Earthquakes and Rehabilitation Needs: Experiences From Bam, Iran

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Abstract

Background: In December 2003, a devastating earthquake destroyed Bam and surrounding areas in Iran, leaving many people with residual deficits and disabilities, of which approximately 240 patients had spinal cord injury (SCI).

Methods: As an independent volunteer working in outpatient clinics, I visited the patients as part of a mobile team and set up a short educational course in spinal cord medicine.

Results: I visited 34 patients with SCI in the first 3 months. Eight months after the disaster, I visited 54 patients with SCI, 29 female (53.7%) and 25 male (46.3%). Postdisaster problems were identified, including need for accurate data collection, identification of patients' conditions, attention paid to psychosocial issues, ethical dilemmas, and research needs.

Conclusion: Disaster preparedness for earthquakes should include first aid and injury prevention, coordination of relief efforts, basic education and medical care, and short-and long-term rehabilitation needs. The major focus of rehabilitation medicine specialists' should be education of the general and professional population toward integrating the concept of rehabilitation.

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Key Words: Rehabilitation; Spinal cord injuries; Disaster preparedness; Earthquake; Iran

INTRODUCTION

On December 26, 2003, at 5:26 AM (local time), a 12-second earthquake presented the 100,000 people of Bam, Iran, with at least 36,000 dead and 23,000 injured. Approximately 10,000 people were admitted to temporary, local, or other hospitals in the country. The disaster left a great many people with residual deficits and disabilities. Five months later, another earthquake destroyed homes and left several dead in the north of Iran and was so severe that it caused panic in Teheran. Iran is located over many earthquake faults, and unfortunately these recent quakes will not be the last. There has been an international response to these disasters involving many kinds of specialists. But where is the place of rehabilitation in such disasters?

Starting on the 28th day after the disaster, I served in Bam intermittently as an independent volunteer for approximately 3 months, working in outpatient clinics, visiting the patients as part of a mobile team, and setting up a short educational course in spinal cord medicine. Initially, I visited 34 patients with spinal cord injury (SCI).

Eight months later, I returned to visit patients with SCI living in the area. During a 2-week period, we identified 54 patients, 29 female (53.7%) and 25 male (46.3%).

DATA COLLECTION

Even several months after the earthquake, the exact number of people with disabilities, including SCI, due to the earthquake was not completely clear. One of the most important problems, especially in the first months after the disaster, was lack of sufficient data. There was a lack of organized effort for gathering data by governmental organizations and a lack of coordination with the separate efforts of nongovernmental organizations (NGOs). Additionally, in the first months after the disaster, patient identification and data collection were hindered by the dispersion of the people of Bam to other areas of the country, lack of expert personnel, loss of pre-existing data during the earthquake, frequent relocation of the people, and loss of addresses and maps due to destruction of the city. Many local physicians and managers also died, and nearly all of those who remained had problems with loss of family, friends, and property. This, along with the destruction of the hospitals, made the management of the disaster even more complex.

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Approximately 100 individuals with SCI were identified in Bam and the surrounding area; they lived in tents and temporary houses during the first months after the disaster. Fortunately, nearly all of the patients had received some kind of permanent shelter by the time of my return visit 8 months after the earthquake. Of many problems faced by the authorities in gathering data, lack of expertise and knowledge resulted in some patients with peripheral nerve injuries or plexopathies being considered to have SCI, and some of the individuals with SCI were underdiagnosed or not identified. The demographic distribution of the disaster patients differed from the 4:1 male to female ratio in the literature (1, 2). Noteworthy in this case was that approximately half of patients were women and some were pregnant. Some of the patients were children as young as 1.5 years. This demographic distribution must be considered in short- and long-term planning. For example, one of the important needs of the female patients during the first months after the disaster was birth control measures, because most of them were not aware of the risk of pregnancy.

In addition, there were patients, unidentified by governmental agencies or NGOs, who had received improper care by their families because they did not know where they could refer the patients. It appears that one of the first steps in implementing a rehabilitation program is gathering enough information. The lack of information resulted in the neglect of some disabled patients and inappropriate distribution of equipment. In fact, medical aid in many previous disasters has been well intentioned but poorly organized and with limited benefits (3). Key health decisions made during emergencies are often based on insufficient, nonexistent, or even false information, which results in inappropriate, insufficient, or unnecessary health aid, waste of health resources, or counter-effective measures (4). The rehabilitation process in Bam, although a long-term process, has suffered from these problems as well. On the other hand, because rehabilitation is a long-term process and the experience of the developing countries in rehabilitation is usually limited, international aid from the field of rehabilitation, if well organized, would be of great help in disaster areas.

Patient Conditions

Some NGOs without any previous experience were working with disabled patients. In general, NGOs lack information and resources that are not specific to their mission and may lack a holistic approach. For example, although there were some facilities for physical therapy, of the 34 patients visited during the first months after the disaster, only 3 had received education regarding bladder care and only 1 had received education regarding bowel care. Many patients had pain syndromes, but there was little attention to pain management. Sometimes, a high-technology wheelchair sat beside the person's tent, rendered useless due to problems with maintenance and repair. Durability and maintenance accessibility must

be considered in providing wheelchairs or assistive devices in the disaster area. Application of traditional technology usually has better long-term results than introducing a new approach with poor follow up.

During the summer, the climate is very hot, but there was little knowledge of the effects of heat on persons with SCI, including thermoregulatory problems (5). Appropriate housing should be regarded as a necessary therapeutic device. In addition, access to facilities distributed for the general population, including air conditioning devices, was lower for those with disabilities than for able-bodied people.

Transportation was another major problem, particularly for individuals with SCI needing access to rehabilitation services. Although a few mobile teams consisting of a physiotherapist and sometimes an occupational therapist were partly effective, the medical and nursing problems of these patients remained largely untreated. An outreach-based, rehabilitation-type "Safari Program" (6), if well organized, could be a good choice shortly after the disaster and for long-term follow up. In this model, the rehabilitation team visits the patients in their homes in the community (6).

Earthquake-related SCI are often due to objects or ceilings falling on individuals who are in upright and sitting positions (7,8). It has also been suggested that among patients with cervical spine injury, a delayed or missed diagnosis was associated with 10 times the incidence of permanent neurological sequelae (9). In Bam, it was difficult to determine the exact mechanism of the SCI. A verbatim report collected from the patients suggests that certain factors may have contributed to the high number of SCI and nerve injuries, such as occurrence of the earthquake in the early morning hours when most of the people were sleeping on the ground; the vulnerable construction material consisting mostly of mud bricks; the manner in which the patients were rescued from the rubble, especially dragging them; and the ways they were subsequently transported.

Most of the long-term survivors have a low neurological level of injury. Probably some of the patients with high neurological level of injury have died from complications. Patients with pressure ulcers were usually transferred to other hospitals in the province for management, so the number of patients with high-grade pressure ulcers living in Bam was not very high. Some of the patients could become ambulatory with proper rehabilitation. An international NGO has given a short educational course on SCI for physical therapists, but much more needs to be done. Misinformation also impeded rehabilitation efforts. A large number of NGOs and volunteer visitors in the first months gave false hopes for complete cure, so many patients with SCI did not see the need to participate in rehabilitation programs. Even 8 months after the disaster, many patients, mostly males, were waiting for complete cure without active participation in rehabilitation programs.

Cultural beliefs about people with disabilities were also an important issue. Some patients, especially women, were obliged to become independent to handle their families, but in general, dependence on others is an expected consequence of disability; many patients, especially men, became completely dependent on the family. Although some of the patients received physical therapy, it was often concentrated on electrotherapy and not on functional activities or the prevention of complications. This inappropriate setting of priorities of care needs to be changed at the national level. Many patients were using physical therapy without any clear indications for outcome, which made “habitual physical therapy” another problem. As time passes without any intervention, the opportunities for a good outcome of rehabilitation decrease. Time is a great consideration in implementing a rehabilitation program (10), and this is overlooked in many disaster management activities.

Psychosocial Issues

The success of individual rehabilitation depends heavily on how well the person reintegrates into society. Reintegration is dependent partly on the adequacy of the physical rehabilitation and partly on the patients and their support system (11). Although many patients, especially women, participated actively in their family mostly due to their feeling of responsibility and fear of separation from their husbands, there was little to facilitate their broader reintegration into society. Many patients in care centers complained of the lack of facilities for social activities.

In developing countries, the disabled are not usually rejected from the family and community (12,13), but on the other hand, independence is not a general goal of rehabilitation (14). The psychological impact of disasters extends beyond dealing with death and disability, and the barriers to rehabilitation are many. Massive disasters leave deep scars on the local community, and the people with disabilities are often faced with losing their homes and properties, in addition to some of their abilities. There is a great need for broad psychological support, and even the simple presence of the knowledgeable professional gives the people hope and courage.

Rehabilitation can only be effective if properly combined with social, cultural, religious, and economic considerations. Ignorance of such regional factors will result in improper, insufficient, or needless health aid, wasted resources, and sometimes even harmful measures. Presenting different professional viewpoints can be useful, but lack of familiarity with cultural aspects and the inability to effectively communicate with the patients were two major problems with the temporary personnel who assisted in the region. Educating local personnel to provide rehabilitation services would result in better, faster care at lower costs and for longer terms. Because rehabilitation is deeply related to the patient’s everyday life and culture, even local personnel are much more effective than the staff recruited from other parts of the country.

Ethical and Research Issues

Ethical dilemmas are frequently encountered during disaster management, and the rehabilitation process is not an exception. In fact, the most difficult aspect of working in the area was the ethical problems encountered. Challenges associated with allocating facilities and resources to people with different kinds of disabilities and rehabilitation needs in the face of time, personnel, and equipment shortages presented everyone with ethical dilemmas without the benefit of training and guidance in how to make decisions in disaster situations. It seems that a guideline must be developed by disaster management experts that can be used in decision making during these situations.

Even in a disaster situation, research is needed for proper decision making and to gain experience for future aid (15). Results of disaster research provide informed advice about the probable health effects of future disasters, establish priorities for action by emergency medical services, and emphasize the need for accurate information as the basis for relief management decisions (16). Lack of time, personnel, and equipment, on the other hand, makes research during a disaster difficult to conduct. The research we performed on SCI patients 8 months after the disaster involved concurrent data collection and patient education and addressed the educational needs of the staff of community-based rehabilitation programs.

Education

The large number of affected patients obliged us to deliver some part of the responsibility of management to patients’ families and other health care workers. Even brief education regarding essential needs and problems delivered to patients in physical therapy clinics and also in tents and temporary houses can be helpful. Patients, especially some of the women, were very avid in learning about their disabilities. This encouraged me to prepare booklets for people with SCI and those with limb amputations. Because there was no rehabilitation nursing education and general practitioners lacked familiarity with disabilities, I decided to set up an educational program on SCI. Although it was only 3 days long and there was little access to educational equipment, it was useful, as the results showed several months later. I focused on training local providers, because NGOs and other volunteer persons eventually leave. One major problem was lack of audiovisual educational material for patients and even health care workers.

The first hours after the disaster are the most important time for rescue of the casualties (17–20), and outside medical assistance usually arrives too late for immediate care, that is, after local health services have already provided emergency medical assistance (21). Some studies suggest that initial emergency medical needs are best met by local providers (22).

Each disaster is an opportunity to learn how to face future inevitable disasters (23–25). It also magnifies the health problems of the community that may not have been considered seriously under usual conditions. Considering the potential frequency of disasters and the large numbers of disabled, it appears that the rehabilitation specialists' major responsibility is to focus on education at different levels in the general and professional population and on the establishment of links with other specialty groups for developing the concept of rehabilitation.

The general population, especially in high-risk regions, must be trained in first aid, including the proper techniques for extricating and handling patients for prevention of further disabilities (eg, SCI). Organizations that have direct responsibility in such conditions must also train their personnel in the measures of disability prevention and managing disabled persons. The nurses and general practitioners must also be familiar with not only emergency interventions but also long-term management of disabilities. Because the number of disabled patients is high, there is a need for general practitioners who work in the region to be trained in such subjects as SCI medicine.

CONCLUSION

The World Health Organization defines *disaster* as a sudden ecologic phenomenon of sufficient magnitude to require external assistance (3,26). Regardless of an area's level of preparedness, natural disasters should always be expected (27), and some disasters result in many casualties in need of rehabilitation (7,17). The very large number of people with disabilities resulting from disasters demonstrates the need for greater focus on the international role of rehabilitation medicine in disaster situations.

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