0%) of them were due to non-traumatic conditions. There were 171 deaths with 42 (24.6%) being due to non-traumatic causes. Thirty (71.4%) of these 42 deaths had sufficient clinical information for further comprehensive analysis. **Table 1** shows the spectrum of non-trauma clinical presentations seen and the mortality in the 30 patients, while **Figure 1** shows the distribution of the patients by age.

The age range was 2- 95 years (mean 42.7 years, standard deviation 21.7), 18 males and 12 females (M: F= 1.5:1). Table 1 also shows the priority of clinical conditions reporting to the A and E. Patients with generalized peritonitis were in the majority 8 (26.7%) comprising typhoid perforation 4, ruptured appendix 2 and perforated peptic ulcer 2. Malignancies of different parts of the body accounted for 6 deaths (20.0%). Interestingly, 3 of these were in the urogenital tract- 2 cases of prostatic carcinoma and one case of advanced bladder carcinoma. The others were one case each of colonic tumour presenting with intestinal obstruction, pancreatic tumour and osteogenic sarcoma. There were 3 cases of acute gastrointestinal haemorrhage (2 upper and 1 lower) and one other death from a benign intestinal obstruction secondary

Table 1 Non-trauma surgical conditions

Serial Number	Clinical condition	Morbidity (% n = 1251)	Mortality (% n = 30)
1.	Abscess (+ pyomyositis)	213 (17.0)	2 (6.7)
2.	Urinary retention	132 (10.6)	1 (3.3) renal failure
3.	Acute abdomen of unknown cause	117 (9.3)	2 (6.7) perforated ulcer
4.	"Others"	111 (8.9)	4 (13.3) unknown cause of death
5.	Appendicitis	101 (8.1)	2 (6.7) (ruptured)
6.	"Tumours"	97 (7.8)	6 (20)
7.	Intestinal obstruction	79 (6.3)	1 (3.3)
8.	Hernia / scrotal conditions	56 (4.5)	-
9.	Bleeding per rectum	51 (4.1)	1 (3.3)
10.	Medical disease referred	39 (3.1)	-
11.	Typhoid perforation	38 (3.0)	4 (13.3)
12.	Foot infection (non-trauma)	30 (2.4)	1 (3.3) (tetanus)
13.	Osteomyelitis	25 (2.0)	1 (3.3) septicaemia
14.	Testicular torsion/epididymoorchitis	24 (1.9)	-
15.	Extremity gangrene (non-traumatic)	23 (1.8)	1 (3.3)
16.	Epistaxis/ENT diseases	22 (1.8)	1 (3.3)
17.	Osteoarthritis	22 (1.8)	-
18.	Hand infection (non-traumatic)	20 (1.6)	-
19.	Post-operative complications	16 (1.3)	1 (3.3)
20.	Neck/back pain	13 (1.0)	-
21.	Oesophageal disease	12 (1.0)	-
22.	Haematemesis	10 (0.8)	2 (6.7)
	Total	1251	30

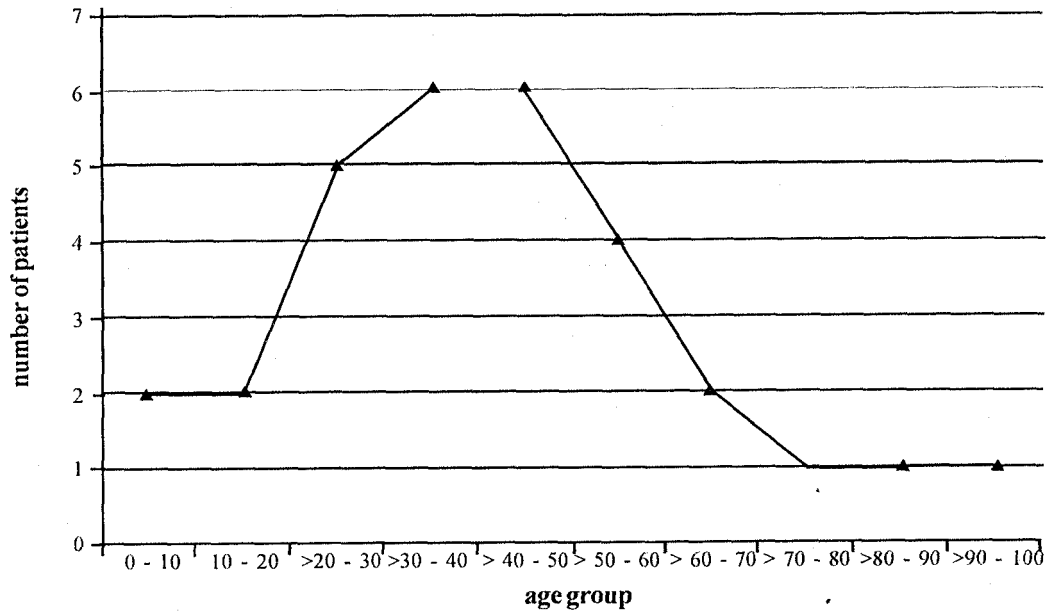


Fig. 1 Distribution of non-trauma surgical deaths

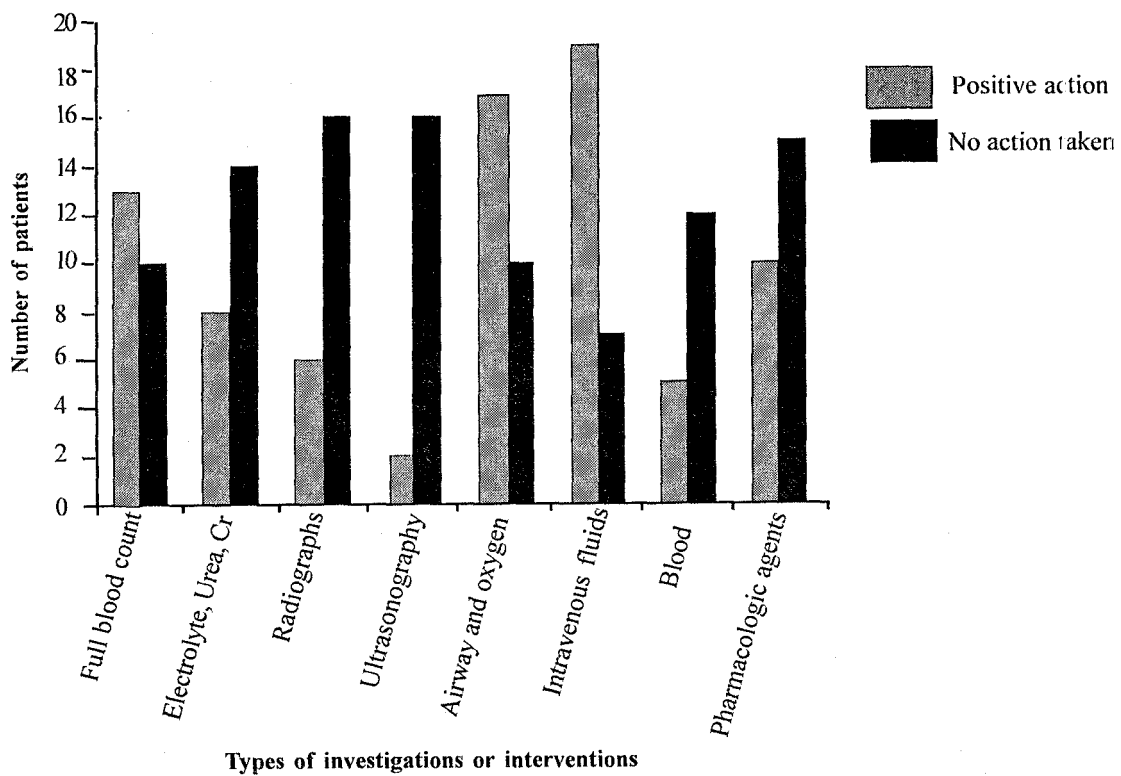


Fig. 2 Showing investigations and interventions on the patients before death

to adhesions. There were four deaths in which the diagnosis could not be ascertained. This was due to the rapidity of death before full clinical assessment could be done by the surgical registrar.

Concerning the cadre of medical staff that reviewed the patients on admission at the A and E, it was found that a

registrar(surgical trainee yet to pass the Part I examinations of the West African College of Surgeons or the Nigerian Postgraduate Medical College) alone reviewed 21 patients (70.0 %) without the benefit of senior opinion. Seven patients were availed of the full complement of medical staff, having being reviewed by a registrar, senior registrar and a

consultant. In 2 deaths, the cadre of doctors that reviewed the patients was not specified.

Some 19 patients (63.3%) had been to one private hospital where treatment had been received prior to presentation in UITH. Only one patient of the 30 was ascertained definitively not to have been to another hospital. In 9 patients, it was not specified if there had been any prior hospital visits before presentation.

Of the 19 patients that had previously visited private hospitals, the duration of stay in these hospitals could not be ascertained in 9 patients. In the remaining 10 patients, 4 had spent less than 48 hours, another 4 spent between 48 hours and a week, while 2 spent more than one week prior to presentation.

Within the UITH A and E, 8 (26.6%) of the dead patients spent less than 6 hours, while 16 (53.2%) patients spent between 6- 48 hours and 5 (16.6%) patients spent more than 48 hours in the hospital. Duration of hospital stay of one patient could not be ascertained from the records. The various investigations requested for the patients included full blood count (FBC), packed cell volume (PCV), electrolyte, urea and creatinine (E/U/Cr), radiographs and ultrasonography (USS). Of course, the peculiarity of each condition dictated the particular investigations done. Figure 2 shows the proportion of interventions intended and those who successfully had them and those who did not.

Discussion

This study has shown the spectrum of non-trauma surgical morbidity and mortality. Four conditions (acute abdomen of unknown cause, acute appendicitis, acute intestinal obstruction and typhoid perforation) representing non-trauma acute abdomen would account for the highest priority in the A and E as they were responsible for 335 patients (26.8 % of 1251) and 9 (30 %) of the 30 deaths (Table 1) Abscesses, urinary retention, advanced tumours and upper gastrointestinal bleeding were the next priorities (Table 1). Laboratory investigations (FBC, E/U/Cr, USS) and the blood bank became difficult in more than 60 % of the patients (Figure 2) on account of poor finances.

This study also reveals some other findings similar to trauma deaths. There is male preponderance as for trauma. The age group (Figure 1) is mostly among the income-generating 20-50 years age group as in trauma, too. Whether this is related to the shorter life expectancy in Nigeria (52 years in both males and females)⁷, the near-absence of such infective conditions in the developed countries has made comparison difficult unlike in trauma which is worldwide. Many researchers⁸⁻¹¹ have documented the measures to take in respect of typhoid perforation to reduce to the barest minimum its morbidity and mortality.

One of the factors identified for poor clinical work in the A and E was the level of competence of the attending surgical trainee who alone saw about 70 % of the patients whereas full complement of staff (from registrar to consultant) saw 23.3 % of the deaths. The contribution of this is difficult to prove but questions are already being raised at least in the United Kingdom for higher cadre of staff to man the emergency trauma facilities because a study revealed 8%

consultant review rate of trauma emergency patients¹².

The limitations of this study are as for retrospective analysis where poor documentation and missing data ensured only 71 % of the patients were fit for analysis. Even though quite representative, there is need to prospectively study the issues raised in this paper to ascertain greater accuracy from a study longer than two years that would generate a greater number of patients. However, the pattern of non-trauma deaths as shown in this paper should broaden the narrow statistics available on this subject.

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