

Original article

The lack of antiepileptic drugs and worsening of seizures among physically handicapped patients with epilepsy during the Great East Japan Earthquake

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Received 25 January 2015; received in revised form 15 January 2016; accepted 15 January 2016

Abstract

Background: Takuto Rehabilitation Center for Children is located in Sendai, the capital of the Miyagi prefecture, and faces the Pacific Ocean. The tsunami caused by the Great East Japan Earthquake resulted in tremendous damage to this region. Many physically handicapped patients with epilepsy who are treated at our hospital could not obtain medicine. We surveyed patients with epilepsy, using a questionnaire to identify the problems during the acute phase of the Great East Japan Earthquake.

Methods: After the earthquake, we mailed questionnaires to physically handicapped patients with epilepsy who are treated and prescribed medications at our hospital, or to their parents.

Results: A total of 161 respondents completed the questionnaire. Overall, 68.4% of patients had seven days or less of stockpiled medication when the earthquake initially struck, and 28.6% of patients had no medication or almost no medication during the acute phase after the earthquake. Six patients were forced to stop taking their medication and nine patients experienced a worsening of seizures. Most (93.6%) patients stated they require a stockpile of medication for more than seven days: 20 months after the earthquake, 76.9% patients a supply of drugs for more than seven days.

Conclusions: We suggest that physically handicapped patients with epilepsy are recommended to prepare for natural disasters by stockpiling additional medication. Even if the stock of antiepileptic drugs is sufficient, stress could cause worsening of seizures. Specialized support is required after a disaster among physically handicapped patients with epilepsy.

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Keywords: The Great East Japan Earthquake; Physically handicapped patients; Severe motor and intellectual disabilities; Epilepsy

1. Introduction

On March 11, 2011, the Great East Japan Earthquake and the subsequent tsunami brought tremendous devastation to a large area. The disaster left more than 18,000 people dead or missing [1], caused significant damage and hardship, and increased the demand for drugs immediately following the earthquake. Takuto

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Rehabilitation Center for Children, located in Sendai, the capital of the Miyagi prefecture, serves 2,000,000 residents. The Miyagi prefecture is located along the Pacific Ocean and suffered severe damage following the earthquake and tsunami. Our hospital is the primary rehabilitation center for children in the community and for continuation of care into adulthood. Furthermore, patients treated in our hospital come from neighboring prefectures including Iwate, and Yamagata. Our 279 patients with epilepsy and associated motor and/or intellectual disabilities are prescribed medication at our hospital. During the disaster, an inadequate supply of electricity, water, gas, and telecommunication services paralyzed the region around our hospital. Before the disaster occurred, more than half of our patients obtained their prescription from the in-hospital pharmacy. Many patients experienced a shortage of medication due to inability to access our hospital, which is located about 20 km from the center of Sendai. Telecommunications were restored after approximately five days. After the earthquake, the Ministry of Health, Labor and Welfare stated that patients with chronic disease could obtain any regular medicines without prescriptions at their local pharmacy under the condition that the patient is stable and the prescription could be confirmed based on a medical notebook [2]. After this announcement was made, we announced on the hospital's website that patients or their family could obtain medicine from a pharmacy without a prescription. However, some patients were unable to access antiepileptic drugs because they were unfamiliar with their prescription or lacked access to any local hospital or pharmacy. Recent research has reported that the frequency of seizures among epileptic patients increased following the Great East Japan Earthquake [3]. We surveyed physically handicapped patients with epilepsy about the acute phase of the Great East Japan Earthquake, using a questionnaire to identify problems during the acute phase.

2. Methods

2.1. Participants

Prior to the earthquake, our hospital treated and prescribed medication to 279 physically handicapped patients with epilepsy. Of these, 132 patients (47.3%) were severe motor and intellectual disabilities, which was defined as an intelligence quotient (IQ) of less than 35 and the inability to walk. Ten months after the earthquake, we sent questionnaires to the homes of the physically handicapped patients except for severe motor and intellectual disabilities. Twenty months after the earthquake, we sent the same questionnaire to the severe motor and intellectual disabilities. One patient died of drowning. We

declined to send a questionnaire to this patient's family.

2.2. Questionnaire

The survey consisted of the following questions (Fig. 2): Q1. How many days of antiepileptic drugs remained when the earthquake occurred? Q2. Before the earthquake, where had the patient been obtaining his/her medicine: an in-hospital pharmacy or a pharmacy outside the hospital? Q3. Did the patient have sufficient medicine during the acute phase of the disaster after the earthquake? If a patient had insufficient, he/she was asked to answer the following questions (Q4 and Q5). Q4. Could the patient contact us during the acute phase after the earthquake? Q5. Where did the patient obtain medication: at our hospital, nearby hospital, nearby pharmacy, or discontinued. If the patient obtained medications at another hospital or pharmacy, additional questions were asked such as whether the hospital or pharmacy was a primary care hospital or community pharmacy, and whether this was their first visit to that hospital or pharmacy. If a patient had discontinued medication, the questionnaire asked the reason for this. All questionnaires included the following questions: Q6. Did the patient's seizures worsen? Q7. How would your household prepare for a future disaster: stockpiling extra medication for a couple of days, having a family doctor, or accessing medicine in a pharmacy located near your home and not in the hospital pharmacy (multiple answers allowed)? If the patients answered stockpiling extra medication, we asked how many days of antiepileptic drugs stocked are needed for future disasters. Another question was asked for severe motor and intellectual disabilities: Q8. How many days of extra antiepileptic drugs were stored when answering questionnaire and what preparations were required for future disasters (open-ended question)? The survey was performed according to the ethical guidelines of the Takuto Rehabilitation Center for Children.

3. Results

Of the 279, 161 physically handicapped patients (57.7%) were completed (the median age was 16.4 years: ranging from 3 to 38 years). 67 patients (41.6%), of 161 respondents, were severe motor and intellectual disabilities. Fig. 1 presents the geographical distribution of their homes, which indicated widely distributed residential area. Of note, 14 patients (8.7%) lived in the area flooded by the tsunami.

The results were as follows (Fig. 2): Q1. 89 respondents answered this question: 36 (40.4%) indicated within 3 days, 25 (28.0%) from 4 to 7 days, 17 (19.1%) from 8 to 14 days, 4 (4.5%) from 15 to 28 days, and 7

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