

Commentary

Feeding Support Team for Frail, Disabled, or Elderly People during the Early Phase of a Disaster

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Japan was struck by two catastrophic disasters on March 11, 2011 and on April 16, 2016. The former was the Great East Japan Earthquake (M9.0) and the latter was the Kumamoto Earthquake (M7.0). Most inhabitants in the affected areas of both disasters were forced to live in evacuation centers right after the earthquake. Poor oral hygiene, inactivity, malnourishment, appetite loss, eating problems, and swallowing problems due to lack of support for frail, disabled, or elderly evacuees occur during the early phases after a disaster. Disaster-related sequelae, such as pneumonia and disuse syndrome, may also occur as a result of inappropriate nutritional and physical support. Adequate oral intake and physical activity are important to the quality of life for evacuees. We learned lessons from our experiences of evacuee support after the two disasters, focused on feeding support, which consisted of nutritional and physical care. Our experiences revealed that more rapid intervention is necessary, particularly for frail, disabled, or elderly people. In this study, based on our experiences from the two dreadful disasters in Japan, we propose a new concept of medical assistance after a disaster, the Disaster Feeding Support Team (D-FST). The D-FST is composed of multidisciplinary professionals and provides comprehensive nutritional, physical, and health support. The D-FST also performs interventions for swallowing exercises, activity, health condition, and cognition that are related to eating circumstances. We suggest that D-FSTs are organized nationwide and initiate support activities immediately after the onset of a disaster.

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Commentary

The twin earthquakes of the Kumamoto Earthquake struck Kyusyu, Japan, on April 14 (M6.2) and 16 (M7.0), 2016. Mashiki, a town near the epicenter of the earthquake with a population of 33,860 (25.3% older than 65 years) at the time of the earthquake, received more damage than other neighboring towns. More than 10,000 houses were destroyed, and most people living in Mashiki Town Area took refuge in evacuation centers immediately.

A previous report suggested that physical inactivity and a restricted lifestyle in the evacuation centers developed immobilization syndrome (Liu et al. 2012), which causes pathological changes in the body and several sequelae. Recent studies have also shown the importance of nutrition support following a disaster (Nekouie Moghadam et al. 2017; Cordero-Reyes et al. 2017). However, the study by Nekouie Moghadam et al. (2017) did not recommend any

methods for nutritional intervention or prevention of inactivity in evacuated elderly people. The evacuated frail, disabled, or elderly people are more likely to be inactive, malnourished, and at risk of developing sequelae such as pneumonia, which likely develops in frail, disabled, or elderly people with impaired activities of daily living (Yamada et al. 2013). Both community- or hospital-acquired pneumonia (Teramoto et al. 2008) and shelter-acquired pneumonia (Suzuki et al. 2011) are reported to be associated with aspiration. Furthermore, decreased physical function due to disuse syndrome has been reported to be common in evacuation shelters.

We learned lessons from our experience of voluntary activities, focused on feeding support, which consisted of nutritional and physical care for disaster victims of the Great East Japan Earthquake in 2011. Our experience revealed that more rapid intervention is necessary, particularly for frail, disabled, or elderly people, because, it could

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easily be assumed that usual self-care for frail, disabled, or elderly people, either by themselves or from their family or guardians, would suddenly stop after a major disaster and in evacuation centers. Gradual increases in the incidence of aspiration pneumonia and disuse syndrome were recognized even after 6 months.

Therefore, we decided to provide preventive care for frail, disabled, or elderly people from developing sequelae, such as aspiration pneumonia and disuse syndrome, immediately after the Kumamoto Earthquake. We considered that this preventive care should be multidisciplinary including feeding support and primary care. Feeding support and primary care for evacuated frail, disabled, or elderly people might need the same effect as consecutive intervention for the elderly people based on comprehensive geriatric assessment in the clinical settings (Ellis et al. 2011), which becomes increasingly common.

We organized a team which comprised of individuals from multiple disciplines, such as physicians, dentists, dental hygienists, nurses, speech language pathologists, dietitians, physical therapists, social workers, and logistic officers. An advance team started to visit 31 shelters and confirmed the needs for feeding support at Mashiki and the surrounding area within 12 hours. The feeding support and care of our team included not only food supply, but also multidisciplinary care to maintain or improve the feeding environment, type and texture of food, water intake and nutrition, posture adjustment during mealtime, oral hygiene, swallowing exercise, physical activities during daytime, and defecation. Therefore, comprehensive and multidisciplinary team support and assessment tools for feeding support were necessary. Our team was too small to cover all shelters, so we prioritized the intervention in three of 31 evacuation centers with the most serious living and dietary environment, because too many evacuees had gathered at the centers, there were few pedestrian lanes, and the centers

were chaotic. We allocated our team members to the three centers and started providing feeding support on the third day after the first attack. The people we talked to anonymously said “I avoid drinking water as much as possible because I am unwilling to go to the toilet”, “I have not brushed my teeth since the evacuation”, and “I am trying not to physically move within my designated area in the centers after evacuation”. From these experiences, we discerned that these centers were grounds for developing sequelae.

We visited directly to the place where the frail, disabled, or elderly people possibly were staying, identified their medical and nursing care needs, and provided appropriate intervention. (Fig. 1) We talked about the recent amount water and food intake, and assessed their nutritional status, physical and swallowing functions, oral hygiene, and amount of physical activities. Each member provided support and care for the evacuees through utilizing their own expertise and the Kuchi-kara Taberu (KT or ingesting orally in Japanese) index, which we previously developed, and confirmed the validation as multicomponent assessment tool for eating behavior, and assessed their eating circumstances comprehensively (Maeda et al. 2016). Of the 24 frail, disabled, or elderly people who could be assessed using the KT index, 19, 15, 12, 10, 8, and 8 people showed poor oral hygiene, inactivity, malnutrition, appetite loss, eating problems, and swallowing problems, respectively. We also found that the texture of the standard meals provided by the Japan Self-Defense Forces and other organizations was not suitable for some people, resulting in a decreased amount of food intake. Therefore, our team arranged regular distribution of rice porridge three times a day. At least 10 people who required rice porridge were living in a center with 500 evacuees. The team also performed intervention to reduce the risk of further inactivity. All members of the team asked the evacuated elderly peo-



Fig. 1. Activities of the Disaster Feeding Support Team.

A: The team interviewed evacuated elderly people with disabilities in the evacuation center and identified nutritional, physical, social, and medical problems. B: To discourage inactivity, the team provided a bed made from cardboard boxes for frail, disabled, or elderly people who slept directly on the floor. C: The team performed oral care to prevent poor oral hygiene. D: The team served nutritious and texture-modified meals for elderly people with swallowing difficulties.

ple to perform light exercise, such as stretching the legs, arms, and neck, and rising up from the floor to avoid prolonged immobility as much as possible during the daytime. The study was approved by the Ethics Committee of the Tamana Regional Health Medical Center.

There may be a high incidence of morbidity among evacuated frail, disabled, or elderly people owing to the following reasons: (a) they are susceptible to dehydration due to restricted water intake, and they hesitate to walk to the crowded outdoor bathroom; (b) they cannot maintain their oral hygiene, such as brushing their teeth or dentures cleaning due to the lack of or nonconformity with oral hygiene supplies; (c) they are prone to malnutrition and dehydration because they do not try to walk to the relief supply station, and the distributed supplies, water, and food do not always reach them; (d) physical activity is extremely reduced, subsequently causing disuse syndrome and muscle weakness; and (e) few people in the shelter watch out for the frail, disabled, or elderly people, who are unable to maintain physical fitness, health, and nutritional status due to the lack of relief supplies and foods.

From our experience during the Great East Japan Earthquake and the recent Kumamoto Earthquake, we became keenly aware that supportive intervention is required in the early phase after a disaster, so we propose a new concept named the Disaster Feeding Support Team (D-FST) as a medical support system. The team will focus not only on what to eat, but also on how to eat, particularly for frail or disabled persons, with a concept of combining rehabilitation and nutritional support (Wakabayashi and Sakuma 2014). Similar to the comprehensive geriatric assessment, this approach will be expected to result in harmonized teamwork among the multidisciplinary team, which includes physicians, dietitians, nurses, physical/occupational/speech therapists, dentists, dental hygienists), and others. The D-FST will provide feeding support during the early phase of a disaster to prevent sequelae caused by malnutrition, dehydration, and physical deconditioning. Members of the D-FST will share the concept of feeding support in terms of preventive medicine and provide feeding support during the early stage of disaster to prevent sequelae caused by malnutrition, dehydration, and physical deconditioning. The support plan and methods should be studied as standard medical care during medical education or initial medical training.

Evacuated frail, disabled, or elderly people are at risk of rapid decrease in the dietary intake, amount of daily activity, increased stress, developing sequelae, such as pneumonia. The D-FST can play a similar role to nutrition support team in the clinical settings. Nutrition and physical therapy, provided by D-FST for frail, disabled, or elderly people can contribute to the improvement of independence and health-related quality of life in the shelter, as well as in the clinical setting (Wakabayashi and Sakuma 2014). Therefore, we believe that D-FST activities, which provide intervention for feeding support and aim at preventing of

sequelae onset, will be essential.

However, feeding care following a disaster might have some limitations regarding dietetic intervention during the early phase. This is due to the lack of evacuees' information on medication and disease-related nutrient restriction such as dietary requirements for kidney diseases or food allergies, and avoidance of excess carbohydrates and salt. This problem must be solved in future studies.

In conclusion, we expect that the D-FST will be organized nationwide, and will go to affected areas immediately after a disaster and deploy comprehensive health management and care throughout damaged areas.

Conflict of Interest

The authors declare no conflict of interest.

References

- Cordero-Reyes, A.M., Palacios, I., Ramia, D., West, R., Valencia, M., Ramia, N., Egas, D., Rodas, P., Bahamonde, M. & Grunauer, M. (2017) Natural disaster management: experience of an academic institution after a 7.8 magnitude earthquake in Ecuador. *Public Health*, **144**, 134-141.
- Ellis, G., Whitehead, M.A., O'Neill, D., Langhorne, P. & Robinson, D. (2011) Comprehensive geriatric assessment for older adults admitted to hospital. *Cochrane Database Syst. Rev.*, doi: 10.1002/14651858.CD006211.pub2.
- Liu, M., Kohzuki, M., Hamamura, A., Ishikawa, M., Saitoh, M., Kurihara, M., Handa, K., Nakamura, H., Fukaura, J., Kimura, R., Ito, T. & Matsuzaka, N. (2012) How did rehabilitation professionals act when faced with the Great East Japan earthquake and disaster? Descriptive epidemiology of disability and an interim report of the relief activities of the ten Rehabilitation-Related Organizations. *J. Rehabil. Med.*, **44**, 421-428.
- Maeda, K., Shamoto, H., Wakabayashi, H., Enomoto, J., Takeichi, M. & Koyama, T. (2016) Reliability and validity of a simplified comprehensive assessment tool for feeding support: Kuchi-Kara Taberu Index. *J. Am. Geriatr. Soc.*, **64**, e248-e252.
- Nekouie Moghadam, M., Amiresmaei, M., Hassibi, M., Doostan, F. & Khosravi, S. (2017) Toward a better nutritional aiding in disasters: relying on lessons learned during the Bam Earthquake. *Prehosp. Disaster Med.*, doi: 10.1017/S1049023X17006355, [Epub ahead of print].
- Suzuki, M., Uwano, C., Ohru, T., Ebihara, T., Yamasaki, M., Asamura, T., Tomita, N., Kosaka, Y., Furukawa, K. & Arai, H. (2011) Shelter-acquired pneumonia after a catastrophic earthquake in Japan. *J. Am. Geriatr. Soc.*, **59**, 1968-1970.
- Teramoto, S., Fukuchi, Y., Sasaki, H., Sato, K., Sekizawa, K. & Matsuse, T.; Japanese Study Group on Aspiration Pulmonary Disease (2008) High incidence of aspiration pneumonia in community- and hospital-acquired pneumonia in hospitalized patients: a multicenter, prospective study in Japan. *J. Am. Geriatr. Soc.*, **56**, 577-579.
- Wakabayashi, H. & Sakuma, K. (2014) Rehabilitation nutrition for sarcopenia with disability: a combination of both rehabilitation and nutrition care management. *J. Cachexia Sarcopenia Muscle*, **5**, 269-277.
- Yamanda, S., Hanagama, M., Kobayashi, S., Satou, H., Tokuda, S., Niu, K. & Yanai, M. (2013) The impact of the 2011 Great East Japan Earthquake on hospitalization for respiratory disease in a rapidly aging society: a retrospective descriptive and cross-sectional study at the disaster base hospital in Ishinomaki. *BMJ Open*, **3**, e000865.