Outcome Of Trauma Admissions In An Intensive Care Unit In The Niger Delta Region Of Nigeria

L Ebirim, S Ojum

Citation

Abstract
BACKGROUND Trauma, mostly from head injuries, has been found to be the leading cause of admissions in an intensive care unit (ICU) in Nigeria. The outcome of management of patients with trauma in the ICU at the University of Port Harcourt Teaching Hospital (UPTH) is not known. OBJECTIVE The aim of this audit was to determine the outcome of management for trauma patients admitted in the ICU at UPTH, and how it could be improved. METHODS All ICU admissions over a period of 4 years (February 2007-January 2011) at the UPTH were analyzed retrospectively. The proportion of these admissions that were due to trauma and the outcome were noted. Demographic details and other information were obtained from the admissions records of the patients and their case notes. RESULTS A total of 529 patients were admitted. Two hundred and fifty four (48.0%) were males, while 275 (52.0%) were females. Their ages were between 4 months and 82 years. Postsurgical patients contributed 226 (41.4%) of all admissions, while 132 (25%) of the admissions were for trauma cases. Other reasons for admission included medical conditions, 109 (20.6%), and burns, 62 (11.7%). The length of stay in the unit ranged from one day to fifty-three days, with a mean of approximately 10 days. A total of 217 (41.02%) patients died in the hospital. Fifty-three (40.2%), of the 132 trauma patients, died during admission in the ICU. Eighty-one (61.4%) of all trauma patients had head injury. Thirty-nine (48.1%), of all 81 head injury patients, died during admission. Thus, head injury was responsible for 39 (73.6%) of all 53 deaths caused by trauma. CONCLUSIONS Head injury was responsible for majority of the trauma admissions in the ICU. Mortality rate for trauma patients admitted in the ICU was very high. It was even higher for those patients admitted with head injury. Better therapeutic and monitoring equipment and further training of medical and nursing staff of the ICU are needed to reduce these high mortality rates. Also, improvement in the pre-hospital management of the trauma patient to prevent secondary brain injury can increase survival for head injured patients.

INTRODUCTION
The University of Port Harcourt Teaching Hospital (UPTH) is the major health care facility in the Niger Delta region of Nigeria. Admission of patients into the present intensive care unit at the hospital started in February 2007. Prior to this time, the hospital had an 8-bed high-dependency unit (HDU). Severely ill patients were treated there, but there were no mechanical ventilators or multi-parameter patient monitors as are available in the present ICU. The intensive care unit in UPTH has from its inception been staffed by the Department of Anaesthesiology and directed by a specialist Anaesthesiologist, who also had additional training in intensive care medicine. Patients are admitted in this general ICU if they have any of the diseases or conditions listed on the Diagnosis model of the Guidelines for ICU Admission, Discharge, and Triage, issued by the Society of Critical Care Medicine, and also if their medical conditions appear reversible with “reasonable prospect of substantial recovery”. Discharge from the ICU is done when the patient’s physiological status has stabilized and the need for ICU monitoring and care is no longer necessary.

A study at an ICU in Nigeria identified trauma as the leading cause for admissions and that head injury accounted for most of the trauma admissions.

This is the first study of the outcome for trauma patients admitted in this ICU, and the aim was to determine how often trauma is the cause of admissions in the ICU, the outcome of treatment for these patients and the aspects of intensive care that need to be improved upon for better outcome.

METHODODOLOGY
After obtaining institutional research ethical committee approval, this study was conducted retrospectively by reviewing the admissions records and case notes of patients
admitted to the 8-bed Intensive Care Unit in UPTH in the 4-year period (February 2007-January 2011).

The following demographic details and other information were gathered from patients’ records: Hospital number and names, Sex and age, Date of admission to Intensive Care Unit, Diagnosis necessitating ICU admission, Duration of admission, Subsequent fate of the patient and Date of discharge, referral or death.

RESULTS
There were a total of 529 admissions during the 4-year period studied. Two hundred and fifty-four (48%) were males and 275 (52%) were females. The ages of the patients ranged from 4 months to 82 years.

The pattern of admissions is shown in Table 1. Postoperative problems accounted for the highest number of admissions followed by trauma.

Table 2 shows the outcome of admissions for all the ICU patients. Out of the total number, 7 patients were referred to other hospitals. Three hundred and fifteen patients were discharged to the medical, surgical, gynaecological or postnatal wards. Two hundred and seven patients died during the course of admission.

Table 3 shows the types of Trauma cases admitted. The male: female ratio for trauma admissions was approximately 2:1. Most (61.4%) of the admitted trauma patients had head injuries. Multiple traumas was the second most common cause of ICU trauma admissions.

Table 4 shows the outcome of ICU admissions for Trauma patients. Seventy-seven of the 132 patients were either discharged home or transferred to the wards. Two patients were referred to other hospitals while 53 died during the course of admission.

<table>
<thead>
<tr>
<th>Category</th>
<th>Survival</th>
<th>Referred</th>
<th>Death</th>
<th>Total</th>
<th>Percentage Mortality</th>
</tr>
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<tbody>
<tr>
<td>Post-Operative</td>
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<td>-</td>
<td>65</td>
<td>226</td>
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<td>2</td>
<td>53</td>
<td>132</td>
<td>40.2</td>
</tr>
<tr>
<td>Medical</td>
<td>64</td>
<td>3</td>
<td>43</td>
<td>109</td>
<td>38.5</td>
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<tr>
<td>Burns</td>
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<td>2</td>
<td>47</td>
<td>62</td>
<td>75.8</td>
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<tr>
<td>Total</td>
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<td>7</td>
<td>109</td>
<td>519</td>
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<table>
<thead>
<tr>
<th>Sex</th>
<th>No.</th>
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</tr>
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<tbody>
<tr>
<td>Male</td>
<td>109</td>
<td>67.4</td>
</tr>
<tr>
<td>Female</td>
<td>43</td>
<td>32.6</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Category</th>
<th>No.</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Injury</td>
<td>81</td>
<td>61.4</td>
</tr>
<tr>
<td>Multiple Injury</td>
<td>19</td>
<td>14.4</td>
</tr>
<tr>
<td>Limb Fractures</td>
<td>15</td>
<td>11.4</td>
</tr>
<tr>
<td>Obstetric Injury</td>
<td>10</td>
<td>7.6</td>
</tr>
<tr>
<td>Spinal Injury</td>
<td>8</td>
<td>3.3</td>
</tr>
<tr>
<td>Intra-Abdominal Injury</td>
<td>3</td>
<td>2.2</td>
</tr>
<tr>
<td>Total</td>
<td>132</td>
<td>100</td>
</tr>
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</table>
DISCUSSION

Trauma was found in this study to be second only to postsurgical conditions as the leading cause of admissions in the ICU and was associated with a very high mortality rate. Head injury, which was found to be the most common form of trauma, had an even higher mortality rate. Fire outbreaks related to inappropriate access and storage of petroleum products accounted for most of the burns cases admitted during the period studied. Burns cases resulting mainly from this scenario accounted for only 11.7% of all admissions to the ICU but the mortality from this cause was as high as 75.8%. This was probably because most of the cases were of the type described as ‘horrendous burns injuries from fire outbreaks caused by adulterated fuels’. Two previous Nigerian studies from Lagos University Teaching Hospital (LUTH) and Jos University Teaching Hospital (JUTH) recorded no admissions for Burns in the ICU. However, a 4-year retrospective study at Ogun State University Teaching Hospital (OSUTH), showed that 14 (6.8%) of all the ICU admissions were for Burns and mortality rate for the affected patients was 35.7%. The mortality rate for burns patients admitted in the ICU at UPTH was more than twice that of OSUTH. Severity of burn injuries suffered by the UPTH patients may partly account for the big difference. However, level of equipment and expertise of staff of this ICU in the care of burns victims could also have contributed to the difference in outcomes.

One hundred and nine (20.6%) of all ICU admissions were for ‘Medical’ problems. Most of these patients had cardiovascular diseases such as cerebral vascular disease, myocardial infarction, heart block, angina pectoris and congestive cardiac failure. Other medical reasons for ICU admissions included: renal failure, liver failure, acute severe asthma, myasthenia gravis and tetanus. 14.5% of admissions to the ICU at OSUTH, were for medical problems while it was 19% in the Jos study.

The commonest reason (42.7%) for admission to the UPTH Intensive Care Unit was post-operative problems. Most of these patients had obstetrics and gynaecological surgeries due to disorders such as eclampsia, severe pre-eclampsia, severe ante partum haemorrhage, ruptured uterus and ruptured ectopic gestation. Some were admitted after neurosurgical procedures while a few were admitted following critical incidents during anaesthesia such as cardiac arrest. Fifty percent of the ICU admissions in JUTH were for postoperative problems and 57% of the paediatric ICU admissions in LUTH were also for postoperative problems largely from cardiothoracic operations. The ICU admission rate for postsurgical conditions at UPTH is probably similar to those of other centres in the country.

Trauma was the second most common reason for ICU admission in this study and was responsible for 53 (24.6%) of all the 207 deaths. Eighty-one of all the 132 patients admitted for Trauma had head injuries and 39 of them died in the ICU. Thus, head injury was responsible for most of the 53 deaths in the ICU due to Trauma. At OSUTH, head injury from trauma was the most common reason for ICU admission. Trauma was mostly due to road traffic accidents, which arose from irresponsible driving and poorly maintained roads and vehicles. Road traffic accidents are still an important public health problem in our environment. The essential elements of a pre-hospital trauma care system for victims of accidental injury include, prompt communication and activation of the system, timely response of the system, correct assessment and efficient treatment, and prompt transport of injured people to a formal health-care facility when necessary. When victims of trauma are cared for in this organized manner, mortality is reduced. One of the key principles in trauma patient management is that of the ‘golden hour’ or ‘golden period’. This period is defined as the immediate time after injury when resuscitation and stabilization will be most beneficial to the patient. As time passes following critical trauma, tissue hypoxia increases and the chance of survival or good post-survival prognosis decreases. In our environment, considerable delay occurs due to inadequate ambulance services. Initial consultations with alternative practitioners and the unique topography of the Niger Delta region, where some islands can only be reached in over 3 hours with speedboats, contribute to delays. As in some other parts of...

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**Table 4: Outcome of admissions in ICU for Trauma patients**

<table>
<thead>
<tr>
<th>Category</th>
<th>Survival</th>
<th>Referred</th>
<th>Death</th>
<th>Total</th>
<th>Percentage Mortality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Injury</td>
<td>11</td>
<td>1</td>
<td>39</td>
<td>51</td>
<td>48.1</td>
</tr>
<tr>
<td>Multiple Injury</td>
<td>13</td>
<td>6</td>
<td>19</td>
<td>38</td>
<td>31.6</td>
</tr>
<tr>
<td>Limb fractures</td>
<td>12</td>
<td>3</td>
<td>15</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>Chest Injury</td>
<td>7</td>
<td>3</td>
<td>10</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Spinal Injury</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>25</td>
</tr>
<tr>
<td>Intra-abdominal</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>33.3</td>
</tr>
<tr>
<td>Total</td>
<td>77</td>
<td>2</td>
<td>53</td>
<td>132</td>
<td></td>
</tr>
</tbody>
</table>
the developing world, injured people are usually cared for and transported to the hospital by relatives, untrained lay people or drivers of commercial vehicles. Training specific target groups, such as drivers of commercial vehicles, soldiers, policemen, high school students and volunteers can improve pre-hospital trauma care. Some studies in lower middle-income countries, especially in settings with high burden of injuries, have demonstrated the effectiveness of training lay-people in first aid.

Although there are facilities for suctioning, tracheal intubation, mechanical ventilation and patient monitoring, irregular supply of electricity and oxygen often hampers the use of these facilities. Facilities for arterial blood gas estimation when available, will improve the monitoring of the ICU patient, especially those on mechanical ventilation. Only a few of the nurses have ICU training. There is still a gross shortage of trained anaesthetists in the country, and more severe still is the shortage of trained intensive care physicians. The need to set up a local critical care medicine training program to produce intensive care physicians for the ICUs has been identified.

CONCLUSION

Survival rates of patients in our ICU are uncomfortably low. Mortality rates of patients admitted in the ICU for trauma, especially head injury are unacceptably high. Effective legislations and safety education for operators of motor vehicles can reduce the rate of road traffic accidents and the incidence of trauma. Training of lay people in first aid can improve pre-hospital care of trauma victims in the absence of formal emergency medical services. Provision of adequate pre-hospital care for trauma victims will minimize secondary injury and improve survival. Institution of safety measures should be complimented with satisfactory treatment facilities for victims. Improved equipment and better training of ICU personnel should be advocated.

References

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