Disaster Medicine and Public Health Preparedness

www.cambridge.org/dmp

Challenges and Implications of Providing Continuous Care for the Elderly in Disaster Situations: A Case Study from the Noto Peninsula Earthquake

Michioki Endo MD[1], Akihiko Ozaki MD, DrPH[2], Ryo Ikeguchi MD[3], Chika Yamamoto RN[4], Toshiki Abe PT[4], Sakiko Inoue BSN[5], Kazuko Ishikawa RN[6], Yuki Kikuchi RN[7], Tianchen Zhao[4], Masahiro Kami MD, PhD[8] and Hiroyuki Beniya MD[9]

[1]Resident, Mitoyo General Hospital, Kanonji, Kagawa, Japan; [2]Department of Breast and Thyroid Surgery, Jyoban Hospital of Tokiwa Foundation, Iwaki, Fukushima, Japan; [3]Katsuyama Orange Clinic, Katsuyama, Fukui, Japan; [4]Department of Radiation Health Management, Fukushima Medical University School of Medicine, Fukushima, Fukushima, Japan; [5]Kushigata Junior High School, Minami-Alps, Yamanashi, Japan; [6]Grundtvig, Fujisawa, Kanagawa, Japan; [7]Hotch no lodge, Karuizawa, Nagano; [8]Medical Governance Research Institute, Minato City, Tokyo, Japan and [9]Orange Home Care Clinic, Fukui, Fukui, Japan

Abstract

On January 1, 2024, an earthquake with a maximum seismic intensity of 7 struck the Noto Peninsula in Ishikawa Prefecture, Japan, causing significant casualties and displacement. The Noto Peninsula has a high aging rate, with 49.5% of its population aged 65 or older. This case study focuses on a 68-year-old woman who developed aspiration pneumonia after being admitted to a welfare shelter. The case highlights the challenges of managing chronic medical care during disasters, particularly for the elderly.

Report from the Field

Cite this article: Endo M, Ozaki A, Ikeguchi R, Yamamoto C, Abe T, Inoue S, Ishikawa K, Kikuchi Y, Zhao T, Kami M and Beniya H (2024). Challenges and Implications of Providing Continuous Care for the Elderly in Disaster Situations: A Case Study from the Noto Peninsula Earthquake. *Disaster Medicine and Public Health Preparedness*, **18**, e307, 1–2
https://doi.org/10.1017/dmp.2024.161

Received: 06 March 2024
Revised: 09 June 2024
Accepted: 21 June 2024

Keywords:
Disaster Medicine; Disasters; Earthquakes; Communication; Delivery of Health Care

Corresponding author:
Michioki Endo;
Email: michiokiendo.med@gmail.com

Several factors contributed to the patient's condition, including prolonged bedridden state due to staff shortages and insufficient handover of critical medical information. The study suggests two key areas for improvement in disaster response: the importance of primary care and the necessity of efficient information provision. Establishing Disaster Nursing Support Teams to provide continuous care for vulnerable populations and implementing robust systems for sharing medical information are recommended.

The paper discusses the feasibility of these improvements given current disaster response structures and emphasizes the need for centralized shelters with adequate resources. Ethical dilemmas arising from resource constraints during disasters are also considered. The findings underline the need for comprehensive disaster preparedness strategies that address both acute and chronic medical care needs, particularly in aging populations.

On January 1, 2024, an earthquake with a maximum seismic intensity of 7 struck the Noto Peninsula in Ishikawa Prefecture, Japan.[1] As of March 1, there have been 241 fatalities, 11,048 people are continuing to live as evacuees, and 76,824 residential buildings have been damaged. Japan is the most aged country in the world, with 28.7% of its population being 65 years of age or older.[2] The Noto Peninsula has an even higher aging rate of 49.5%.[2] With the progression of aging, the required medical care could shift. In general practice, there has been a shift from acute medical care to chronic care. The health care delivery system has also shifted its emphasis from in-hospital intensive treatment to care services such as home health care. However, the impact of aging on disaster medicine remains unclear.

Case Presentation

On January 9, a 68-year-old woman was admitted to our welfare shelter. This woman, who required caregiving due to walking difficulties stemming from hip joint surgeries in her childhood, had previously been cared for by her cohabiting brother along with receiving public home nursing and caregiving services.

Her brother developed a fever of 40°C, rendering him unable to provide care, leading to her admission. Upon admission, we were informed of her age, gender, name, medical history, and the reason for shelter admission over the phone.

At the time of admission, she had caught a cold and was frequently expectorating sputum, but her overall condition was good. She spent most of her time in bed after admission.

On January 11, the patient, unable to control her copious sputum production on her own, vomited after suction by the staff and subsequently complained of respiratory distress. Her fever rose to 38°C, and her oxygen saturation dropped to 84%. Decreased breath sounds in the left lung and rhonchi and coarse crackles in the right lung were noted. Although blood and imaging tests were challenging to perform in the shelter, aspiration pneumonia was diagnosed based on the clinical course.

We considered emergency transport to a tertiary hospital, but due to the presence of capable personnel, we managed her in the shelter with squeezing, sputum suction, positional changes, administration of antibiotics (Levofloxacin), and oral care. By January 15, her oxygen saturation improved to 94%, and she was on as-needed sputum suction.

Further inquiry revealed that she had been receiving oral care at home, which was not continued after the earthquake. She used a walker for mobility at home but became bedridden after shelter admission. It was also discovered that she had been taking antipsychotic medication for some purpose. Initially, around five nurses and care workers were managing her care, but as the shelter admitted about ten more individuals on the same day, the total number of evacuees reached about thirty. As a result, there were discrepancies in the handover among staff due to the preparation for acceptance, response, and paper management of evacuee information.

Discussion

Notably, this case highlights the development of aspiration pneumonia on the second day after admission, indicating a rapid deterioration of the patient's overall condition after entering the welfare shelter. Several reasons can be considered for this.

Firstly, the continuation of a bedridden state in the shelter, possibly due to staff shortage, meant that she spent most of her time lying in bed, except for meals, leading to a rapid decrease in muscle strength. Japanese disaster medical care is based on the experiences from the Great Hanshin-Awaji Earthquake, where teams centered around emergency specialists, such as the Disaster Medical Assistance Team (DMAT), provide care to trauma patients and others in the affected areas. However, what was required in this case was the continuation of chronic medical care. This perspective is crucial in disaster medical care in regions with advanced aging.

The second reason is insufficient handover. Details about oral care, the abundance of sputum, antipsychotic medication, and activities of daily living (ADL) were not communicated. Aspiration pneumonia is the highest risk of disaster-related deaths.[3] This patient had risks, such as the use of dentures, which necessitated thorough prevention of aspiration pneumonia, yet no such information was handed over, resulting in inadequate response.

This case suggests two significant points. First, it underscores the importance of primary care. As seen in this case, pneumonia remains a serious cause of mortality during disasters, just as in normal times. Therefore, it is essential to prepare for common diseases during disasters, just as we do in peacetime. For instance, in Japan, establishing "Disaster Nursing Support Teams" that can continuously provide care for the elderly and disabled to complement medical care by DMAT might be a viable option. Second, it highlights the importance of information provision. Major disasters drastically change the living environment of the elderly, and as seen in this case, the attending physician or caregivers might change. This case indicates that the continuity of care is crucial in disaster preparedness for the elderly, suggesting the need for systems to share medical and caregiving information. Specifically, the use of digital transformation applicable during disasters will be necessary in the future.

However, there remain doubts about whether such insights can be widely introduced in future disasters under the current system. More specifically, maintaining primary care and information sharing systems with limited personnel and resources quickly is inefficient with scattered small shelters, as seen currently. Centralizing shelters to establish large shelters with adequate resources, personnel, and medical services promptly and allocating administrative resources for rapid evacuation to such centers might be possible. On the other hand, large shelters set up as secondary evacuation sites have encountered issues such as overcrowding and the dispersion of medical resources. Furthermore, if an outbreak occurs in such shelters or a secondary disaster strikes, all functions could be paralyzed. Thus, during disasters, ethically challenging issues arise from the need to derive the best possible outcomes from limited manpower and resources. It is necessary to openly discuss these issues, considering the advantages and disadvantages, involving many stakeholders.

Author contribution. Conceptualization, all authors; resources, R.I., C.Y., T.A., S.I. and T.Z.; data curation, K.I. and Y.K.; writing—original draft preparation, M.E.; writing—review and editing, all authors; supervision, M.K.; project administration, H.B. All authors have read and agreed to the published version of the manuscript.

Competing interest. Dr. Ozaki received personal fees from MNES, Kyowa Kirin Inc., Becton, Dickinson and Company, Pfizer, and Taiho Pharmaceutical Co., Ltd., outside the scope of the submitted work. Dr. Kami reports other from AIN HOLDINGS INC Donation, personal fees from SBI Biotech Co. Outside director, and personal fees from Mnes Inc. Advisor outside the submitted work. The other authors declare no conflicts of interest.

References

1. **Conroy G.** Japan earthquakes: the science behind the deadly tremors. *Nature.* 2024;**625**(7994):228.
2. **Communications MoIAa**. *Census / Reiwa 2 Census / Basic Population and Housing Census*. General Contact for Government Statistics (e-Stat); Ministry of Internal Affairs and Communications; 2020.
3. **Morita T**, **Nomura S**, **Tsubokura M**, et al. Excess mortality due to indirect health effects of the 2011 triple disaster in Fukushima, Japan: a retrospective observational study. *J Epidemiol Community Health.* 2017;**71**:974–980.

https://doi.org/10.1017/dmp.2024.161 Published online by Cambridge University Press