

Timing of trauma deaths within UK hospitals.

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Summary

Trauma is a significant cause of death worldwide. We sought to investigate the temporal distribution of deaths following arrival in hospital with traumatic injury. This examination of 3632 deaths recorded on the largest European trauma database shows that the majority of trauma deaths occur soon after admission without further peaks in mortality. It does not support the presence of a trimodal distribution of deaths within the UK trauma population. It emphasises the need for the immediate involvement of the most experienced clinicians in the management of these patients.

Timing of trauma deaths within UK hospitals.

Trauma is the greatest single threat to life for children and young people in the U.K and reducing trauma mortality has been highlighted as a government priority. The Trauma Audit and Research Network (T.A.R.N.) was set up in response to the 1988 Royal College of Surgeons report highlighting deficiencies in trauma care¹. Analysis of T.A.R.N. data has already shown some reduction in the hospital case fatality rate following trauma over the last decade². However, in order to focus hospital resources to continue this improvement it is important to determine the temporal distribution of in-hospital trauma deaths.

The T.A.R.N database contains information on all severely injured patients who are admitted to participating hospitals for more than three days, die from their injuries, are transferred to or from another hospital, or are admitted to intensive care. Patients are followed until death, discharge or 93 days whichever is sooner. Consecutive cases were taken from the TARN database for the period from 1997 to 2001 inclusive. Data on the time interval between hospital admission and death were extracted and analysed.

Of the 66131 patients who were directly admitted to hospital following their injury (excludes inter-hospital transfers), 3,632 patients (5.5% (95% CI 5.3% to 5.7%)) died of median age 60.9 years of whom 59.6% (95% CI 58.0% to 61.2%) were males. Blunt injury accounted for most deaths with penetrating injury accounting for only 4.2% (95% CI 3.6% to 4.8%). Data on time of arrival and death were available for 2974 of the 3,632 in hospital deaths (81.9% 95% CI 80.6% to 83.1%). Most patients died shortly after admission (Figure): 26.1% died in the first 2½ hours (95% CI 24.5 to 27.7), 54.2% within the first 24 hours (95% CI 52.4% to 56.0%), and 73.5.0% within the first week (95% CI 71.9% to 75.1%). The figure was re-plotted using the full data supplemented with data from those patients with less accurate length of stay information (n=3614 deaths). The distribution of time to death was similar (results on request).

This analysis of the largest European trauma database shows that the majority of in hospital trauma deaths occur soon after admission without further peaks in mortality.

In 1983, Trunkey³ reported a tri-modal distribution of deaths with the immediate peak followed by early and late peaks at 2 hours and 3 to 4

weeks. This finding contributed to a change in trauma management. Emphasis has been placed on rapid assessment and treatment within the first (golden) hour following injury/arrival in hospital, with the aim of preventing later deaths from unrecognised injury or from complications. Expansion of consultant numbers within emergency departments has increased the seniority of physicians treating the severely injured in the UK². Evidence from the last ten years shows a reduction in the probability death following injury^{2,4}. Our data shows no late peak in mortality and that the trimodal distribution is not evident in the UK. This might be because treatment has improved and is now effective at preventing late deaths, or because the UK trauma population has never conformed to the three peaked model⁵.

Our study shows that the majority of in hospital deaths occur soon after admission on the first day. To achieve further declines in trauma mortality new initiatives need to focus on early events in the trauma patient's pathway.

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Time between admission and death in trauma patients



