

EXPERIENCE OF MAKESHIFT SPINAL CORD INJURY REHABILITATION CENTER ESTABLISHED AFTER THE 2005 EARTHQUAKE IN PAKISTAN

To the Editor:

Spinal cord injuries (SCIs) are frequently reported in earthquakes.¹⁻³ Pakistan is among 9 countries that account for more than 80% of earthquake-related injuries.⁴ An earthquake on October 8, 2005, in Kashmir, Pakistan, left more than 73,000 persons dead. This earthquake resulted in an estimated 650 to 750 SCIs.⁵ Management of SCI victims offered challenges such as saturation of available SCI rehabilitation services and aggravation of injuries by improper immobilization, lifting, and transport techniques.^{1,6-8} It was reported that several makeshift SCI rehabilitation centers, which were established after the earthquake, may have benefited these victims.⁹ However, structure, function, and outcome of these centers were never described.^{1,5,9}

In the district headquarter (DHQ) hospital, 93 SCI patients were admitted after the earthquake. Patients were mostly aged 16 to 39 years (63 [68%]) and were women (56 [60%]). The need for an SCI rehabilitation center was strongly felt when physicians from the department of medicine, who directly par-

ticipated in care of these patients in a makeshift arrangement, observed a high prevalence of pressure ulcers in the patients. After obtaining necessary authorizations, a makeshift SCI rehabilitation center was established in the DHQ hospital under the auspices of the department of medicine. This center remained functional from November 1, 2005, to April 30, 2006. A description of the care model implemented in this makeshift rehabilitation center compared with previous arrangements is given. The observations were made during a period from October 8 to December 24, 2005. The study was approved by the institutional review board of the Rawalpindi Medical College and the DHQ hospital.

It was observed that this care model improved the provision of health care resources to SCI patients compared with those previously available. Additional paramedical staff was recruited temporarily by the funds made available by different nongovernmental organizations (NGOs). The center was coordinated by a senior medical officer from the department of medicine. Visits of surgical, medical, and urological specialists were regular in contrast with previous arrangements whereby they were contacted only when a call was made by an attending physician (Table). All patients were systematically trained in bladder care. A physiotherapist from the Armed Forces Institute of Reha-

TABLE

Comparison of the Neurosurgical Ward and Spinal Cord Injury (SCI) Rehabilitation Center Established After the Earthquake in Pakistan in 2005

| | Before Rehabilitation Center | With Rehabilitation Center |
|----------------------------------|--------------------------------|----------------------------|
| Human resources | | |
| Neurosurgical consultants | 3 available 24 h | 3 available 24 h |
| Surgical consultants | On consultation | 1 available 24 h |
| Medical physician | On consultation | 1 available 24 h |
| Urologist | On consultation | Twice-weekly visits |
| Rehabilitation specialist | None | Twice-weekly visits |
| Nutritionist | None | Weekly visits |
| Psychologist | None | Daily visits |
| Social workers | None | Daily visits |
| Coordinator | None | Available 24 h |
| Residents | 2 available 24 h | 2 available 24 h |
| Interns | 2 available 24 h | 2 available 24 h |
| Nurses | 2 available 24 h | 3 available 24 h |
| Dressers | 1 available 6 h | 1 available 24 h |
| Ward servants | 1 available 24 h | 2 available 24 h |
| Sweepers | 1 available 24 h (undedicated) | 1 available 24 h |
| Physiotherapists | 1 available 6 h | 3 available 6 h |
| Physiotherapist assistants | None | 15 available 12 h |
| Physical resources | | |
| Beds | 70 | 90 |
| Rehabilitation gym | None | Available |
| Wheelchairs | 2 available for all patients | Available for each patient |
| Crutches/corsets | None | Available for each patient |
| Miscellaneous | | |
| Regular rehabilitation exercises | None | Daily for each patient |
| Psychological counseling | None | 30 min daily per patient |
| Meals | None | High protein 3 times daily |

bilitation Medicine and the NGO Handicap International regularly visited and trained volunteers in rehabilitation exercises. Furthermore, SCI victims were assessed regularly by visiting psychologists and nutritionists.

Physical resources such as specialized beds, wheelchairs, and crutches were provided to all patients, which was not the case before. A rehabilitation gym was established within the ward in which regular rehabilitation exercises were carried out. Moreover, protein meals were provided to all patients 3 times a day. Funding for all of these additional resources was provided by NGOs.

Daily progress of all SCI victims was collected in this center by medical residents. More than two thirds of the patients (65 [70%]) had surgical interventions (spinal fixation), whereas the others (28 [30%]) were managed conservatively. Prognosis of SCI was measured daily from admission to discharge by a consultant physician using the American Spinal Injury Association impairment score.¹⁰ During the period from November 1 to December 24, 2005, an improvement in injury score was observed in 36 of 93 patients. In 14 patients, pressure ulcers developed, only 1 was grade 4. One patient had deep venous thrombosis, whereas the single death that occurred in the defined period was due to pulmonary embolism.

In this care model, coordination among the different services was an important element. Direct involvement of a member of the department of medicine as the coordinator was paradoxical because patients were admitted primarily because of surgical conditions. However, resource limitation in such an extraordinary situation was the major reason for these arrangements. Our experience showed that this may have benefited victims and the health care system in following ways: (1) relieving surgeons to take care of patients with other types of injuries and (2) identification of medical conditions that are frequently fatal in patients with SCIs, such as pneumonia, respiratory problems (atelectasis), heart disease, subsequent trauma, septicemia, and deep venous thrombosis.¹¹

It is possible that regular visits of surgical specialists might have prevented emergent surgical conditions such as pressure ulcers, wound infections, and urinary tract infections in SCI patients.^{12,13} However, it is difficult to draw such conclusions on the basis of available data. Nevertheless, establishment of this center provided a forum for offering rehabilitation services in a resource-poor setting.¹⁴ Indeed, this center facilitated engaging volunteers to care for patients and procuring required rehabilitation material from NGOs. Similarly, psychological and social services, which are essential in SCI rehabilitation, were provided to patients under the auspices of this center.¹⁵

These observations showed that necessary arrangements could be made to meet the needs of an overwhelming number of SCI patients. Several lessons can be learned from implementation of this care model. When SCI rehabilitation centers become saturated after such disasters, it might be useful to consider es-

tablishing makeshift rehabilitation centers. Furthermore, it is appropriate to establish such centers in the nearest available tertiary care centers. Finally, a coordinating body is necessary to ensure timely availability of multiple health care services.

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Acknowledgments: We thank Asif Raza Bhatti, MBBS, Naheela Afzal, MBBS, Raheel Rabbani, MBBS, Sher Bahadur Khan, MBBS, Arshad Iqbal Satti, MBBS, FCPS, Sister Tasneem, Sister Razia, Sister Jabeen, Sister Fozia, Sister Raffat, Sister Sofia, Mr Arshad, Mr Shabbir, Mr Abid, Mr Akhter, all from the DHQ Teaching Hospital, Rawalpindi and Armed Forces Institute of Rehabilitation Medicine, Handicap International, for help at various stages in compilation of this study.

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