

Missions of Acute Care Physicians for Disaster Medicine

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I am an active member of the Japan Medical Association (JMA) Emergency and Disaster Medicine Management Committee, and in my everyday work I provide acute medical care at a university hospital. As a director of the Japanese Association for Acute Medicine (JAAM), I am also involved in acute medicine overall.

Acute medicine in disaster situations and acute medicine in normal situations are not necessarily the same, and differ greatly in some respects. Moreover, there are various missions for acute care physicians in disaster situations. Under such circumstances, with what sense of duty and responsibility do acute care physicians respond to disasters, and under what limitations do they carry out these responsibilities? This is what I would like to talk about today.

I hope that my talk will enable better understanding of the need for cooperation and coordination between acute care physicians and JMA members.

Introduction

First of all, I would like to talk about the current situation regarding acute medicine in Japan and what exactly “acute care physicians” are.

Shown in **Fig. 1** is the number of physicians in Japan per 1,000 people. Amongst OECD member countries, Japan is hardly a country with a large number of physicians on a population basis.

The OECD average number of physicians per 1,000 people is 3.1, and while the number of physicians in Japan has been increasing, currently there are still only 2.2 physicians per 1,000 people.¹ Of these physicians, only a small number are acute care physicians.

However, healthcare expenditure in Japan is estimated to comprise 8.5% of GDP. Compared with healthcare expenditure in the United States (17.4%) and European countries (11–12%), healthcare services in Japan are being provided with extremely low expenditure.

Number of Acute Care Physicians in Japan

I would like to consider the kind of work that acute care physicians perform under these circumstances. The total number of physicians in Japan is said to be around 280,000, but the membership of JAAM is 10,222; that is to say, only 3.6% of Japanese physicians are members of JAAM. Acute medicine is a new field, and not all JAAM members are equivalent to what are referred to in Western countries as emergency physicians; many are specialist physicians in fields such as internal medicine, surgery, and cardiovascular medicine, who are involved in acute-phase medical care from various standpoints. These physicians joined the JAAM because they have an interest in acute medical care overall

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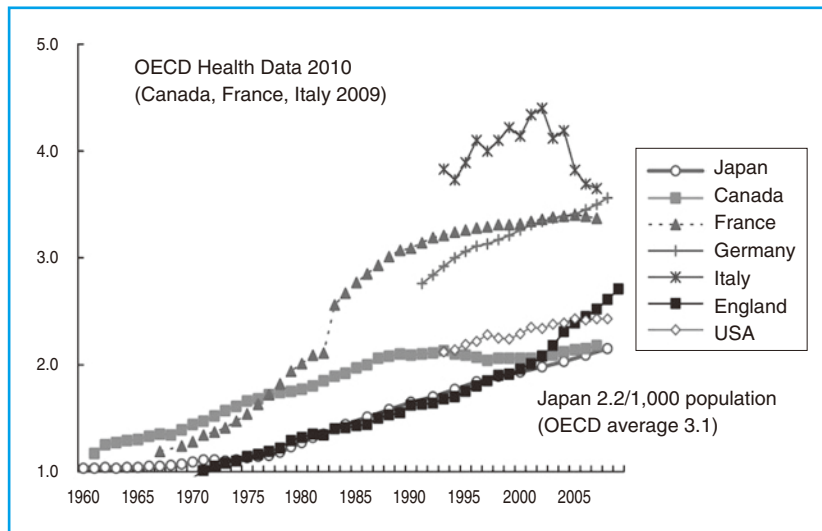


Fig. 1 Physicians density per 1,000

or because they are involved in acute medicine as part of their work.

The members who in fact comprise the core of acute care physicians correspond to acute medicine specialists certified by JAAM. Currently, there are 3,374 JAAM specialists, comprising no more than 1.2% of Japanese physicians overall.

Support of Physicians Other Than Acute Care Physicians in Providing Emergency Medical Services

Since emergency medical services comprise an extremely large proportion of healthcare services, it is impossible for acute medical care to be provided solely by acute care physicians who comprise a mere 1.2% of physicians in Japan. The field of acute medicine existed in Japan even before the birth of JAAM and acute physicians. This was possible because JMA members have provided holiday medical examinations and house visits, and internists, surgeons, and other physicians at general hospitals, regardless of their field of specialization, have cooperated in examining and treating emergency patients at nighttime. Even now, the bulk of acute medical care in Japan is in fact supported by the activities of physicians other than acute care physicians.

According to recent estimates, approximately 20 million of all after-hours emergency patients are taken to hospital via private transportation

each year. Approximately half of these patients are taken to primary clinics, with the remaining half being taken via private transportation—not by ambulance—to emergency hospitals or emergency designated hospitals.

In addition, approximately 5 million emergency patients are transported to hospital via ambulance each year. Of these, even at a relatively large estimate, it is estimated that only around 500,000 critically ill or injured patients are examined/treated by acute care physicians at the tertiary emergency medical centers. The remaining 4.5 million patients are transferred to the secondary emergency hospitals where they are treated not only by acute care physicians.

Role of Acute Care Physicians in Disaster Situations

In Japan there are only around 10,000 acute physicians who are JAAM members, and only about 3,300 who are certified as acute medicine specialists. However, the role of these acute care physicians in disaster situations is not small. In the 2011 Great East Japan Earthquake and subsequent nuclear power plant accident, acute care physicians are thought to have had several roles to play. Under extremely chaotic conditions, many patients visited medical institutions that had been damaged in the disaster, while the medical institutions themselves were in the midst

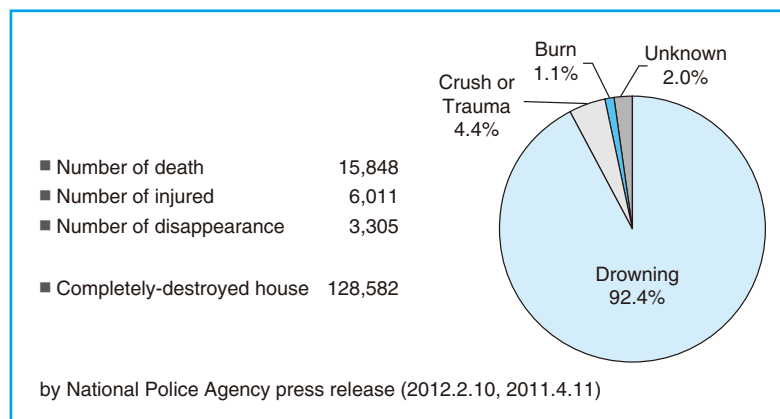


Fig. 2 Casualties and damages

of chaos. At such times, of course the person who takes charge in a leadership role is the person with ultimate responsibility for the hospital, the hospital director. Working directly under the director, acute care physicians are thought to play an essential role in controlling the hospital frontlines.

Another important role of acute care physicians is to provide medical support for disaster zones during the hyperacute phase, which is based on lessons learned from the 1995 Great Hanshin-Awaji Earthquake. In fact, “Disaster Medical Assistance Team” (DMAT) has been organized with the purpose of transporting seriously ill/injured patients over long distances to medical facilities nationwide country based on the assumption that a major disaster will occur—not the Great East Japan Earthquake, but major Tokai, Tonankai, and Nankai earthquakes, mainly in Shizuoka Prefecture.

From the standpoint of readiness as well, it is thought that the role of entering a disaster zone within 24 hours of the disaster occurring—which conventionally physicians have not been able to do—needs to be played in large part by acute care physicians. Furthermore, the transportation of patients over long distances and the acceptance of seriously ill/injured patients by hospitals nationwide are the same thing what acute care physicians do in their everyday work.

However, acute medicine in disaster situations is similar to acute medicine in normal situations but not the same. Although it is somewhat of a cliché, the mission of acute care physicians is to provide a single patient with all the medical

resources they require, with medical professions doing their utmost to save the patient, whereas the mission in disaster situations is to save the maximum number of patients with absolutely insufficient medical resources. Accordingly, when facing and working in a disaster situation, it is necessary for acute care physicians to also change their mindset.

Reasons Why Acute Care Physicians Are Needed in Disaster Situations

Why are acute care physicians needed in disaster situations? Their specific roles are as described above. The history of acute medicine in Japan began with the examination and treatment of mainly seriously ill/injured emergency patients, especially patients with trauma and burn, at tertiary emergency medical centers. Accordingly, one reason why acute care physicians are needed in disaster situations is the specialized skills that acute care physicians have for treating such patients, especially those suffering injuries in the Great Hanshin-Awaji Earthquake.

Furthermore, acute care physicians survey the medical resources available at their own medical institution and control the number of patients and hospital beds in their daily medical activities. I believe that in some cases the medical activities performed by acute care physicians on a daily basis are truly a miniature version of acute medicine for disasters. In particular, the concept of triage is something that acute care physicians are conscious of in their everyday medical activities. In addition, I believe that the ability of acute

care physicians to calmly deal with the influx of patients stems from the training they receive on a daily basis as acute physicians.

Acute care physicians are not only active within hospitals; even under normal situations when no disaster has occurred, they are used to traveling outside the hospital in doctor cars and doctor helicopters to treat patients in critical condition. Consequently, they also have abundant experience working in cooperation with the police and fire department, and I believe these are also factors in why acute physicians are needed in disaster situations.

DMAT Activities in the 2011 Great East Japan Earthquake

In the case of the 2011 Great East Japan Earthquake, not only the earthquake and tsunami disasters but also the consequent nuclear disaster caused tremendous problems. One aspect in particular that differed greatly from the 1995 Great Hanshin-Awaji Earthquake was the huge gap between the number of patients that we initially anticipated as DMAT and actual needs as the result of the tsunami.

The data of **Fig. 2** released by the National Police Agency shows that 92.4% of people who died in the disaster drowned.²

Normally in earthquake disasters without tsunami, we anticipate the rescue activities of DMAT to include treating people who were trapped under rubble or injured in fires. Following the Great East Japan Earthquake, 340 DMAT teams—nearly half of the approximately 880 Japan DMAT teams—were dispatched from all over the country to the disaster zone in the Tohoku region, and the teams traveled to the disaster area from the Kanto region mainly by car. Since the teams were to operate for a period of 48 to 72 hours after the occurrence of a disaster, they were mainly assigned to airports with the purpose of transporting patients to other regions. Due to the special circumstances caused by the tsunami, unfortunately there were not many cases whom DMAT was able to transport from the disaster area and treat ill and injured people there.

At the same time as the other DMAT teams were being dispatched, twelve Tokyo DMAT teams were heading from Tokyo to the disaster zone together with Tokyo Fire Department

Emergency Fire Response Teams. Such DMAT activities are undertaken within a relatively short period after the disaster. This phase is where members are truly acting as acute care physicians, but it is the period after these initial efforts that is really the most important. This is because while the efforts of DMAT are short-term, the needs of disaster victims are not limited to the rescue phase. Under these circumstances, Japan Medical Association Team (JMAT) must achieve extremely great effects.

However, although JMAT is a medical team proposed by JMA, when private-practice physicians of JMA members are amongst the first to go into the disaster area, it exerts a huge burden. Thus, in Tokyo acute medicine specialists as first teams headed for the disaster zone. They of course provided what is usually referred to as disaster medical care—triage, medical treatment, and transportation of patients, etc.

Activities of the Japanese Association for Acute Medicine

I will briefly describe the activities of the JAAM in response to the Fukushima Daiichi Nuclear Power Plant accident. Although many things can be said now, at the time of the disaster the greatest issue was cooling the nuclear reactors. With the earthquake and tsunami knocking out the plant's cooling systems and electricity supply, the only way to cool the reactors was to use water, and the Japan Defense Force (JDF), police agency, fire department, and various other organizations cooperating in working to inject water into the reactors to cool them. Thus Fire and Disaster Management Agency (FDMA) Emergency Fire Response Teams were dispatched to the plant as a trump card in the efforts to cool the reactors.

At this time, the FDMA requested the JAAM to dispatch physicians skilled in both radiation emergency and disaster medicine for the purpose of managing the health of the FDMA members on-site, performing medical checks, providing advice regarding administration of iodine, and formulating strategies related to actual on-site radiation levels, etc.

As part of this first team to enter the nuclear disaster zone, Dr. Yoshihiro Yamaguchi of Kyorin University went first to the J-Village (Japan Football Association's national training center) within

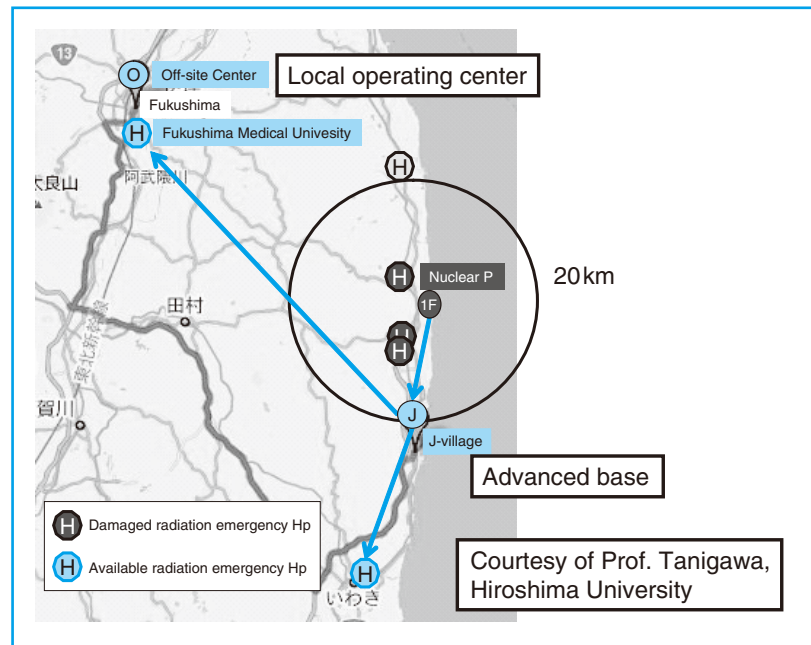


Fig. 3 Re-establishment of the radiation emergency medical system

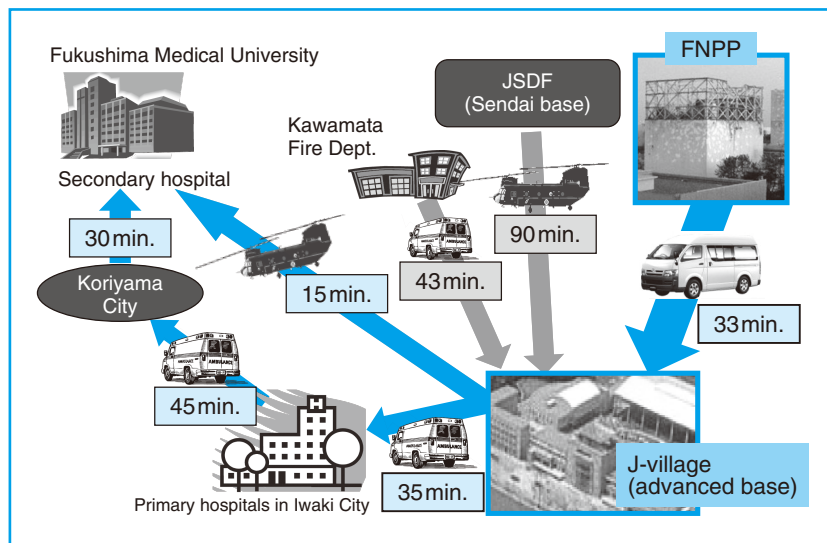


Fig. 4 Estimated time for transport

20 km of the plant, and then to a location close to the plant. Entering J-Village—the actual site of medical activities—on March 17 and 18, one week after the accident occurring, virtually no medical activities were being carried out.

That is to say, a few JDF medical officers were stationed and Tokyo Electric Power Co.

physicians were occasionally visiting the site by turns in the daytime on weekdays. Apart from these, there were no physicians present on-site. Moreover, despite the fact that under the circumstances a major accident could occur at any moment, there were several thousand workers on the job. This was a situation that the JAAM could

not ignore.

Proud of being physicians specializing in acute medicine, we believed that we must go into this zone ourselves and contribute whatever we could. Thus we communicated with the nuclear emergency response headquarters on-site, heard their requirements, and consequently performed two jobs.

Dispatch of Acute Care Physicians to the Fukushima Prefectural Government Office and J-Village

One full-time acute care physician was assigned as an advisor on disaster medicine to the off-site center (local operating center) within the Fukushima Prefectural Office (**Fig. 3**).

These duties involved revising and formulating response manuals and procedures for transportation of patients in the event that multiple people were injured, became ill, or were exposed to high levels of radiation in accordance with the on-site situation, which was changing by the minute, as well as implementing simulation training for such an event. In addition, another physician was also allocated to the J-Village, which was the advanced base for operations.

Whenever there was an accident at the nuclear power plant, first of all workers were brought to the J-Village and a radiation survey conducted, then if necessary the patients were decontaminated and then transported to medical facilities. This role performed by physicians at the advanced base continued for several months; three patients were amongst those transported to the National Institute of Radiological Sciences.

In actual fact, it took about 30 minutes to transport patients by car from the nuclear power plant to the J-Village (**Fig. 4**). Normally it would have been best for the physician to go by helicopter to the nuclear power plant, but in this case there was still the problem of radiation exposure and contamination.

If JDF helicopters or doctor helicopters are used, patients can be transported from the J-Village to medical facilities in a relatively short

period of time. Ultimately, a total of 57 JAAM physicians worked by turns at the advanced base in the J-Village.

The total number of serious patients was 64, of which the three mentioned above had been exposed to radiation, while another 34 had incurred external injuries, of which 2 were in critical condition. Moreover, since many cases of heatstroke were occurring, JAAM compiled a heatstroke manual and gave this to Tokyo Electric Power Co. to minimize the number of patients, but even with these measures there were still 14 heatstroke cases. JAAM physicians also treated various other illness on-site, including cardiac arrest and acute coronary syndromes.

Acute Care Physicians Alone Are Insufficient for Implementing Disaster Medicine

Acute care physicians alone are completely insufficient for providing disaster medicine. In terms of both manpower and disaster phase, what we do is limited to a short period immediately after a disaster occurs. As has been discussed, the core of medical care for disasters is not only a showy DMAT or rescue activities at the scene of disasters but the long-term care of disaster victims that follows from view of public health.

Conclusion

Although acute care physicians naturally carry out medical activities at the scenes of disasters, we also provide the education necessary for all physicians to acquire the skills to be able to perform disaster medicine, such as for example including radiation exposure in the core curriculum of medical school education and we believe that this is another major mission for us.

In addition, we believe that sharing even a little of our knowledge and experience with JMA members and having all JMA members become involved in acute medicine for disasters are another important mission for us.

References

1. OECD Health Data (2010).
2. National Police Agency. Press release. April 11, 2011. February 10, 2012.