International Journal of Surgery 6 (2008) 387–391

Contents lists available at ScienceDirect

International Journal of Surgery

journal homepage: www.theijs.com

Inter-hospital transfer of trauma patients in a developing country: A prospective descriptive study

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ARTICLE INFO

Article history:
Received 26 February 2008
Received in revised form 19 April 2008
Accepted 27 July 2008
Available online 5 August 2008

Keywords:
Trauma
Hospital transfer
Transfer protocol
Injury

ABSTRACT

There is no standardised protocol for the transfer of injured patients in Jamaica, a process that is well known to be potentially hazardous. We undertook this study to evaluate the inter-hospital transfer process of injured patients in this developing country.

Materials and methods: A prospective descriptive analytical study of all consecutive patients transferred to the University Hospital of the West Indies from other hospitals was conducted over six months. Data were collected on specially designed proformas and analysed using SPSS version 10.0.

Results: Of 122 patients studied, 79.5% were male and the mean age was 27.8 ± 20.7 years. Most injuries resulted from road traffic accidents (40.2%), falls (27.1%) and assaults (26.2%).

Several problems with the transfer process were identified. There was poor documentation of clinical parameters at referring institutions, with records of pulse rates in 13.1% (16/122), blood pressure in 9.8% (12/122), respiratory rate in 9.8% (12/122), Glasgow Coma Score in 10.6% (13/122) and pupillary reaction in 4.9% (6/122) of cases. Transfer arrangements were made by junior medical officers in 93.4% (114/122) of cases while consultants requested only 3.3% (4/122) of transfers. Public hospital ambulances transported 91.8% (112/122) of patients and 7.4% (9/122) were transported by helicopter. These vehicles were equipped with facilities for oxygen administration in 99.2% (121/122) of cases and sphygmomanometers in 91% (111/122) of cases, but functional capacity for suction was only present in 50% of vehicles. These critically ill patients were accompanied by physicians in only 11.5% (14/122) of cases, while 68.9% (84/122) were accompanied only by nurses.

Conclusions: The transfer of injured patients is not being performed in a manner consistent with modern medical practice. There is urgent need for implementation of a standardised protocol for the transfer of such patients in Jamaica.

1. Introduction

In 2006, the Caribbean Epidemiology Centre reported that 23% of emergency room visits in Caribbean countries were trauma related.[1] The incidence of trauma is particularly high in Jamaica, which has been reported to have the world's third highest homicide rate behind South Africa and Colombia.[2]

In Jamaica, trauma patients are managed at hospitals of varying categories throughout the island. Patients with complex injuries are usually transferred to one of two tertiary centres in Kingston, the capital city. The University Hospital of the West Indies (UHWI) is the only tertiary referral centre that provides emergent public access to investigation facilities, including computed tomography and magnetic resonance imaging. Many critically ill trauma patients are often transferred to the UHWI from other institutions island wide for investigation and management.

It is well known that inter-hospital patient transfer may be a hazardous process that exposes patients to numerous complications including hypoxia, hypotension, hypercarbia, convulsions, intracranial haematoma and neurological deterioration.[3–5] Most countries follow existing guidelines to govern the safe transportation of injured patients[6–8] but no such guidelines or referral systems exist in Jamaica, where trauma is a major public health problem.[9–11] This exposes residents[12] and visitors[13] to a potentially serious risk in the event of an injury requiring inter-hospital transfer.

Preliminary studies of the inter-hospital transfer of injured patients in Jamaica have suggested that the transfer process may be

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doi:10.1016/j.ijsu.2008.07.004

unsatisfactory.[12,14,15] The aim of this study was to identify the extent of the problem as it related to all patients with injuries transferred to the UHWI, and to make recommendations for improvement of the transfer process, if required.

2. Materials and methods

Trauma victims arriving at the UHWI usually presented to the Emergency Department. Emergency room residents immediately assess all incoming patients and commence resuscitation following Advanced Trauma Life Support protocols (ATLS) of the American College of Surgeons. Once the patients are stabilized, they are transferred to the care of the specialist surgical teams for investigations and definitive management.

We prospectively evaluated all consecutive trauma patients who were transferred to the UHWI for admission or investigations over six months from June 1, 2006 to December 30, 2006. A single investigator independently assessed all patients upon arrival in the Emergency Department to determine their clinical status and assess the Glasgow Coma Score (GCS). The investigator then evaluated the transfer vehicle and interviewed accompanying transfer personnel to record information on the clinical status of the patients during transfer, details of the transfer process, training of the transfer personnel, adequacy of the transfer vehicle and its outfitted monitoring equipment. Data communicated to the UHWI from the referring hospitals were also collected from the transfer records.

These data were recorded in a Microsoft Excel worksheet and analysed using the Statistical Package for the Social Sciences (SPSS) version 10.0.

3. Results

During the study period, there were 122 patients transfers to the UHWI. There were 97 males and 25 females with a mean age of 27.8 ± 20.7 years.

Most of the patients sustained unintentional injuries, with road traffic accidents (40.2%) being the most common injury mechanism. The injury distribution is outlined in Table 1 and the organ systems affected are detailed in Table 2.

The time of injury was documented in only 19 (15.6%) of cases and referral time in only 11 (9.0%) of cases by the referring hospitals. Arrival times of patients were evenly distributed over the 24 h day with approximately half the patients (56.6%) arriving between 6 p.m. and 6 a.m. There was no consistent or particular increase in patient flow on the weekends.

The level of documentation at the referral hospitals was generally sub-optimal. A comparison of the documented clinical parameters at the referral and receiving hospitals is presented in Fig. 1 and Table 3.

At the referring institution, only 16 patients had recorded pulse rates and 12 had recorded blood pressures. No patient was recorded to have a systolic blood pressure <90 mmHg or a diastolic blood pressure <60 mmHg. Pupil size or reaction was only recorded in 6 (4.9%) patients, two of whom had non-reactive pupils.

Table 1
Injury aetiology in transferred patients

Aetiology	*n* (%)
Intentional injuries	32 (26.2)
Blunt	14
Penetrating (knife)	13
Penetrating gunshot injury	5
Unintentional injuries	82 (67.2)
Motor vehicle accidents	49
Falls	33
Injuries not specified	8 (6.6)
Total	122

Table 2
Diagnoses of transferred patients

Diagnosis	*n* (%)
Head injury	89 (72.9)
Spinal injury	11 (9.0)
Abdominal injury	9 (7.4)
Chest injury	4 (3.3)
Long bone fractures	3 (2.5)
Major soft tissue injury/burns	3 (2.5)
Polytrauma (>2 vital system injuries)	3 (2.5)
Total	122

At the receiving institution, 50 patients were tachycardic with pulse rates >100 beats/min. Ten patients were hypotensive with systolic blood pressures <90 mmHg while diastolic readings <60 mmHg occurred in 5 cases. Of 107 patients who had recorded pupillary size and responses, 3 had unequal pupils and 3 had non-reactive pupils.

There was a marked difference in documentation of the GCS between the hospitals (Table 3). At the referring institution, 13 patients had documentation of the total GCS as well as the individual eye opening, motor and verbal scores while only a total score was recorded in the remaining 11 patients. At the UHWI, the GCS was recorded in 120 (98.4%) patients, with the individual component scores recorded in 110 cases. Thirty-five patients had a GCS ≤8 but only 19 (54.3%) of these patients had airway protection with endotracheal intubation.

The request for patient transfer was made by an attending/consultant grade staff in only 4/122 (3.3%) of cases and by junior medical officers in 114 (93.4%) cases. The status of the referring officer was unknown in four cases.

Most patients were transported by roadways using public hospital ambulances in 112/122 (91.8%) and a private ambulance in 1/122 (0.8%) case. Helicopters were utilized for transportation in 9 (7.4%) of cases. There were facilities to measure blood pressure and pulse rates in 112/113 (99.1%) ambulances, but automated monitoring devices to measure blood pressure, heart rate and pulse oximetry were only present in one ambulance, that was privately operated (Table 4). Functional facilities for suctioning were only present in 50% of the ambulances.

During transfer, 14/122 (11.5%) patients were accompanied by physicians, 100/122 (82%) were accompanied by nurses as the senior medical personnel and 8/122 (6.6%) were accompanied by non-medical personnel only (Table 5). There were 19 patients transferred during the study period who had an endotracheal tube in situ. Of these, 4 (21.1%) were accompanied by an anaesthetist, 6 (31.6%) by non-anaesthetic trained physicians, 8 (42.1%) by registered nurses and 1 (5.3%) by a trained intensive care nurse.

Intravenous access and infusions in progress were present in 121/122 (99.2%) transferred patients. The majority received physiological solutions but hypotonic Dextrose in water was given to five patients (Table 6). Urethral catheters were present in 43 patients. Less than half of those transferred (38/122, 31.1%) had cervical immobilization (Table 7). Twenty-seven of 49 patients (55.1%) with a history of a road traffic accident had no cervical immobilization. Nine of the 11 patients with spinal injury had a hard collar, one a soft collar and one a sandbag immobilization.

4. Discussion

It has been established that Jamaica has a trauma epidemic.[1,2,9,11] The problem has been worsening, particularly with