JMAT Activity Report: From the viewpoint of a disaster-affected medical association that received support

JMAJ 56(2): 86–90, 2013

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Key words JMAT, Great East Japan Earthquake, JMAT support calendar, JMAT meetings, Drug transportation

At the time of the Great East Japan Earthquake I was the President of the Iwaki City Medical Association, and therefore I hereby report the Japan Medical Association Team (JMAT) activities from the viewpoint of a disaster-affected medical association that received support.

The city of Iwaki, which is located in the south of the Hamadori region of Fukushima Prefecture along the Pacific coast, has a population of 343,000. The population requiring health care including the surrounding areas is approximately 500,000. Also, the northern section of Iwaki is a mere 30 km away from the Fukushima Daiichi Nuclear Power Plant that was inundated by the tsunami.

The human toll in Iwaki caused by the earthquake included 310 dead and 37 missing. As the cause of death was drowning in the tsunami, there were hardly any cases of transporting patients with severe trauma or of rescuing survivors from the wreckage. As for damages to medical institutions, four out of 29 hospitals were inundated above floor level in the tsunami; out of 225 clinics, seven were damaged by the tsunami and three were damaged by the earthquake; and out of 12 rehabilitation facilities for the elderly, one was damaged by the tsunami.

The coastal areas of Iwaki were extremely devastated by the tsunami. Inland areas, on the other hand, sustained some damages from the earthquake, but no large buildings collapsed. Since most of the city's hospitals are located inland, hospital functions were maintained to a certain degree.

Following the earthquake, damage to housing in Iwaki was concentrated along the coast, where numerous shelters were established. The accident at the Fukushima Power Plant also caused a flood of evacuees from the Futaba district, especially from the towns of Naraha and Hirono to pour into Iwaki. This urged the establishment of 140 shelters in the city with the total number of evacuees reaching 19,574, making it a pressing issue to ensure health care for them.

After the hydrogen explosion at the Power Plant on March 12, the distribution of food, medical supplies, gasoline, and other goods was disrupted. Water pipes were broken, causing a long-period of water outages. Supermarkets were closed and long queues for gas were seen at the filling stations. This situation resembled that of a famine.

The number of medical institutions at work in Iwaki was about 10% at one week after the earthquake, when medical supplies ran out. On March 16 we submitted a list of necessary medical supplies to Iwaki City and lobbied to ensure them, but it took as long as 10 days to get these supplies.

In this nuclear accident, the area within a radius of 20 km was designated as an evacuation order zone, and beyond this area, planned evacu-

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This article is based on the lecture presented at the Emergency Medicine Liaison Council held on July 26, 2012.

ation zones and emergency evacuation preparation zones were set up. Iwaki City independently established evacuation zones in the Ohisa and Hisanohama districts which are in the northern part of the city. Evacuees from these districts were also observed.

Roughly speaking, the administrative functions in the northern, central and southern parts of the evacuation zones were moved to Fukushima, to Koriyama and Aizu-Wakamatsu, and to Iwaki, respectively. Some were also moved to Saitama Prefecture.

A disaster response headquarters of the Iwaki City Medical Association was established on March 12, the day after the earthquake, because of the difficulty in communication among the officers. On March 13 we started making the rounds of shelters for the affected people, sharing the duties with the Iwaki Kyoritsu General Hospital, a local core hospital. However, it was difficult to collect as many members as possible to participate in medical travelling teams, since telephones, faxes, and other means of communication were incapacitated. Fortunately, Dr. Takashi Nagata of the Japan Medical Association Research Institute (JMARI) came to Iwaki immediately at the introduction of Dr. Masami Ishii, immediate-past president of the Iwaki City Medical Association and current executive board member of the JMA in charge of emergency medicine. And the JMAT, with whom we could share the load of these difficulties, was dispatched from Tokyo to join the rounds.

However, these difficulties were aggravated by explosions at reactor No. 1 on March 12, No. 3 on the 14th, and No. 2 and No. 4 on the 15th in the Fukushima Nuclear Power Plant. This caused additional fear about radioactive contamination. Accordingly, we had the JMAT from Tokyo return home on the afternoon of March 15.

Radiation dose measurements in Iwaki were taken in front of the Iwaki government office complex. The dose rose sharply on March 15, reaching a peak of 23.72 μSv. On the 16th, it decreased to 18.78 μSv, fell to 1.0 μSv on March 28, and was less than 0.5 μSv on April 1, and it tapered off gradually after that. We gave this data to JMAT members during the meetings to be used as a reference for their activities.

On March 16, the Joban Expressway was opened with strong lobbying efforts of the JMA, but hardly any cars were observed coming into Iwaki. The situation took a turn for the better on the afternoon of March 18, when I visited the JMA office in Tokyo at the introduction of Dr. Ishii to ask for assistance. The JMA asked one of the major pharmaceutical companies to deliver drugs to wholesalers in Iwaki. This helped us with the supply of drugs to the Iwaki area in the interim.

On the evening of March 18, the first JMAT Aichi, led by Dr. Kazumi Ono, then-Vice-President of the Aichi Medical Association, entered Iwaki. On March 19, approximately 800 kg of drugs based on a list of necessary supplies were transferred by aircraft from the Aichi Medical Association to Iwaki. This was a great help to our medical practice for the evacuees. We were very pleased to find that they were mostly drugs used in general practice such as anti-hypertensives, diabetes medications, and anti-asthmatic drugs. Later, JMAT arrived from all over Japan including Tokyo, Yamanashi, Toyama, Kyoto, Fukuoka, and Nagasaki, to provide us with continuous support.

As mentioned earlier, most hospitals managed to maintain their functions, such as by transporting inpatients outside the city under difficult circumstances in which the staff could not go to their medical institutions due to damage from the earthquake, water outage, gasoline shortage, and other obstacles. We separated the responsible areas into two between JMAT and the Iwaki Hospital teams, and asked JMAT to undertake medical rounds at the shelters. If we found patients in need of hospital care during the rounds, we referred them to hospitals which were working. We also asked closed hospitals and clinics to try to restart medical services as soon as possible.

We prepared a JMAT support calendar to ask for support without overlap or gaps between teams in response to requests from medical associations in each area and posted the calendar on the Iwaki Medical Association's website (**Fig. 1**). Medical teams organized their schedules to arrive in Iwaki by referring to this calendar.

Because JMAT meetings were a first-time experience for us, we started under the instruction from Dr. Nagata of the JMARI. First I gave a few words of greeting followed by self-introductions from the members of JMAT. Although the participants were meeting for the first time, I felt a

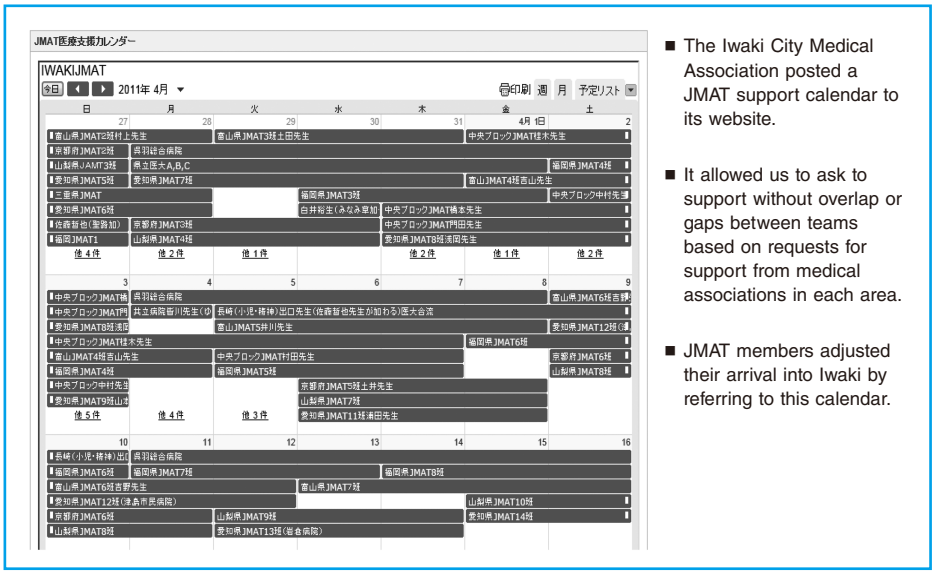

Fig. 1 JMAT support calendar

shared sense of unity as a medical relief team among us as the meetings continued.

The participants in JMAT meetings were JMAT members, pharmacists dispatched by the Japan Pharmaceutical Association, president of the Iwaki Pharmaceutical Association, professor at Higashi Nippon International University who is a mental health and welfare specialist, staff members from Iwaki City's Health and Welfare Department, public health nurses from the Iwaki City Health Care Center, members of the Iwaki City Medical Association who cooperated in making the rounds, and officers of the Medical Association.

Meetings for briefing and handover were held twice a day from March 13 until March 25, once at 9:00 AM before starting the medical rounds and once at 5:00 PM after the rounds. However, taking into account efficiency and the situation gradually calming down, we held a 5:00 PM meeting only from March 26 to May 2, which was chaired by myself.

The shelter checklist that was provided by the JMA is a tool for JMAT to examine the situation and locate the problems at shelters for improvement. We asked teams to make sure to fill it out during the rounds. The checklist was used in the meetings as a basis for the report. The participation of nurses from the Health Care Center and staff of the city's Health and Welfare Department in the meetings enabled a quick response for further improvement.

Public health nurses prepared hand-over documents on the situation at shelters with new information added every day. They were made separately for individual shelters, updated every day, about patients with problems and issues to be addressed in the shelters themselves. This made it very easy to report on the day's activities and, since teams were coming and going frequently, they were very helpful to immediately know which shelter to visit the following day.

The medical record provided by the JMA was used as an alternate clinical chart in shelters. Treatment services provided were free under the Disaster Relief Act, and the effective period of prescriptions was a maximum limit of one week. We considered that one week would be good for prescription because local medical institutions were gradually getting back to normal and there were various problems such as stockpiling of medicines immediately after the disaster.

For chronic disease patients, since a continuous record of treatment is needed, it was necessary to staple the medical charts together. In some cases a folder for individual patients was required for hand-over at each shelter. It seems that problems in introducing electronic medical charts which may be one of the best tools for these difficulties have gradually been resolved.

Table 1 Breakdown of JMAT physicians who were in action in Iwaki

Specialty	Hospital-employed	Private practice	Total
Internal medicine	20	41	61
Surgery/orthopedics	13	12	25
Emergency medicine	12	0	12
Brain surgery	4	0	4
General practice	1	0	1
Pediatrics	2	7	9
OB/GYN	0	3	3
Urology	0	3	3
Otorhinolaryngology	1	0	1
Ophthalmology	0	1	1
Anesthesiology	1	0	1
Psychiatry	3	3	6
Total	57	70	127

Information about the situation in shelters, their needs and others was shared in the JMAT meetings. The problems of sanitation and other living environments in the shelters were also raised during the meetings. Since the staff from the administration also joined the meeting, we could expect quick improvement of these problems. We asked rotating teams to help to distribute a list of active medical institutions and dispensing pharmacies nearby to the evacuees in the shelters for their information, hoping to encourage them to go to medical facilities nearby to prevent their diseases from aggravating. This may have encouraged the recovery of local medical institutions. Our activities were successfully handed over to the Mental Care Team from Fukushima Medical University which was active in the rotating services to the shelters around the same time.

The JMAT teams that worked in Iwaki totaled 73 with 331 members, of which 127 were physicians (**Table 1**). It was highly appreciated that so many prefectures dispatched JMAT teams to Iwaki.

In the breakdown of physicians who participated in JMAT, there were more physicians in private practice: 70 physicians in private practice versus 57 hospital-employed physicians. By specialty, not only physicians who were internists, surgeons, and orthopedic specialists, but also physicians from many other specialties participated in the JMAT activities. Since many health problems occurred in the shelters, physicians from different specialties were much appreciated. The evacuees in the shelters were able to receive the same kind of care as that given in a general hospital.

From about mid-April the evacuees moved from the shelters to temporary housing smoothly. And the number of evacuees in shelters gradually declined (**Fig. 2**). Toward the end of April medical needs in shelters had decreased, privately run transportation between the local medical institutions had started, and approximately 80% of medical institutions in the city had managed to reopen. In light of this situation, we made the decision to conclude JMAT operations on May 3. Fortunately, there were no disaster-related deaths at the shelters reported.

The number of evacuees and shelters in Iwaki began to decrease in accordance with the gradual progress of restoration after the disaster. A slight increase observed on April 16 was due to the aftershock on April 11.

The number of medical institutions practicing after the earthquake was back to approximately 80% on April 30 and 96% on May 16. This reflected the fact that the radiation dose in Iwaki was relatively low, the water outage had been resolved, and a stable supply of drugs was promising.

I thought firstly that medical relief activities were very difficult during this disaster, especially

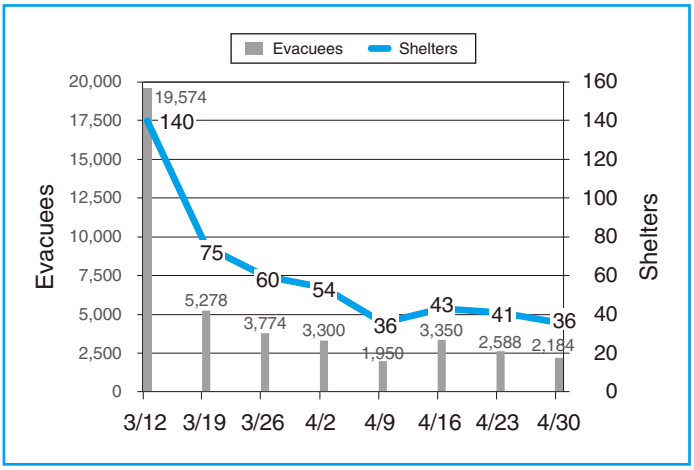

Fig. 2 Number of evacuees and shelters in Iwaki

with the fear of radiation exposure from the nuclear power accident in Fukushima. I would like to express my deepest gratitude to the JMAT members who rushed to help us even in such difficult circumstances. I would also like to call for the government's quick action for the recovery activities including disclosure of information through SPEEDI.[1]

Travelling medical care services went smoothly with the help of pharmaceuticals donated from the Aichi Medical Association. I believe that the establishment of a drug transportation system to disaster-afflicted areas is very important. In the relief activities with the support of JMAT, various tools provided by the JMA such as the JMAT support calendar together with the daily meetings proved to be effective. I would also like to emphasize the effectiveness of electronic medical charts to be used in the event of future similar disasters.

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