PREHOSPITAL CARE

Characterisation of patients treated at the Red Cross field hospital in Kashmir during the first three weeks of operation

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Objective: To evaluate the characteristics of patients treated at a field hospital in the first month after a major earthquake.

Methods: Age, sex, diagnosis, and operations performed on patients admitted to the field hospital of the International Committee of the Red Cross in Pakistani Kashmir between 21 October and 10 November 2005 were recorded and the data analysed.

Results: During the three week period of this study, 316 patients were treated at the hospital; 246 were women and children (77.9%). Two thirds were hospitalised, over 90% because of the need for surgery or surgical consultation. Altogether 345 operations were performed on 157 patients. The majority of patients had infected wounds with or without fractures.

Conclusions: Most patients need medical evaluation in consequence of earthquake-related trauma even weeks after the catastrophe, especially in areas difficult of access.

On 8 October 2005, the Kashmir area of Pakistan was struck by an earthquake measuring 7.6 on the Richter scale. The epicentre of the earthquake was located in Muzaffarabad, a city with over 500 000 inhabitants. It has been estimated that more than three million people in Pakistani Kashmir were affected by the disaster and over 80 000 killed.¹ Local health care was severely disrupted as several major hospitals were destroyed and health personnel killed or injured. On the request of the Pakistani government, the International Committee of the Red Cross (ICRC) sent a field hospital to Muzaffarabad on 11 October 2005.

In the present study we analysed the characteristics of the patients treated at the ICRC hospital during the first three weeks of its operation.

METHODS

The data analysed in the present study were collected between 21 October and 10 November 2005. All patients admitted to the emergency room and/or wards were registered, and their name, age, sex, and diagnosis recorded. The number of operations, type of operation, inpatient admissions, deaths, and discharges was recorded daily. For this analysis we divided the patients into nine diagnostic groups: fractures, wounds without fractures, acute abdomen, traumatic amputation, other surgical problem, lower respiratory tract infection/asthma, gastroenteritis, other infections, and other causes.

RESULTS

A total of 316 patients (mean age 22.7 (SD 19.5) years) making 320 emergency visits were treated at the ICRC hospital during the first three weeks of its operation (fig 1). Of these, 145 patients (45.9%) were children aged 14 years or under, and 101 were adult women (32.0%). The diagnostic grouping of the patients is shown in table 1. A total of 96 patients (30.4%) were discharged from emergency, 14 of these being transferred to other hospitals for further medical treatment (5 were transferred because they needed internal fixation; 2 because of diarrhoea and the lack of isolation facilities in the field hospital; 3 were in need of psychiatric

evaluation, and 1 patient each because of tetanus, malnutrition, labour, and congenital anal malformation). Four patients left against medical advice.

Two hundred and twenty patients (69.6%) were transferred from the emergency unit to hospital wards. Of these 34.5% were hospitalised with fracture(s) with or without wounds and 19.0% with wound(s) (table 1). Altogether 202 (91.8%) of the patients admitted were hospitalised because of need for surgical consultation/treatment. Of the 263 wounds and fractures recorded, 162 were in the lower (61.6%) and 64 in the upper (24.3%) extremities, and 20 in the head (7.6%); in 17 cases (6.5%) the location was not recorded or was elsewhere. Altogether, 345 operations were performed on 157 patients in the ICRC hospital during the three week period of this study. The mean number of operations per patient was three (range 1–8). The operative procedures carried out are shown in table 2. A total of 18 patients from the wards were referred to other hospitals for further treatment (13 needed orthopaedic surgery, and 1 each needed evaluation because of stab wounds, constant vomiting, tuberculosis, and heart and psychiatric problems). Six patients left the ward against medical advice. Two patients, hospitalised because of pelvic fracture and swollen leg, died unexpectedly.

DISCUSSION

During the past decade several major earthquakes have occurred: in Japan in 1995, Taiwan in 1999, Turkey in 1999, India in 2001, Iran in 2003, and the Indian Ocean in 2004.¹ It has been estimated that close to 500 000 people have died in earthquakes during the past six years.¹ Natural disasters not only cause loss of life, but also damage the infrastructure and the economic backbone of societies. In Kashmir, it has been estimated that 291 healthcare facilities were totally destroyed and 74 partially damaged from a total of 564 units functioning in the area before the disaster.² International organisations and the Pakistani government reacted to the earthquake by sending healthcare teams to the area and by 6

Abbreviation: ICRC, International Committee of the Red Cross

Figure 1 Hospitalised patients, outpatients, occupied beds, and surgical procedures performed at the International Committee of the Red Cross hospital during the first three weeks of operation.

November 2005, 16 field hospitals and 44 basic healthcare units had been registered in the area.³

On request from the ICRC, the emergency response units (ERU) of the Finnish and Norwegian Red Cross, including technical, logistic and healthcare personnel, set up the ICRC field hospital, which was operational on 21 October and functioned as a referral centre with 110 beds, including an intensive observation unit, an operation theatre, and emergency facilities. The medical personnel initially comprised Finnish and Norwegian professionals, including two surgeons, two anaesthetists, a general practitioner, a paediatrician, and registered nurses.

Ideally an ERU hospital should be operational within 48 hours after arrival. In Kashmir, however, practical obstacles made this impossible, delays being caused by a number of factors, including logistical problems such as difficulties in transport of hospital equipment. By the time the hospital commenced function two weeks had already passed. The most severely injured patients had died or been transferred to other hospitals. Four weeks after the earthquake, it was estimated that a total of 20 000 patients had

been transferred by helicopter to cities outside the affected area.³ However, more than 90% of patients treated at the ICRC hospital during the first three weeks still needed surgical treatment, the majority because of earthquake-related trauma. The constant influx of surgical patients can partly be explained by local geography. The area struck by the earthquake is extremely difficult to reach even in normal conditions. Because of road blockage/destruction caused by landslides many if not most patients in need of hospital treatment had to be transferred to Muzaffarabad by helicopter. Therefore, even weeks after the event trauma patients requiring surgery were found in the mountains.

Several predetermined factors also influenced the types of patient treated at the hospital. At the outset, strict admittance criteria were set by the hospital management to ensure the efficient functioning of the referral hospital. Because of shortage of personnel no isolation ward or delivery unit could be established. No patient with paraplegia or severe brain injury was accepted in view of their need for prolonged rehabilitation and the limited resources of the hospital. Traffic accidents, suicide attempts, stab and gun wounds had to be referred to Pakistani hospitals according to Kashmiri law. The level of hygiene at the hospital clearly dictated the types of surgery which could be performed. For example, internal fixation was not possible. Most of the procedures comprised cleaning of infected wounds with or without simultaneous fractures. The delay in the opening of the hospital, although fairly short, caused worsening of

Table 1 Diagnostic grouping of patients treated at the International Committee of the Red Cross hospital

Diagnostic group	Discharged from emergency n (%)	Hospitalised n (%)	Total n (%)
Fracture with/without wound	42 (43.8)	109 (49.5)	151 (47.8)
Wound without fracture	13 (13.5)	60 (27.3)	73 (23.1)
Acute abdomen	6 (6.3)	7 (3.2)	13 (4.1)
Traumatic amputation	1 (1.0)	8 (3.6)	9 (2.8)
Other surgical*	10 (10.4)	18 (8.2)	28 (8.9)
Lower respiratory tract infection/asthma	3 (3.1)	8 (3.6)	11 (3.5)
Gastroenteritis	7 (7.3)	4 (1.7)	11 (3.5)
Other infection†	6 (6.3)	2 (0.9)	8 (2.5)
Other‡	6 (6.3)	3 (1.4)	9 (2.8)
Not recorded	2 (2.0)	1 (0.5)	3 (1.0)
Total	96 (30.4)	220 (69.6)	316 (100)

*Suspicion of fracture (n = 11), abscess/haematoma (n = 7), hip dislocation (n = 4), congenital malformation (n = 2), burn (n = 3), pneumothorax (n = 1).

†Meningitis (n = 1), tonsillitis (n = 1), fever (n = 4), tetanus (n = 1), chicken pox (n = 1).

‡Labour (n = 1), miscarriage (n = 1), epilepsy (n = 1), angina pectoris (n = 1), malnutrition (n = 1), mental problems (n = 4).

Table 2 Procedures performed in the operation theatre at the International Committee of the Red Cross hospital

Procedure	No. (%)
Debridement of wound	142 (37.5)
Reposition/plaster of paris	50 (13.2)
Change of dressing	49 (12.9)
Delayed primary closure of wound	40 (10.6)
Traction	36 (9.5)
Skin graft	35 (9.2)
External fixation	7 (1.8)
Laparotomy	5 (1.3)
Others	14 (3.7)
Not recorded	1 (0.3)
Total	379 (100)

infection in open fractures and wounds, increasing the number of debridement procedures needed per patient and possibly the degree of permanent disability in some patients.

The constant influx of patients with wounds and fractures meant that the ICRC hospital was mainly occupied by surgical cases. In other natural disasters it has been shown that infectious diseases, and cardiac and psychiatric problems are common causes for hospitalisation.⁴⁻⁶ The number of patients needing hospital treatment because of non-surgical indications increased towards the end of the three week period. Crowded conditions in the tent villages in the city and surrounding areas caused an upsurge of diarrhoea and respiratory tract infections in the area.³ In addition, the approaching winter, with rainfall and cold nights, had already begun to worsen the health situation in the area, and during the subsequent weeks the patient case-mix was probably different.

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No ethical committee approval was required for collecting or publishing the data. The patient material was collected as part of the routine practice of the hospital. At the point of data analysis all personal identifiers were removed.

The approval of the International Committee of the Red Cross was obtained for publication.

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