The Medical Association Activity and Pediatric Care after the Earthquake Disaster in Fukushima

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On March 11, 2011, a gigantic earthquake struck eastern Japan. Utilities such as electricity, water, gas and telecommunication were interrupted. In Koriyama, the City Hall collapsed and government administration offices had to be moved to a nearby baseball stadium that had been designed to include facilities for use during a pandemic. An operations center was set up in this stadium. As members of the Koriyama Medical Association, we following the disaster protocol and set up our operations center in the Koriyama Medical Care Hospital. One large hospital with 280 inpatients and another hospital with 150 inpatients had been heavily damaged. Transfer of those patients to other hospitals without the use of telecommunications was extremely difficult. Many doctors in member hospitals and clinics went out of their way to cooperate throughout the crisis. Up to 5,000 people from the radiation evacuation zone were rushed to Koriyama. They stayed in schools and community centers, where we provided them with healthcare. Even in Koriyama, which is 60 km away from the Fukushima nuclear power plant, radiation levels were high, especially for the first few weeks. Citizens were advised to stay at home and keep their doors and windows closed. These drastic measures and frequent earthquake aftershocks were very stressful, especially for children. To help prevent children from developing posttraumatic stress disorder (PTSD), a project team composed of various groups caring for children was developed, and this team took action to protect children. Through these efforts we hoped to provide children with an appropriate environment to grow normally, even in a zone of persistent low-level radiation. We demonstrated once again that our members' long history of mutual assistance and cooperation with the administration was the main cornerstone to overcome the crisis. (Keio J Med 61 (1) : 23–27, March 2012)

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Introduction

The ability to cope with an extremely severe disaster that completely destroys the community healthcare system depends on the efforts of, and daily cooperation between, regional medical associations and local government. On March 11, 2011, a massive earthquake struck eastern Japan, followed by a tsunami and radiation exposure from the damaged nuclear power plant. As part of Koriyama Medical Association, we immediately

embarked on an unprecedented journey without a map or guide. We needed to make prompt decisions and take quick actions. Nine months have passed and we can now look back on what we have achieved for our community. Summarizing what we learned in this crisis and presenting it in this article will help provide a guideline for dealing with unforeseen disasters in the future.

Fig. 1 Shelters were incorporated into the plans of the baseball stadium when it was rebuilt.

Collaboration with the Local Government in the Immediate Aftermath of the Earthquake

Koriyama City, located at the center of Fukushima Prefecture, 60 km west of the nuclear power plant, has a population of 340,000 and is a relatively large city in this area. We experienced a large flood in 1998, and at that time we tended to the medical needs of patients in shelters and accepted many displaced patients. When the new strain of swine influenza became pandemic in 2009, we discussed with the local government our role in any future pandemics. The Koriyama Kaiseizan baseball stadium is located in the center of the city, has a large parking area and is near the City Hall. We identified it as the main shelter for patients. When the stadium was rebuilt, our concept was reflected in its design. For example, rooms for shelters were located in the space under the stadium seats in the left and right wings, and the floor of the stadium was at road level so that ambulances could easily enter or leave via the playing field (**Fig. 1**). Our experiences during these disasters have brought us face-to-face with some of the most acute medical emergencies at a community level.

Eastern Japan was struck by a severe quake of magnitude 6 on the Japanese earthquake scale (approximately 9.0 on the Richter scale) at 2:46 pm, when the authors were working in their pediatric hospital. Soon afterwards, the sky became covered with dark clouds, and it became dark and cold as if it was evening, and snow began to fall with wind. The authors' building was seriously damaged with large cracks in the walls. The rooms and halls were littered with the many objects that had fallen to the floor.

It felt as if the end of the world had arrived.

Koriyama City Hall had partially collapsed and was unsuitable for use. Administrative services were moved to the baseball stadium, which is located nearby on the opposite side of the road, and a temporary administration center was established in the rooms that had been originally prepared for use during pandemics. As part of the Koriyama Medical Association (KMA), we set up our operations center in the Koriyama Medical Care Hospital (KMCH), which we run, according to our protocol and consistent with the annual public exercise for emergency in disasters. We started our operations in collaboration with the city administration and our member hospitals and clinics.

Soon after the earthquake, as many as 1000 people rushed to the baseball stadium seeking shelter. The pitchers' bullpens in both wings were opened to the people as shelters (**Fig. 2**). The Self Defense Force stationed in Koriyama Camp arrived and started the supply of water and meals. Many volunteers also came forward to help the people in need. Doctors and nurses were stationed around-the-clock in the health care room and played a role in relieving the anxiety of those seeking shelter.

In Koriyama, infrastructure such as electricity, water, gas and telephone systems were damaged. Big after-shocks occurred frequently. Many people went to originally designated shelters such as regional community centers and schools, and we asked staff at nearby member hospitals and clinics to visit these shelters. Visits by pediatricians were especially appreciated by the parents of badly affected children.

Fig. 2 Evacuees living in the bullpen shelters.

Cooperation of our Members to Restore the Health Care System

Our emergency care system is composed of three stages: primary care clinics are for outpatient care, secondary care hospitals are for those who require hospitalization, and tertiary care hospitals are intended for those who are critically ill. However, almost all of our member clinics and hospitals were partially or totally damaged by the earthquake and its aftermath.

One secondary care hospital, an 8-story building with 280 beds, was severely damaged and had to be closed. The elevators and stairs inside the building could not be used, so inpatients were moved down the emergency stairs located outside the building. Critically ill patients were transferred to tertiary care hospitals, and the remaining inpatients were transferred to branch hospitals by buses and trucks. Premature babies were carried out by pediatricians using the outside stairs and then transferred to another hospital with a neonatal intensive care unit using the private cars of hospital workers. Pediatricians from damaged hospitals temporarily joined the medical teams at the hospitals to which their patients were transferred and worked with them. To evacuate so many patients urgently to other medical facilities without telephone communication was extremely difficult.

The following day, the authorities warned that another

secondary care hospital with 150 inpatients was at risk of collapse, and the inpatients needed to be transferred to safe facilities immediately. The KMCH, where our operations center was established, arranged its rehabilitation hall to accept the whole ward of this hospital including patients and the medical staff who cared for them. We believe that the successful transfer of patients without any casualties was achieved because of our long history of dedicated practice for medical emergencies and the cooperation between our member clinics and hospitals.

Health Care of Evacuees from Highly Contaminated Areas

On March 12, radiation began to leak from the Fukushima Daiichi nuclear power plant and many people from the evacuation zone were rushed to the Koriyama Municipal Gymnasium, which became their first shelter. All evacuees, including children and elderly people who lived in care homes, were checked for surface radiation exposure. The total number of examinations reached more than 28,000. If the surface radiation value exceeded the limit, the person was decontaminated right away and was then taken to the hospital. People whose exposure levels were below the safe limit were directed to other evacuation shelters.

The main shelter was set up in a big convention hall,

Fig. 3 Schema of the Koriyama City Post-disaster Childcare Project.

where a maximum of 2500 evacuees stayed. Doctors living in the evacuation zone, including the president of the regional medical association, were also evacuated to the shelter without their belongings. They voluntarily started delivering medical care to the evacuees. We set up a medical team there and began to support its activities. We found that cooperation with the regional medical association of the evacuation zone was crucial for providing appropriate care in the shelter. Many doctors of the Japan Medical Association Team (JMAT), medical coworkers and volunteers came to support us from all over Japan. We really appreciate their support.

More than 5000 evacuees in total came to Koriyama and settled in the many shelters. Our role was health care, with care of the children's physical and mental wellbeing our main concern. Pediatric support consisted of doing the rounds of the shelters, running a primary emergency clinic on weeknights and holidays, and supporting pediatricians in the secondary care hospitals. Pediatricians in Koriyama worked very hard throughout this period.

Care of Children in an Environment of Persistent Low-level Radiation

In 2006, to counter the declining birth rate, the Koriyama City government organized a committee composed of experienced persons to discuss the problem and make suggestions. The following year, they proposed establishment of a facility to support parents who were raising children, especially those who had children with mental

health problems. It so happened that Koriyama City government took over a 6-story building from Fukushima Prefecture at that time. The building was refurbished and opened as the city child support center in 2009. The children's sections in the City Hall and the organization which supported children with mental health problems moved into this building. Other rooms were opened to volunteer groups and to children as play rooms. The center, named Nikoniko Kodomokan, which means joyful kids house, became popular among young families, with the number of visitors reaching 600,000 in 3 years. This center later played an important role in our project to protect children.

After the earthquake, children feared aftershocks and clung to their mother whenever they felt tremors. Some children stayed close to their mothers all day. The Japanese government recommended the citizens of Fukushima to stay home with the windows and doors closed to avoid radiation exposure. Due to a gasoline shortage, people were unable to use their cars and were obliged to stay home all day, anxious about the present and the future. This drastic change of lifestyle was reflected in children's facial expressions, behaviors and physical conditions. The authors of this article were afraid that many children would develop posttraumatic stress disorder (PTSD). Therefore, we consulted Dr. Hisako Watanabe, a child psychiatrist at Keio University Hospital, about the problems in Koriyama. Her advice was to secure a place where children could feel safe, and to take action to prevent them from developing PTSD. They discussed

the problem with the staff of the child support center and reached an agreement to set up a multidisciplinary team to prevent children from developing mental health problems.

On March 29, the first official meeting of the Koriyama City Post-disaster Childcare Project (KCPCP) was held. The members comprised administration officers, pediatricians from KMA, public health nurses from KMCH, clinical psychologists, and teachers and caretakers from schools, kindergartens and nurseries. Together, they confirmed the following basic principles on promoting the aim of our project (**Fig. 3**). First, all members needed to share the same concept about the current problems and the goal of the project. Second, all members should cooperate with each other when they take actions in one accord. Third, the project will not be short-lived but will be a commitment over the long term. The project also invited regional volunteer groups for children, especially volunteer groups involved in reading storybooks (**Fig. 3**).

In Koriyama, volunteer groups who are engaged in reading storybooks to children have a long history and are very active. The members are those who have mostly finished their busy child-rearing phase of life and have plenty of time to spend with other children. They can easily judge children's state of mind while maintaining some distance, which would allow them to notice subtle changes in children while reading books. Thus they are good candidates for detecting early signs of problems in children. The KCPCP established a way for them to consult us whenever they found anything worrying in the children they met.

Our activities over the past 9 months include distribution of leaflets that illustrated how to care for children with anxieties, setting up children's play corners in evacuation shelters, and organizing lectures by Kunio Yanagida, who is a non-fiction writer, a specialist in nuclear power accidents and a facilitator of storybook reading, and Professor Joy. D. Osofsky, a world-renowned children's trauma specialist from Louisiana State University. We also organized two large children's festivals on Children's Day on May 5 and at the end of the summer holiday to provide children with active indoor play and

enjoyable physical exercises. The project team found that many pregnant women suffered from anxieties concerning radiation exposure. A volunteer group made up of midwives visited the homes of pregnant women, listened to their anxieties and provided them with advice to relieve their worries. The abortion rate did not increase after this disaster thanks to these home visits.

Nobody knows when our living environment will normalize and return to what it was before. The anxiety and stressful living conditions affect not only children, but also their parents, schoolteachers and childcare personnel in nurseries. Our project initially aimed to prevent PTSD, but we are now obliged to take care of both the physical and mental health of local children and their care providers. To compensate for the paucity of physical exercise in children, a project is underway to create a large indoor play space, thanks to contributions from various people in the community. We hope these acts of solidarity will bring a bright future to the children of Koriyama.

Conclusion

Although we survived the earthquake and its immediate and short-term aftermath, it has been a challenging time. Our success in the face of this adversity can be attributed to two factors. First, we had prepared for a large-scale disaster by establishing the baseball stadium as a primary evacuation facility and holding regular emergency drills at KMCH. Those facilities were our operations center during this disaster. Second, members of the medical association had a good relationship with each other and also with the administration. During this sudden crisis, mutual support and collaboration led to greater success. We again underlined the importance of disaster preparation and setting up a network of daily cooperation. We are now fighting against persistent low-level radiation; the solution has not yet been discovered. Although we had not prepared at all for large-scale radiation exposure, the presence of a child support center provided us a base for the promotion of activities to protect children. The solidarity of various groups working for children will improve the situation for the children of Koriyama.