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Recommendations on Nutrition Measures in the Event of an Earthquake

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ABSTRACT

Japan is prone to many natural disasters. The damage caused to the country by earthquakes and tsunamis is significant. In preparation for such exigencies, individuals or local governments must establish food delivery and evacuation routes. At the same time, medical and nutritional support by specialists is a little. This article focuses on nutritional support daily current situation and identifying areas for improvement.

INTRODUCTION

Japan is considerably vulnerable to several natural disasters, such as earthquakes and tsunamis, which cause extreme damage (Fig. 1). The most recent disasters were the Great East Japan Earthquake (magnitude: 8.4) in Miyagi prefecture in the Tohoku region in March 2011, the earthquake (6.5) in southern Tokachi area in the Hokkaido region in February 2013, the earthquake (7.3) in Kumamoto prefecture in the Kyushu region in April 2016, the earthquake (6.1) in the northern Osaka area in the Kinki region in June 2018, and the earthquake (6.7) in the eastern Iburi area in the Hokkaido region in September 2018[2)]. Such disasters are expected to continue in the future, and, at the individual level, it is necessary to take measures such as stockpiling food, securing evacuation routes, and confirming hazard maps[3)], while the government (particularly local governments) needs to explore various countermeasures, including infrastructure development, that are necessary to cope with disasters. Doctors, nurses, dietitians, and registered dietitians can also make use of their occupational expertise to help deal with such emergencies. Currently, for dietitians and registered dietitians, the Japan Dietetic Association (JDA) has established the Japan Dietetic Association-Disaster Assistance Team (JDA-DAT), which has been operational since the Great East Japan Earthquake[)]. The task of this team is to provide speedy nutrition and dietary support in affected areas when a large-scale natural disaster occurs. However, their activities are constant and not expected to change based on the magnitude or extent of damage caused by an earthquake or any other disaster. Therefore, we believe that if the damage is extremely large, it will be difficult for the team to respond effectively. This paper highlights the role played by nutritionists and disaster volunteers in Japan in the event of an earthquake and also compare medical assistance in the United States with that in Japan. Based on this review, we consider what kind of support method is desirable and how the current method should be improved.

Tasks of the Japan Dietetic Association in the event of an earthquake[4)]

If a large-scale natural disaster (earthquake, typhoon, etc.) occurs in Japan or overseas, JDA-DAT will promptly cooperate with the medical, welfare, and administrative nutrition departments in the affected areas to respond to the situation in various ways, such as providing emergency nutrition supplements. The aim is to provide aid to the affected areas through nutrition and dietary support activities. Therefore, JDA-DAT needs to have the mobility to act within 72 hours after a disaster, a wide geographical presence to respond to

large-scale disasters and specialized skills for the arrangement and distribution of materials. These skills are nurtured by regular training during normal times. JDA-DAT also has self-sufficiency to procure food supplies and arrange for the means of transportation.

JDA-DAT has been established for designated dietician associations in each prefecture (prefectural dietician associations in 15 prefectures had their own JDA-DAT as of September 2019). JDA-DAT of prefectural dietitian associations in non-affected areas start support activities on their own or in response to a request for dispatch from the JDA, the Ministry of Health, Labor and Welfare, the governor of the affected prefecture, the disaster response headquarters, etc.

JDA-DAT provides the following human and material assistance in the affected areas: 1) Collection of information: Collect, transmit, and share information in cooperation with the medical, welfare, and administrative nutrition departments in the affected areas; 2) Support for emergency nutrition supplies: Understand the content and quantity of materials needed, and direct the arrangement and distribution of materials. For special nutritional foods, the JDA's support may be requested; 3) Nutritional support: Provide direct nutritional support to individuals at the disaster response facilities and evacuation centers with the permission of the person in charge; and 4) Take additional measures such as contacting medical institutions. In the affected areas, lifelines and means of transportation are likely to collapse. Therefore, information collection (grasping the exact situation and needs) in 1) is a prerequisite for support activities.

It is clear that dietitians and registered dietitians rush to work in disaster-affected areas, for which they receive training in advance, but it is unclear where to source food materials. As far as we can tell, JDA-DAT members who rush to disaster-affected areas will be involved in managing food and other items received from all over the country and in planning how much to distribute and to whom. At this stage, there seems to be no need to assume that food is scarce. Support is provided not only on request but also at the team's discretion. We will discuss this topic later, but we would like to stress that it may be necessary for the team to consider whether it is better to rush in to provide assistance in a disaster-stricken area or wait for assistance requests to prevent confusion and ensure that the support is in accordance with the needs of the affected area.

Pharmaceutical support systems in Japan and the United States

We would like to briefly discuss the support system for pharmaceutical supplies in Japan and the United States in the event of a disaster. In the case of Japan, pharmaceutical manufacturers, local governments of the areas affected by an earthquake, and the national government often donate medicines free of charge, which are delivered to the affected areas by the Japan Medical Association (JMA) or by the national or local governments[). When transported by the national or local government, medicines are delivered to a depot managed by the prefecture, but distributing them in small lots to a hospital or medical facility in the disaster-stricken area is a problem. On the other hand, when transported by the JMA, the medicines are delivered directly and promptly to the disaster base hospital, etc[5)]. In the latter case, the doctor apportions the drugs at the hospital, so that they last for several days of treatment, rather than deliver them to the victim as and when desired. The logistics of the JMA in serving affected areas is much more complex and ingenious than that of the JDA, as it takes into account a series of flows ranging from securing pharmaceuticals to transporting and distributing them. Nutritionists and pharmacists focus on individual needs during disasters, the former on dietary needs and the latter on medicinal needs. Victims only need to know what kind of medicine they have used before; it is difficult for pharmacists to distribute medicines if the victim does not have this knowledge. Currently, pharmacists are encouraged to carry and prepare a “medicine notebook”[6)]. Unlike doctors, pharmacists cannot offer direct consultation, making it difficult for them to exert authority.

So, what about the United States? The role of pharmaceutical wholesalers and pharmacies in the United States differs significantly from that of their counterparts in Japan[1)]. Pharmaceutical wholesalers in the United States do not have their delivery personnel. In normal times and even in times of disaster, the actual delivery is performed by an external delivery company. Pharmacies also play a different role in community medicine. Because the United States follows a complete division of pharmaceutical labor, all pharmacies have the inventory of medicines that residents need on a daily basis. Residents’ access to medical institutions is often limited by insurance, and they rely instead on pharmacies for health consultations. For these reasons, access to pharmacies is especially important for residents in evacuation areas and for delivery companies in the event of a disaster[). Despite the differences in roles during normal times, the experience of pharmaceutical supply-related personnel during Hurricane Katrina in 2005 had many similarities to the experience of

pharmacists during the Great East Japan Earthquake in Japan. A large quantity of donated support drugs was collected, mainly from pharmaceutical companies, but transportation, allocation, and disposal were extremely difficult. In the United States, the government reimbursed pharmacies for the cost of medicines for victims. Records at hospitals and clinics were lost, making it very difficult for survivors to understand the contents of commonly used prescriptions. However, Obamacare made it possible to retrieve prescription information from cloud storage, which is likely to be much more advanced than the system in Japan. Unlike in Japan, the first response of pharmaceutical wholesalers in the United States was to secure delivery methods[1)]. Due to the risk of looting, delivery was not made until the delivery route was secured. It took a lot of time to ensure that security. In this regard, Japan can respond more quickly. There are some incomparable aspects between the United States and Japan. It is difficult to deal with earthquakes because they are sudden in nature[1)]. On the other hand, in the case of a hurricane, there is a gap between the time it forms and the time it hits the land when it causes damage. Therefore, preparatory measures, such as stockpiling and investigating the status of pharmacy openings, can be taken in advance for hurricanes, but this is not possible in the case of an earthquake as its occurrence cannot be predicted. Also, because the United States has a large land area, the damage caused by natural disasters is often limited and does not cover the whole country, making it relatively easy to take alternative measures or receive relief supplies from other places. On the other hand, since Japan is a small country, it must be assumed that disasters would affect the whole nation.

In terms of nutrition, food provision in Japan largely relies on the support of unaffected individuals and food manufacturers (Manufacturers may be working as a result of direct requests from the national or local government for support). However, there are often discrepancies in the type and quantity of food that victims need and what is delivered[7)]. Due to delivery problems, some places receive excess supplies, while others receive deficient supplies[8)]. Delivery is either carried out by volunteers or undertaken free of charge by carriers. Alternatively, the national or local government may hire a shipping company or deploy the Self-Defense Forces. As mentioned previously, it is difficult to distribute food supplies to individual victims; hence, the supplies are sent to a place that serves as a disaster recovery center. Distributing the supplies from the center to individuals and homes is the responsibility of the concerned local governments and dietitians. Shopping behaviors in the United States are different from those in Japan, and it is natural to stock up. Furthermore, when their stockpiles run out, people often go shopping by car, making food shortages unlikely in the

United States, which is not the case with Japan. However, in the event of widespread damage, something similar to pharmaceuticals will likely occur. In other words, even if food is available free of charge or economically, transportation could be a problem.

Positive behavior of disaster volunteers[9)]

We think it is wonderful that people serve as volunteers in disaster-stricken areas. However, it is not wise to act without thinking. This topic is being discussed because it seems related to the support provided by experts in affected areas. As mentioned in the previous section, it is necessary to first determine the kind of volunteers that are needed in the affected areas. It means that they cannot do whatever they want to do. In the event of a disaster, they should wait for information provided by local governments before acting. This includes the behavior that should be avoided during the week immediately after a disaster, when food shortages peak[10)]. It is also important to acknowledge that in many cases their efforts will be made in collaboration with other volunteers from different regions. In addition, volunteers need to make preparations in advance to ensure that they do not use the relief supplies, including food and medicines, meant for the victims. Some say that this is not a problem after the first week[10)]. Considering that the victims are still in trouble, toilet and bathing facilities should be given priority. Of course, it is better to consider carrying your gloves and boots so that you can take action immediately. It is also necessary for volunteers to work without stress so that they do not become victims themselves.

If a professional goes to a disaster-stricken area, it is likely that the above factors will be taken into account. Rather than volunteering as an individual, people are often required to act as representatives of academic associations, aid organizations, or businesses, which are capable of supplying more equipment than individual volunteers. Is the objective of professionals different from that of individuals? While organizational efforts may help promote and publicize the name of the concerned organizations, we want them to emulate individual volunteers who do not work with a profit motive.

CONCLUSION

We have so far discussed the issue of nutritional support for affected areas in the event of a large-scale earthquake. At present, there is not enough research on the topic of securing and transporting food. In particular, it appears that problems can arise with transport. In the case

of the provision of drugs, pharmacists need to follow established standards in providing care to patients in disaster-affected areas. However, the case of food provision is different. There are fewer restrictions to food aid than pharmaceutical assistance because food is essential for human survival. While food shortages may be the primary feature of an emergency, the nutritional problems that inevitably follow add greatly to the burden of disease and death. Thus, it is important for specialist dietitians and registered dietitians to respond onsite[11] to estimate the nutritional needs of individuals and deliver key nutritional interventions, such as ensuring that a victim in need of nutrition-supplementary treatment continues to receive it. However, as pointed out earlier, not everything is systematized or designed to work in emergency situations. We think this may need further improvement.

Dietitians and registered dietitians can play a role even before a disaster occurs. They should encourage the public to stock up on food and medicines at home. They should also share the experiences of experts in past disaster cases and explain how relief supplies will not arrive for about a week[12]. However, there are limits to the preparations that individuals and households can undertake (Fig. 2), so it is necessary to encourage local governments in each region to be prepared. Setting up emergency toilets and drinking water facilities is related to nutrition. In addition, it will be necessary to confirm the actions at the time of the disaster and repeat the training. Emulating the approach of the Japan Medical Association may also be an option. It would be desirable if food security and transportation could be considered.

Past experience suggests that the Japanese and Americans would respond differently to a situation where many people need a particular medicine but only a small amount of the medicine is available. The Japanese would give priority to evenly distributing the medication to all those who need it even if the dose is insufficient, while Americans would shortlist candidates and give the medicine only to those people. This reflects national character, as the Japanese have a culture that favors equity and equality. Until now, there has been no need to consider such restricted distribution when there has been a disaster in Japan. This is because relief supplies have always come in large quantities, although they have faced transportation problems[8]. We must, however, assume that the supply of such goods could be lesser in the future, learning from the example of the United States to see how to deliver them efficiently and fairly based on who has the most pressing need. It may be necessary to think about nutrition from a broader perspective.

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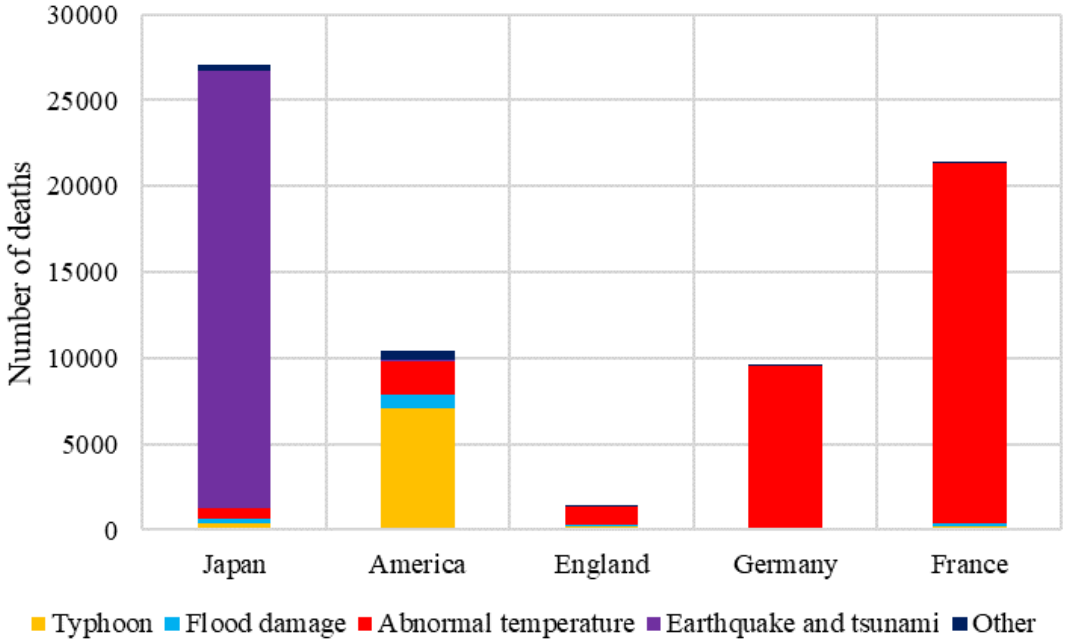

Fig. 1 Deaths from natural disasters in Japan, the United States, and Europe over the past 30 years

Based on data from Reference 1).

Cumulative value for 1984-2014

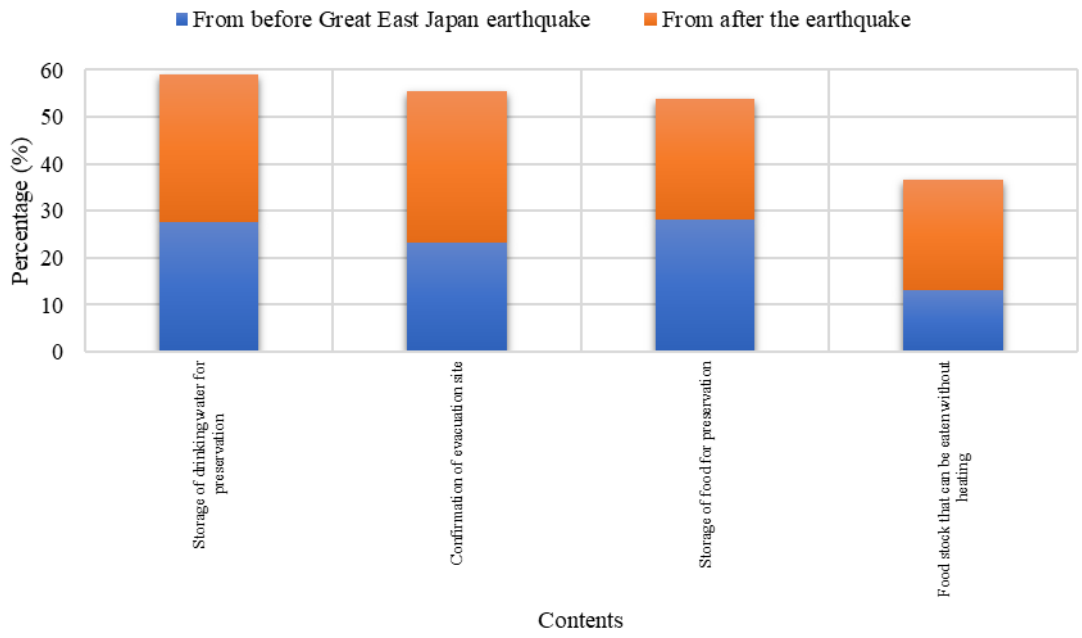

Fig. 2 Proportion of people that has undertaken food-related preparations for earthquake

Based on the data from Reference 2).

In December 2014, the Tokyo Gas Urban Life Research Institute surveyed citizens across Japan (n = 1,200).