

Cooperation between the Self-Defense Forces (SDF) and Civil-sector Medical Institutions - Lessons from the Great East Japan Earthquake

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1. Disaster relief operations by the SDF medics before the Great East Japan Earthquake

According to the "Ministry of Defense Disaster Prevention Plan (only for domestic disaster: formulated in Sep. 2007)," SDF's domestic disaster relief operations are categorized into the following 12 items: grasp of the damage situation, evacuation support, search and rescue of missing persons, flood-prevention, fire-fighting, reopen disrupted land and water routes, emergency medical treatment/first-aid and epidemic prevention, emergency transportation of personnel and goods, food and water supply, free lending or handing over of goods, safekeeping and removal of dangerous goods, and other (which the SDF is capable of handling on an as needed basis). Among these, the items related to the responsibilities of the SDF medics are emergency medical treatment/first-aid and epidemic prevention, emergency transportation of personnel and goods (transportation of patients), and free lending or handing over of goods (provision of medical products).

Disaster countermeasures in Japan are based on the Disaster Countermeasures Basic Act that was enacted on the ground of lessons learned from the Ise-wan Typhoon (Typhoon Vera) in 1959. In accordance with this act, in the case of a disaster, a disaster management headquarters should be established under the direction of prefectural governors/municipal mayors. Institutions including the police, fire brigades, or the SDF should implement rescue operations under the control of this headquarters. However, in Japan, medical support at a time of disaster relief has been mainly provided by civil-sector medical institutions, and therefore SDF medics were rarely requested to take part in disaster relief. For this reason, the 1993 Hokkaido Earthquake was the first occasion for the SDF medics to conduct a disaster relief operation. The second case was the Great Hanshin-Awaji Earthquake (Kobe Earthquake) that struck on January 17, 1995. At this time, since the affected areas faced serious shortage of medical service, the SDF mobilised full potentials of its medics to provide support. SDF Hanshin Hospital (200 beds), located near Kobe, served as a SDF medical relief base, and 18 rescue sites were set up in the affected areas, as well as providing circulating examination (including minor surgical operations using field surgical operation vehicles). In addition, SDF pharmacists were put to work classifying immense amount of medicine brought to the afflicted area as relief supplies. Furthermore, in order to maintain a hygienic environment, the SDF conducted disinfection of raw garbage left rotten due to the collapse of public services.

2. Medical support during the Great East Japan Earthquake and the lessons learned

One of the major problems in the Great Hanshin-Awaji Earthquake was the delay in establishing the initial medical treatment system (it is estimated that if there was no delay, 500 people or around 10% of the casualties could have been saved). Following this, the Japan Disaster Medical Assistance Team (DMAT) system was inaugurated in 2005 at the initiative of the Ministry of Health, Labour and Welfare (MHLW). DMATs are to deal with sudden trauma and crush syndrome in the super-acute phase (48 hours after the disaster strikes) and it is comprised of specially trained medical teams. In addition, in order to be prepared for disasters, the Japanese Red Cross Society (JRCS) formed about 500 medical response units (approx. 7,000 people) which are comprised of doctors and nurses from the Red Cross Hospitals throughout Japan. When a disaster strikes, the relief

teams (each team consists of six doctors and nurses) are dispatched to the affected areas to set up rescue centers and provide medical treatment on-site or at evacuation sites.

In the case of the Great East Japan Earthquake, the supply-demand imbalance of medical treatment was soon eliminated, partly because the initial medical treatment system at a time of disaster was improved as described above. A total of 397 JRCS medical response units were dispatched by March 28, and 33 DMATs were in action as of March 16 when the plan for the reduction of activities was announced. In addition, the Japan Medical Association dispatched a total of 129 disaster medical care teams in 10 days in order to support medical treatment after the withdrawal of DMATs. The SDF started rescue operations immediately after the occurrence of the earthquake, and dispatched a total of 850 personnel, the largest number in history, to provide traveling medical treatment and health care counselling for the victims. The launch of medical assistance showed great improvement; it took three weeks to reach the maximum number of medical assistance personnel after the Great Hanshin-Awaji Earthquake.

On the other hand, although medical support was provided at an early stage, there were two contradictions between the supply and the demand in terms of medical support. One of them was regional allocations of medical support. Some disaster areas did not receive enough support from medical experts, and in some cases the period with a low level of support lasted for a long time. Another was a mismatch in the required subjects of medical treatment. Medical experts thought they would have many surgical patients as a result of the earthquake. On the day of the Great Hanshin-Awaji Earthquake, more than 90% of the patients at the Japanese Red Cross Kobe Hospital were surgical, and this figure was still 63% on the following day. However, in the case of the Great East Japan Earthquake, at the base hospital for disaster in Ishinokaki City (Japanese Red Cross Ishinomaki Hospital), which was severely damaged by tsunami, only 23% of "most urgent" or red triaged patients during 48 hours after the disaster were surgical, while the ratio of chronic disease patients was 32% and hypothermia was 26%. This is because most of the trauma patients were injured during the tsunami. For example, in the Great Hanshin-Awaji Earthquake about 6,500 people died and 45,000 were injured. On the other hand, the proportion is reversed in the Great East Japan Earthquake, 16,000 people died and 6,000 were injured. As a result, the actual medical treatment required was treatment for chronic conditions and prevention of infectious diseases, despite the fact that surgeons rushed to the site with advanced medical equipment in order to provide high-level emergency treatment.

One of the causes was paralyzed traffic networks by the earthquake and tsunami. Only a few of the JRCS medical response units and DMATs had their own transportation method, none of which were off-road type, and they also had refuelling problems. Furthermore, since the collapse of municipal governance, it was not only impossible for affected municipalities to have a full grasp of the requirements for medical support (the number/location of shelters were unknown) but also to control/coordinate rescue operations. When a municipality has lost its administrative function by a disaster, the prefecture is supposed to take the responsibility for disaster relief operations in that area. However, after the Great East Japan Earthquake, prefectural governments could not analyse the situation of the affected areas until the Ground SDF (GSDF) report the state of the affected areas to the disaster management headquarters of the relevant prefectures. The reconnaissance capabilities of the GSDF enabled them to understand the situation more quickly than other organizations. It is also reported that there were a lot of evacuation areas for local residents where only the SDF could reach. For this reason, in the case of large-scale disasters, the SDF needs to take full advantage of its mobility/reconnaissance capabilities to figure out the current status (the number/location

of shelters, details of required medical support, etc.). Such efforts will enable the SDF to eliminate the above mentioned causes of problems. It is also necessary to divide the responsibilities of medical support. For example, civil-sector medical institutions should engage in the medical treatment in areas where traffic routes are secured and the situation is relatively easily grasped, while the SDF medics should be in charge of inaccessible patients.

3. For further development of SDF-civil sector medical cooperation in disaster relief

In principle, medical treatment operation in peace time is conducted in a hierarchical structure where patients are categorized according to the level of severity of their symptoms. This also applies in cases of disaster. Specifically, the hierarchical structure at the time of disaster consists of a "circulating examination team and medical center at a fixed location", "front-line base", and "backward (outside the disaster area) base". The patients are transported to the next level of hierarchy in accordance to the degree of their symptoms. However, rescue operations in the Great Hanshin-Awaji Earthquake and the Great East Japan Earthquake proved that when a large-scale disaster strikes and the transportation network is paralyzed, it becomes impossible to transport the patients and as a result such a hierarchical structure will not function as planned. In addition, even if medical institutions that only suffered minor damage are willing to provide medical treatment, their medical equipment may not operate fully for the damage to the water/electricity supply, or they may not be able to receive enough supplies of medicine or medical products because of the paralyzed transportation system. In such cases, it is essential to secure transportation methods to transport patients across wide areas. The target patients for transportation are as follows: those who need advanced treatment immediately, persons requiring dialysis (in damaged area water supply is disrupted), mildly ill patients in order to vacate beds of hospitals in the disaster zone. From each shelter, temporary medical care site or hospital to the frontline transportation base, patients are carried by ambulances or helicopters of the emergency medical service, the fire department, the police, the SDF, etc. The long-range transportation from the SCU-front will be conducted by SDF airlift fleets. SDF airbases serve as frontline transportation bases, therefore such patients' long-range transportation should be controlled by the SDF. Furthermore, from the point of view of maintaining the seamless connection between medical examinations and transportation, it may be better for SCUs-front to be operated by SDF medics. SDF field medical equipment, like hospital tents and field surgery units, is convenient to establish SCUs-front at airstrips. *Hyuga* class (19,000t full load) flattop helicopter carriers of the Maritime SDF or new class flattops that are under construction (27,000t full load) will be able to work as floating SCUs when coastal areas are hit by a tsunami too severely to be able to establish SCUs onshore. These vessels can operate many helicopters at a time and have medical facilities (operating room, Intensive Care Unit, X-ray room, dental operator, etc.) and beds (JDS *Hyuga* has 35 beds).

In addition, the SDF district hospitals and the SDF Central Hospital (Tokyo: 500 beds, can be expanded to 1,000 beds in an emergency) should be ready as "backward base hospitals," whose existence brings great relief to medical staff in the devastated region who typically suffer from a lack of everything: staff, medical supplies, facilities, electricity, water, time, etc. During the relief operations for the Great East Japan Earthquake, Tohoku University Hospital (Sendai: 1,308 beds), the largest hospital in the region, worked as a "backward base hospital." If "backward base hospitals" have been immediately prepared by some major civilian hospitals, SDF medics do not necessarily need to perform this function.

It will not be possible for civil-sector medical institutions/experts alone to establish a hierarchy of "circulating examination team – front-line base hospital – SCU(front) – SCU(backward) – backward base hospital" at the early stage of a disaster, covering the affected area that had been isolated due to the damaged transportation system. However, if the SDF medics and SDF personnel in other services' work together and cooperate, such medical hierarchy can be established smoothly. On the other hand, the following points should be noted: (a)"Circulating examination team – front-line base hospital" is under the control of the disaster relief medical treatment coordinator on site. (b) In principle, a "circulating examination team" covers the area which cannot be reached without the mobility of the SDF. (c) The purpose of a "front-line base hospital" is to complement civil-sector medical institutions. The SDF medics under the control of the disaster relief medical treatment coordinator should be directed by the front-line base hospital (the SDF district hospitals or field hospitals) in an integrated manner. When the support system by civil-sector medical institutions has been fully established, the SDF medics should hand over its functions to them. In addition, when conducting disaster drills, it should be taken into consideration to implement simulation drills for practicing smooth handing over of medical support functions (from the SDF medics to civil-sector medical institutions.) Furthermore, all the relevant personnel emphasize in one voice that it is important to form human connections through regular drills.

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