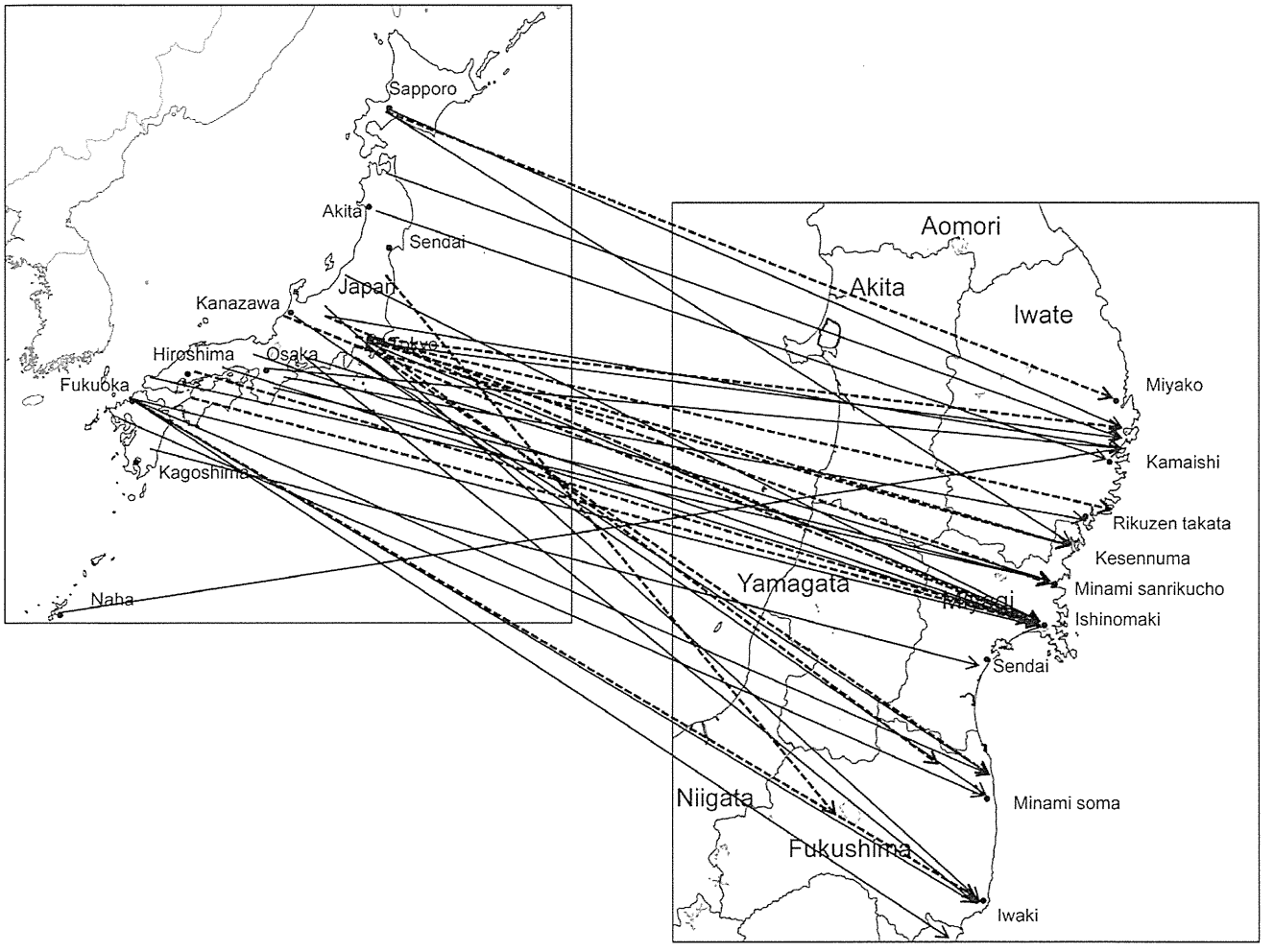

Figure 1 One week after the 2011 Tohoku earthquake, 20 000 booklets for non-medical care providers were distributed by members of the Japan Geriatrics Society (dotted lines) and Japan Medical Association Team (straight lines), to evacuation centers located in Iwate, Miyagi, and Fukushima prefectures.

Evacuees" was formed, with funding from Japan's Ministry of Health, Labour and Welfare, to conduct comprehensive research on aging and health. The study group aimed to complete and revise the guidelines based on external reviews by expert medical doctors by March 2012.

By collaborating with the Japan Geriatrics Society after the 2011 earthquake off the Pacific coast of Tohoku, we have quickly published two tentative guidelines to manage elderly evacuees: one for medical care providers and another for non-medical care providers (NMCP), including volunteer, helpers, and family members who are taking care of the elderly, public health nurses (PHN), or certified social workers (CSW). A total of 20 000 guideline booklets have been distributed by members of the Japan Geriatrics Society and the Japan Medical Association Team to NMCP, PHN, or CSW working in Iwate, Miyagi, and Fukushima prefectures (Fig. 1). The Japan Medical Association Team's mission is to provide medical assistance at hospitals or clinics in disaster-affected areas and to provide ongoing medical treatment that was started before the disaster.[6]

Preface

The guidelines for NMCP, PHN, and CSW have three chapters: (i) Features and prevention of critical diseases in elderly in evacuation areas; (ii) Signs of acute diseases in elderly; and (iii) Symptoms of anxiety in elderly in shelters. Ideally, NMCP, PHN, or CSW will use the booklets to rapidly detect illnesses in the elderly in shelters or homes. NMCP, PHN, or CSW should immediately inform attending medical staff when those with the signs or symptoms are detected.

Guidelines

I. Features and prevention of critical diseases in elderly in evacuation areas

1–1). Heart attack. This condition includes angina pectoris, myocardial infarction, and other illnesses due to myocardial ischemia, a lack of blood flow in arteries.

Signs and symptoms of a heart attack

Location of symptoms	Central chest to left side of chest Apart from chest discomfort, anginal pain in the upper central abdomen, back, neck, jaw, or shoulders
Detailed symptoms	Worsening ("crescendo") chest pain, specifically crushing, burning, or choking sensation Onset of severe oppression or worsening oppression
Duration of symptoms	Infrequent or lasting less than 10 min Lasting more than 15 min, suggesting unstable condition

Note: Caution is needed because silent or mild symptoms frequently occur in the elderly, especially in those with diabetes. In addition, elderly people sometimes present with atypical symptoms, including breathlessness, nausea, discomfort in the upper central abdomen, or burping.

Measures to prevent heart attack in shelters

- NMCP, PHN, or CSW should be aware of elderly who normally take medication for cardiac disease and/or hypertension.
- NMCP, PHN, or CSW should check on the elderly.
- NMCP, PHN, or CSW should ensure that the elderly drink plenty of fluid, including water, to prevent dehydration. They should also advise that the elderly consume a low-salt diet and not smoke.
- If the elderly have any of the above symptoms, medical staff should be alerted.

Tips to treat cardiopulmonary arrest in shelters

- NMCP, PHN, or CSW should perform CPR, pushing the central chest strongly and quickly (100 times per minute) and alert medical staff immediately.

1–2). Hypertension. Awareness of blood pressure (BP) and its variability in the elderly is necessary because they may have excessive mental and/or physical stress, especially if in an emergency evacuation area or first-aid station, relative to their day-to-day lives before the disaster.

Measures to deal with elderly receiving antihypertensive drugs

- First, elderly people who are usually prescribed antihypertensive drugs should be reported to medical staff. NMCP, PHN, or CSW should check on the elderly.
- Elderly people who have been diagnosed as hypertensive should also be checked by medical staff, NMCP, PHN, or CSW.
- BP should be measured frequently. If possible, it is better to measure it daily using an automatic BP machine. In high-risk patients, it is recommended that BP be measured in both the morning and evening.
- If the elderly person's medication is not known because the prescription record is lost, a doctor or medical staff should be consulted.
- If an elderly person has a headache, palpitations, chest symptoms, and/or flushing, BP should be measured immediately and medical staff consulted.
- No smoking and a low-salt diet are also recommended. Endeavors must be made to ensure the elderly maintain physical activity (e.g. any exercise for at least 30 minutes a day).

2. Stroke/cerebrovascular disease (CVD)

Cerebrovascular accidents occur suddenly due to a disturbance in the blood supply to the brain and lead to a loss of cerebral function.

Signs and symptoms of stroke/CVD

If elderly people have any of the following symptoms, it is possible that they may have suffered a stroke/CVD. Consult medical staff immediately, because these situations may become medical emergencies.

- Symptoms starting suddenly and lasting from a few seconds to minutes
- Headache (mild to severe)
- Vertigo and/or dizziness (with nausea/vomiting on occasion)
- Disturbance of consciousness (snoring-like breathing, semiconscious state/coma)
- Motor disturbance including hemiparesis/hemiplegia/numbness, exhaustion, muscle weakness of the face (central facial palsy), drooling from one corner of the mouth, eyelid drooping (ptosis)
- Aphasia (difficulty with verbal expression, auditory comprehension)
- Sensory or vibratory disturbance (on one side)
- Visual field defect/hemianopia, double vision/polyopia
- Loss of balance when sitting, standing, or walking; loss of coordination.

Measures to prevent stroke/CVD in shelters

- First, medical staff and people around should be aware of elderly people who usually take medication for atherosclerotic diseases and/or lifestyle-related diseases (e.g. hypertension, diabetes, dyslipidemia, and cardiac diseases including atrial fibrillation).
- Also, people around should check on the elderly.

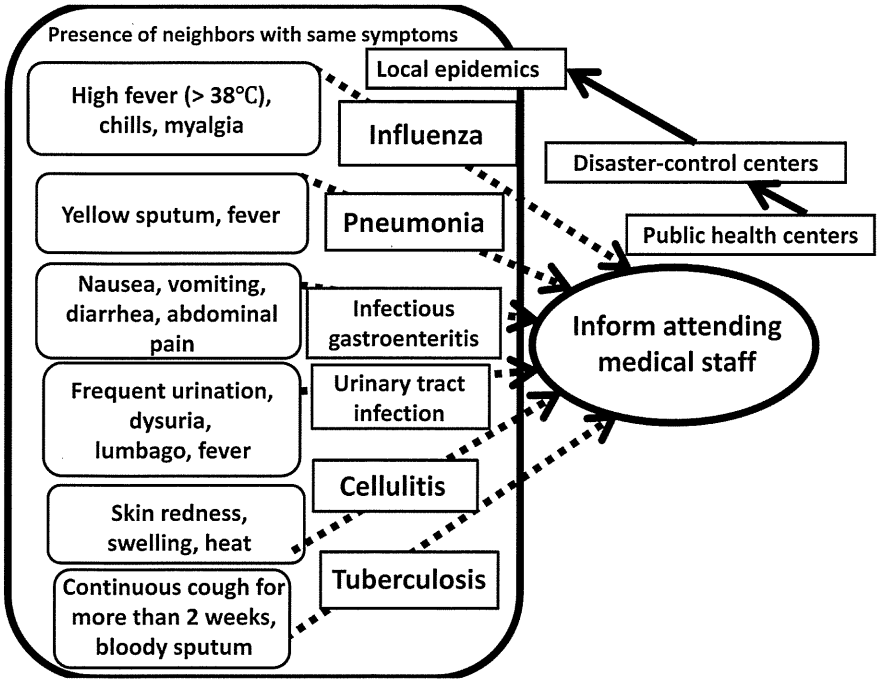

Figure 2 Measures to rapidly detect infectious diseases.

- Continue usual drugs including anticoagulation drugs if possible.
- In cases of unidentified medical conditions because of loss of an elderly person's prescription record, medical staff should be consulted.
- Anticoagulation drugs are generally essential. However, it is better to consult medical staff because it is necessary to check for external wounds or bleeding from the gastrointestinal tract, including stress-induced ulcer.
- CVD is strongly associated with hypertension. Measure BP regularly.
- No smoking is strongly recommended.
- Drink any fluid, including a lot of water, to prevent dehydration.
- A low-salt diet is strongly recommended. Endeavor to take dietary fiber in vegetables including seaweed and mushrooms.
- Endeavor to do any type of exercise or walk for at least 30 minutes a day regularly.
- Prevent constipation.
- Be careful about changes in temperature, especially in winter.

3. Infectious diseases

Signs and symptoms of infectious diseases

It is useful to have information on epidemics of infectious diseases in stricken areas before and after disasters, in order to quickly detect illness. In particular, this measure is beneficial for diseases, such as influenza, food poisoning and viral gastroenteritis, with a short incubation time from infection to the onset of symptoms (i.e. several hours up to 3 days). Pay special attention to elderly persons with these symptoms and immediately inform medical staff if there is suspicion that an elderly person has such an illness. In relation to this point, it is important to collect epidemiological information from district public health centers through disaster-control centers (Fig. 2).

In fact, many evacuees in shelters developed vomiting and diarrhea after the 2007 Noto Peninsula Earthquake. It was possible to immediately predict an outbreak of norovirus gastroenteritis among evacuees since a local epidemic of this infectious disease had already been observed in the Noto area before the quake.

However, local epidemics are not always useful for detecting infectious diseases, particularly those with a long incubation period (i.e. several months up to 2 years) such as pulmonary tuberculosis.

Measures to prevent transmission of infectious agents in shelters

- The environment in shelters induces an increased risk for outbreaks of infectious diseases because many evacuees are living together in a very limited space.
- It is very important to wash hands and gargle as standard precautions. Please apply hand disinfectant when it is not possible to use water. It is essential to wash hands or use hand disinfectant after using the toilet.
- NMCP, PHN, or CSW should not directly touch human bodily fluids (e.g. blood, urine, feces, nasal discharge, and sputum) with their hands because the fluids may include infectious microorganisms.

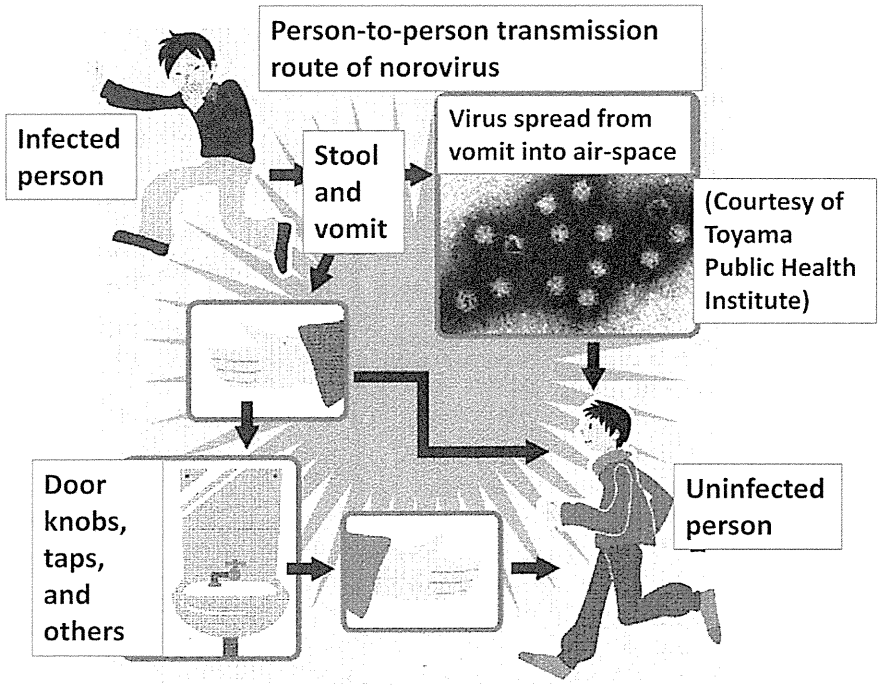

Figure 3 Person-to-person transmission route of norovirus.

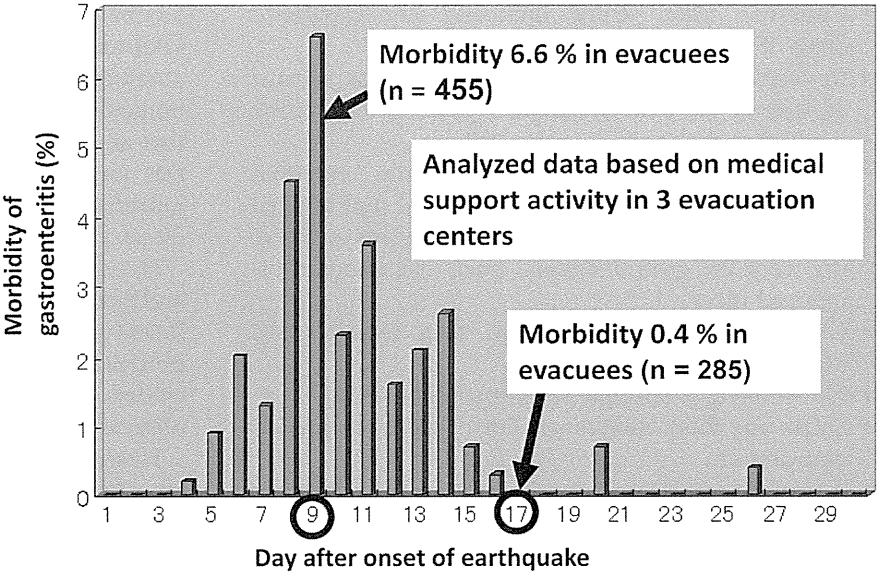

Figure 4 Morbidity of gastroenteritis in evacuees in shelters after the 2007 Noto Peninsula Earthquake.

If NMCP, PHN, or CSW are aware that the environment (floors in shelters, portable toilets, and temporary water-suppliers) has been contaminated with vomitus or diarrheal matter, contact medical staff. Do not clean the contaminated environment yourself. The staff can deal with this using 0.1% sodium hypochlorite disinfectant.

- Norovirus can spread via person-to-person transmission and lead to gastroenteritis outbreaks (Fig. 3).[7] However, it is unnecessary to isolate subjects with gastroenteritis from the stricken areas. The outbreak in shelters after the Noto quake was quelled after one week of interventions including personal hand hygiene, gargling, and the use of disinfectant on environmental surfaces (Fig. 4).[8]

In addition, respiratory hygiene (cough etiquette) is recommended to prevent respiratory infections.[9] With respect to coughing, rhinorrhea, sneezing, and sputum, please instruct evacuees to behave as follows: (i) use a tissue to cover your mouth and nose when you cough or sneeze (Fig. 5); (ii) drop used tissuew in a special waste basket; and (iii) wash your hands with soap and warm

Figure 5 Respiratory hygiene (cough etiquette).

water or clean with alcohol gel or wipes since your hands may be contaminated with secretions (Fig. 5). Elderly people who frequently cough or sneeze should be asked to wear a surgical mask provided by medical staff. Please keep a distance of more than 1 m between symptomatic subjects and others.

4. Dehydration

Signs and symptoms of dehydration

If an elderly person has some of the more severe symptoms of dehydration listed below, call medical staff immediately.

- Muscle weakness
- Physical fatigue
- Increased body temperature
- Decreased urine production
- Dry skin, even under the armpits.

Measures to prevent dehydration in shelters

- When elderly people feel thirsty, they are already dehydrated, so do not restrict water intake.
- To prevent dehydration, an elderly person without particular illness such as heart failure or kidney failure simply needs to replenish fluids with at least one liter of water per day.
- When elderly people have any of the risks for dehydration listed in Table 1, they should be carefully assessed by a doctor for dehydration.

Table 1 Risks for dehydration in the elderly

Inability to feed oneself
Appetite loss (decrease in food intake)
Swallowing problems
Diarrhea or vomiting
Thirsty or dry mouth
Taking a diuretic
Increased body temperature
Decreased urination
No air conditioning/not using air conditioning
Limitation of water intake to avoid frequent urination

5. Malnutrition

Signs and symptoms of malnutrition

When an elderly person has any of the risks for malnutrition listed below, the person should be carefully assessed by medical staff.

- Consumed less than half the usual dietary intake for at least 1 week
- Diarrhea or vomiting for more than 2 or 3 days
- Decrease in body weight of more than 5% for 2 weeks
- Insufficient intake or dysphagia due to inadequate food
- Receiving enteral or parenteral nutrition.

Measures to prevent malnutrition in shelters

The following general precautions to prevent malnutrition should be considered:

- Adequate food supply
- Adequate types of food consumed
- Adequate feeding assistance
- Dental issues such as gum disease, cavities, and poorly fitting dentures
- Regular assessment of nutritional status and weight loss.

6. Gastrointestinal disorders

Signs and symptoms of gastrointestinal disorders

When elderly evacuees have any of the signs and symptoms of gastrointestinal disorders listed below, they should be carefully assessed by medical staff.

- Upper central abdominal pain after meals (on suspicion of stomach ulcer)
- Upper central abdominal pain when hungry (on suspicion of duodenal ulcer)
- Gastric discomfort

- Appetite loss
- Heartburn
- Tarry (black) stool or blood in the stool.

Measures to prevent gastrointestinal disorders in shelters

The following general precautions to prevent gastrointestinal disorders should be considered:

- Avoid psychological stress.
- Eat substantial meals at regular mealtimes.
- Wash hands, gargle, and disinfect cooking utensils to prevent infectious enteritis.
- Flush or discard any vomit, and change diapers with rubber gloves while wearing a flu mask. Thoroughly clean and disinfect contaminated surfaces with a bleach-based household cleaner immediately after an episode of illness.
- Drink sufficient liquid and take a lot of exercise to avoid constipation.
- Do not ignore the urge to defecate and maintain a regular bowel habit.

7. Diabetes mellitus (DM)

7–1). Hyperglycemia

Signs and symptoms of exacerbation of DM

If elderly people have any of the symptoms described below, their DM might be worsening. Please contact medical staff if any of the following symptoms are detected:

- Frequent urination
- Increasing incontinence
- Thirst
- Fatigue
- Not looking well.

Measures to prevent exacerbation of DM in shelters

- Eat meals regularly and take medication with meals.
- Patients with DM type 1 should not skip basal insulin injections.
- Drink enough water to prevent dehydration.
- If someone has a fever or little appetite, monitor blood glucose more frequently than usual or consult a doctor promptly.

7–2). Hypoglycemia. In addition, if elderly evacuees are taking hypoglycemic medication, be alert for symptoms of hypoglycemia.

Signs and symptoms of hypoglycemia

The symptoms described below might be caused by hypoglycemia. Please contact medical staff if any of the following symptoms are detected:

- Strong feeling of hunger
- Cold sweats
- Palpitations
- Weakness
- Sleepiness
- Slurred speech
- Blurred vision
- Convulsion.

Measures to prevent hypoglycemia in shelters

- Elderly people should avoid exercise or working when hungry.
- Eat meals regularly.
- Eat carbohydrates (e.g. rice, bread, noodles, or potatoes).
- If people cannot eat a meal, they should reduce or skip their hypoglycemic medication.
- Set a higher goal of glucose control (150–200 mg/dL) than usual.

Tips to treat hypoglycemia in shelters

- NMCP, PHN, or CSW should ask those with the above symptoms to take a glucose tablet.

8. Bronchial asthma

Signs and symptoms of exacerbation of bronchial asthma

If elderly people have any of the following symptoms, bronchial asthma might be worsening. Please contact medical staff if the following symptoms are detected:

- Paroxysmal wheezing or coughing, or reoccurrence of these symptoms
- Breathlessness during the night
- Breathlessness when moving, speaking, or lying down
- Cyanosis or edema
- Drowsiness.

Measures to prevent exacerbation of bronchial asthma in shelters

- Let NMCP, PHN, CSW, or medical staff know that if an elderly person is taking medication.
- Continue taking medicine.
- Wash your hands and gargle regularly, wear a mask if available, and be careful about infectious diseases such as colds.
- Keep warm.

9. Chronic obstructive pulmonary disease (COPD)

Signs and symptoms of exacerbation of COPD

If an elderly person has any of the following symptoms, COPD might be worsening. Please contact medical staff if the following symptoms are detected:

- Increased respiratory rate and shortness of breath
- Worsening of dyspnea on exertion or at rest
- Increased frequency or severity of cough and excessive sputum production
- Mucopurulent sputum (change in sputum character)
- Cyanosis or edema
- Drowsiness.

Measures to prevent exacerbation of COPD in shelters

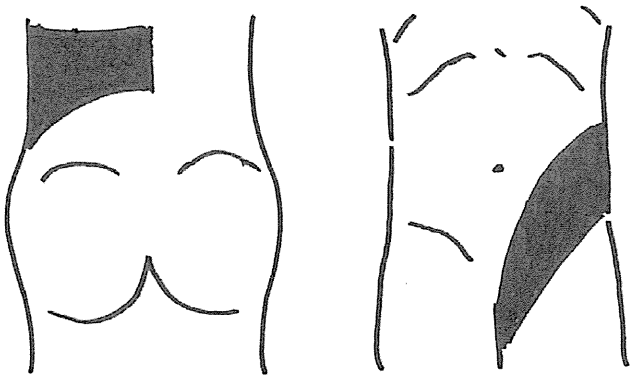

Figure 6 Ares where pain occurs due to urinary tract diseases.

- Let NMCP, PHN, CSW, or medical staff know if an elderly person is taking medication.
- Continue taking medication and inhaling bronchodilators.
- Avoid exposure to smoke and dust.
- Try to wash your hands and gargle regularly.
- Keep warm and do not stay in the cold.

10. Chronic kidney disease (CKD)

Signs and symptoms of CKD

If elderly evacuees have any of the following symptoms, CKD might be worsening. Please contact medical staff if the following symptoms are detected:

- Inactivity, fatigue, or weakness
- Edema
- Appetite loss
- Nausea and/or vomiting
- Pruritus.

Measures to prevent CKD in shelters

- Let NMCP, PHN, CSW, or medical staff know if an elderly person is taking medication.
- Continue taking medicine.
- Have regular blood pressure checks.
- Restrict salt intake.
- Drink enough water to prevent dehydration.
- Keep warm.
- Be careful about infectious diseases such as colds.

11. Urinary diseases

Signs and symptoms of urinary diseases

If an elderly person experiences some of the more severe symptoms of urinary diseases listed below, call medical staff immediately.

- Pain on urination
- Lower abdominal pain (Fig. 6)
- Back pain, lumbago (Fig. 6)
- No urination for half a day or longer
- Distention of lower abdomen
- Bloody urine
- Cloudy smelly urine
- Frequent urination
- Incontinence
- High fever (in cases of pyelonephritis, 38°C or higher)
- Limiting water intake in order to avoid frequent urination or incontinence.

Measures to prevent urinary diseases in shelters

- Replenish fluids with at least one liter of water per day in persons without particular illness such as heart failure or kidney failure.
- Do not avoid going to the toilet.

12. Post-traumatic stress disorder (PTSD)

Signs and symptoms of PTSD

Please contact medical staff if an elderly person has any of the following symptoms. Please contact medical staff if the following signs are detected:

- Sudden change in personality
- Absent-mindedness and the inability to respond quickly
- Restlessness
- Frequent hyperventilation
- Frequent palpitations
- Panic attacks.

Measures to prevent PTSD in shelters

- If elderly people feel distressed or pain, they should confide in someone (a medical staff member, NMCP, PHN, or CSW).
- It may be necessary for the elderly to take medication if they cannot sleep or feel distressed and there is no alternative.

13. Depression

Signs and symptoms of depression

It is not unusual for an elderly person to experience grief after suffering from severe stress. Please contact a medical staff member if the following symptoms of depression are detected:

- Cannot help thinking of bad things
- Not knowing what to do despite actually having many things to do
- Feeling too sluggish to move, although the results of a medical checkup and blood tests are normal
- Unable to sleep at night
- Always thinking of dying.

Measures to prevent depression in shelters

- It is important to maintain a routine, including waking up and going to sleep at the same time daily.
- If elderly people feel distressed or pain, they should confide in someone (a medical staff member, NMCP, PHN, or CSW).

- It may be necessary for the elderly to take medication if they cannot sleep or feel distressed and there is no alternative.
- If an elderly person has been attending a clinic for the treatment of depression, please tell a medical staff member. It is important that the person continues to receive treatment.

14. Behavioral and psychological symptoms of dementia (BPSD)

Signs and symptoms of BPSD

Please contact a medical staff member if the following symptoms of dementia are detected:

- Restlessness and speaking in a disjointed manner
- Paranoid or having delusions (e.g. a false idea of being robbed)
- Becoming angry or starting to cry suddenly.

Measures to prevent BPSD in shelters

- Create an environment in which dementia patients can spend time with familiar people.
- Prepare a quiet environment so that dementia patients can get adequate sleep at night.
- Preparations should be made so that a dementia patient can be transferred to a professional medical institute when psychological symptoms or behavioral abnormality is observed.

15. Delirium

Signs and symptoms of delirium

Please contact medical staff if any of the following physical symptoms are detected in elderly persons who had previously been well and not experienced any decrease in cognitive function:

- Speaking or behaving in an erratic manner
- Absent-mindedness or being distracted
- Emotional instability (e.g. becoming angry, starting to cry, or getting excited suddenly).

Measures to prevent delirium in shelters

- Particular attention should be paid to dehydration, infections, and other underlying physical disorders, which can cause delirium in the elderly. Please be aware that elderly people with physical disorders are potential delirium patients.
- Keeping the elderly company and talking to them to provide stimulation are effective for preventing lethargy during the daytime. At night, create a quiet environment to help them achieve a regular sleeping pattern.

16. Dental diseases

Signs and symptoms of dental diseases

If an elderly person is showing some of the more severe symptoms of dental disease listed below, call medical staff immediately.

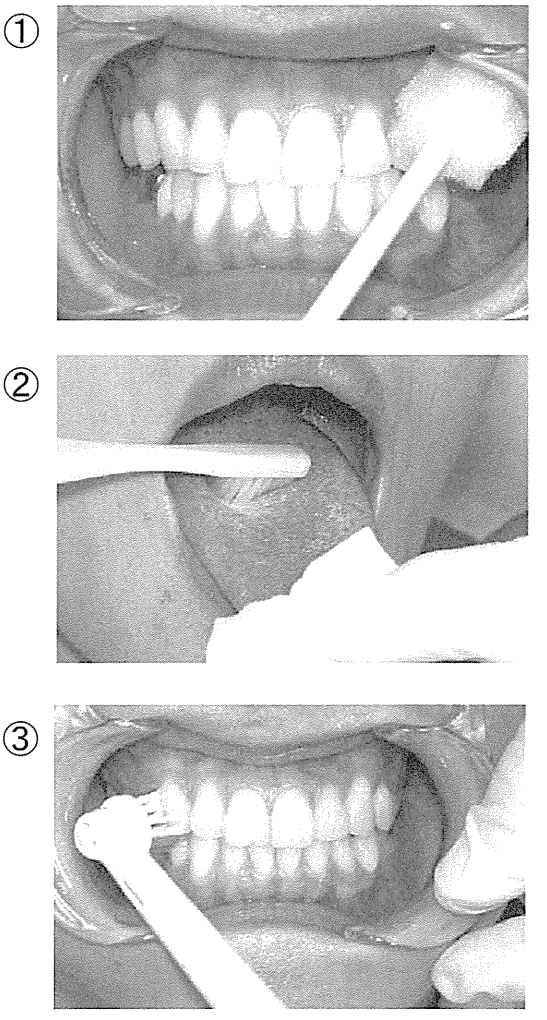

Figure 7 Systematic oral care program.

- Pain from dental caries
- Swelling and bleeding of the gingival
- Severe halitosis
- Fur on the tongue.

Measures to prevent dental diseases in shelters

- Keep cleaning the mouth.
- Brush the teeth every day.
- Those who are unable to do the above independently need to receive a systematic oral care program (Fig. 7)[10]
  1. Remove oral-mucosal and gingival saburra by using an oral care sponge for one minute.
  2. Remove fur from the tongue with a tongue brush for half a minute.
  3. Remove bacterial flora from the tooth surface with an electric toothbrush for 2.5 minutes, if an electric power supply is available.
  4. Rinse the mouth for 1 minute.

17. Functional inactivity

Signs and symptoms of functional inactivity

Elderly people often may not complain of their subjective symptoms accurately, or they may not be aware of a decline in their health. Thus, it is important for NMCP, PHN, or CSW to be aware of elderly persons' health conditions as well as the whereabouts of subjects who require support and/or nursing care.

If an elderly person shows some of the more severe symptoms of functional inactivity listed below, call medical staff and/or shelter staff.

- Being isolated, with no attempt to communicate
- Narrow range of activities and staying indoors
- Lying down all day long

Measures to prevent functional inactivity in shelters

- Encourage subjects to greet each other and make small talk in the shelter.
- Exercise regularly.
- Bend and stretch your arms and legs often, even in the narrow living space in the shelter.
- NMCP, PHN, or CSW should evaluate the reserve capability of elderly subjects with functional inactivity promptly.

18. Decubitus

Signs and symptoms of decubitus

NMCP, PHN, or CSW should actively survey the onset of decubitus ulcer, particularly on the hip, the backbone, the heel, and the back of the head, in bedridden subjects. Since this illness needs long-term management, contact medical staff and arrange transport to the hospital.

Measures to prevent decubitus in shelters

- Change bedridden subjects' position every 2 hours a day.
- Keep the skin clean.

19. Heat stroke

Signs and symptoms of heat stroke

In summer, pay special attention to heat stroke in elderly people in shelters. The main features are hot skin (body temperature ≥ 40°C) without sweat and drowsiness. Call medical staff immediately as this condition will cause fatality.

Measures to prevent heat stroke in shelters

- Keep cooling the neck or under the arms.
- Do not restrict water intake.

II. Signs of acute diseases in elderly

If any of the following symptoms is encountered in the elderly, they may be severely ill due to acute disease. These signs of acute diseases are sensitive enough to rapidly detect a severe state in elderly evacuees. NMCP, PHN, or CSW should consult attending medical staff immediately. Asterisks denote signs indicating the need for emergency transport.

1. Disturbance of Consciousness (Japan Coma Scale [JCS] Scoring)

- Rousable by being spoken to but reverts to previous state if stimulus stops (JCS II-10)
- Rousable with loud voice but reverts to previous state if stimulus stops (JCS II-20)
- Rousable only by repeated mechanical stimuli (JCS II-30)

* Unrousable using any forceful stimuli but responds to avoid the stimuli (JCS III-100 to III-300).

2. Shock

* Anemia (e.g. pallor of lips and/or nails)
* Bleeding due to external injuries
* Disturbance of consciousness (JCS III-100 to III-300)

- Abnormal skin turgor, a physical sign of dehydration
- Dry tongue

* A decline in BP: systolic BP < 90 mmHg
* An increase or decrease in pulse rate (i.e. resting pulse rate of more than 120 beats/minute or less than 50 beats /minute).

3. Dyspnea

- Shallow and rapid respiration, puffing (shallow breathing)
- Shoulder breathing (accessory muscle use)
- Flaring of wings of the nose and dilated nostrils (nasal alar breathing)
- Violet color to lips and nails (cyanosis)
- Wheezing or whistling while breathing (wheeze/stridor)
- Sleeping with the upper body raised in order to breathe (orthopnea)
- Weak breathing, suspended on occasion (apnea)
- Pursing the lips when exhaling (pursed lips breathing)

* Collapse of supraclavicular or intercostal spaces when inhaling (inspiratory retraction)
* Distension of the abdomen/shrinking of the chest when inhaling, and shrinking of the abdomen/ distension of the chest when exhaling (seesaw breathing)
* Obvious asymmetric movement of the chest during respiration
* Respiratory rate less than 10/minute or more than 30/minute.

4. Acute abdomen

* Uncontrollable abdominal pain

* Hematemesis, vomiting blood
* Tarry (black) stool, visibly bloody stools not due to hemorrhoids
* Frequent vomiting
* Abdominal swelling, abdominal distension
* Severe anemia (pallor of face or lips).

5. Neurological abnormalities.

* Motor disturbance including hemiparesis/hemiplegia/numbness, muscle weakness of the face (central facial palsy), eyelid drooping (ptosis)
* Aphasia (difficulty with verbal expression, auditory comprehension)
* Sensory or vibratory disturbance (unilateral)
* Visual field defect/hemianopia, double vision/polyopia
* Loss of balance when sitting, standing, or walking; loss of coordination
* Pupils not isocoric
* Convulsions or cramps.

6. Chest pain

* Chest pain, oppression, burning, or choking sensation in anterior chest
* Increasing frequency and worsening angina attacks compared with 2 weeks earlier
* Chest symptoms even at rest or at night
* Continuation (without improvement) of these symptoms in spite of aspirin or nitroglycerine use
* Duration of chest symptoms: more than 20 minutes.

7. Hypertensive emergency

* Hypertension (systolic BP ≥ 200 mmHg).

8. High fever

- Shivering (shaking chills) coinciding with high fever and potential severe infectious diseases (i.e. bacteremia)
- Burning forehead and poor response to being called.

9. Hematuria

- Red and/or tea-colored urine.

III. Symptoms of anxiety in elderly in shelters

If an elderly person is showing some of the symptoms listed below, immediately ask medical staff to assess the presence of serious diseases.

1. Dysphagia, difficulty in swallowing

- Coughing or breathing in food while swallowing
- Aspiration (i.e. escape of food or liquid into the lungs) or labored breathing while swallowing
- Recurrent pneumonia, respiratory infections, or choking experiences
- Wet vocal quality ("gurgly" voice) after swallowing
- Irritability during feeding or failure to thrive
- Prolonged feeding times (more than one hour)
- Unexplained weight loss.

2. Diarrhea

- Subject has diarrhea and a fever.
- Similar symptoms (diarrhea) are observed in surrounding evacuees.
- If diarrhea persists for two days or more, ask medical staff to assess, in order to avoid dehydration.

3. Constipation

- Change in bowel habit
- Constipation with abdominal pain
- Constipation for 2 or more days.

Discussion

On 11 March 2011, an earthquake with a 9.0 magnitude occurred off of Japan's Pacific coast and hit northeast Japan. The earthquake was followed by huge tsunamis, which destroyed many coastal cities.[11,12] A total of 14 841 people died in these events, and 10 063 persons are still missing as of 6 May 2011.[13] In addition, 109 086 homes were completely or partially destroyed, and 3970 roads were damaged.[13] There are still 119 967 displaced people (down from approximately 470 000 on March 14) living in shelters because of disrupted community utility services and/or health risks related to the nuclear power plant accidents in Fukushima.[13–15] Specifically, 37 482, 35 923, and 25 501 persons took refuge into the 357, 403, and 157 evacuation centers located in Iwate, Miyagi, and Fukushima prefectures, respectively.[13]

There were several reports concerning medical needs following the 2011 earthquake off the Pacific coast of Tohoku. For instance, reports have highlighted the importance of managing the exacerbation of chronic illnesses (e.g. hypertension, cardiac disease, DM, and chronic pulmonary disease) as well as dehydration in elderly evacuees, especially as it was difficult to source enough medication for their chronic illnesses.[16,17] Health workers should pay attention to the possible spread of acute diseases such as gastroenteritis, diarrhea, and other illnesses associated with dirty water.[16] In addition to physical health problems, it is important to rapidly detect long-term mental problems in the elderly (e.g. PTSD, depression, BPSD, and delirium) triggered by the disaster.[16,17] Medical specialists have indicated

that thousands of victims will be in need of long-term counseling to cope with the loss of their relatives, friends, and homes.[16]

There were some cases that previous guidelines failed to cover because of the unexpected phenomena following the Tohoku earthquake. Therefore, it is essential that we are mindful of the difficulties in establishing general guidelines that can cover a wide (and unexpected) range of disasters. Feedback regarding the booklets will need to be collected from NMCP, PHN, or CSW to assess the guidelines' usability. We further need to investigate the morbidity and mortality from disaster-related illnesses among the elderly in order to clarify efficacy of these guidelines.

Acknowledgements

The authors thank Drs Yukihiro Watoh, Takeshi Nakahashi, Shigeru Kudoh, Masashi Okuro, Kenta Hara, Hisafumi Yasuda, and Yasuyoshi Ouchi (president, Japan Geriatrics Society), Mr Hiroto Minamide, Ms Takako Ichihara, and Ms Kaori Nakamura for their helpful assistance. The authors also thank Dr Yasunori Sumi (Department of Dental Surgery, National Center for Geriatrics and Gerontology, Obu, Japan) for providing Figure 7.

Conflict of interest

None of the authors has any financial disclosure to report. This work was supported by research funding for comprehensive research on aging and health (H22-003) from Ministry of Health, Labour, and Welfare of Japan.

References

1 Tanida N. What happened to elderly people in the great Hanshin earthquake. *BMJ* 1996; **313**: 1133–1135.
2 Liu C, Linde AT, Sacks IS. Slow earthquakes triggered by typhoons. *Nature* 2009; **459**: 833–836.
3 Shuto N, Fujima K. A short history of tsunami research and countermeasures in Japan. *Proc Jpn Acad Ser B Phys Biol Sci* 2009; **85**: 267–275.
4 Kario K, Matsuo T, Kobayashi H *et al.* Earthquake-induced potentiation of acute risk factors in hypertensive elderly patients: possible triggering of cardiovascular events after a major earthquake. *J Am Coll Cardiol* 1997; **29**: 926–933.
5 Sato M, Fujita S, Saito A *et al.* Increased incidence of transient left ventricular apical ballooning (so-called "Takotsubo" cardiomyopathy) after the mid-Niigata Prefecture earthquake. *Circ J* 2006; **70**: 947–953.
6 Starkey J, Maeda S. Earthquake in Japan. *Lancet* 2011; **377**: 1653.
7 Takahashi T. Prevention of norovirus infection. *Gekkan Hokkoku Actus* 2007; **211**: 36–39. (in Japanese).
8 Nomura K, Murai H, Nakahashi T *et al.* Outbreak of norovirus gastroenteritis in elderly evacuees after the 2007 Noto Peninsula earthquake in Japan. *J Am Geriatr Soc* 2008; **56**: 361–363.
9 Siegel JD, Rhinehart E, Jackson M *et al.* The Healthcare Infection Control Practices Advisory Committee. Guideline for isolation precautions: preventing transmission of infectious agents in healthcare settings 2007. [Cited 06 May 2011.] Available from URL: http://www.cdc.gov./ncidod/dhqp/pdf/guidelines/Isolation2007.pdf).
10 Sumi Y. A systematic oral care program for frail elderly persons that should be performed by dental hygienists. *J Dent Hyg* 2009; **29**: 1322–1326. (in Japanese).
11 Normile D. Japan disaster. Waves of destruction. *Science* 2011; **331**: 1376.
12 Shibahara S. The 2011 Tohoku earthquake and devastating tsunami. *Tohoku J Exp Med* 2011; **223**: 305–307.
13 Emergency Disaster Countermeasure Headquarters, National Police Agency of Japan. *Damage Situation and Police Countermeasures Associated with 2011 Tohoku District-off the Pacific Ocean Earthquake*. Tokyo: National Police Agency of Japan, Emergency Disaster Countermeasure Headquarters, 2011. [Cited 06 May 2011.] Available from URL: http://www.npa.go.jp/archive/keibi/biki/higaijokyo.pdf.
14 Matsumoto M, Inoue K. Earthquake, tsunami, radiation leak, and crisis in rural health in Japan. *Rural Remote Health* 2011; **11**: 1759.
15 Christodouleas JP, Forrest RD, Ainsley CG *et al.* Short-term and long-term health risks of nuclear-power-plant accidents. *N Engl J Med* 2011; **364**: 2334–2341.
16 McCurry J. Japan: the aftermath. *Lancet* 2011; **377**: 1061–1062.
17 Furukawa K, Arai H. Earthquake in Japan. *Lancet* 2011; **377**: 1652.

Geriat. Med. 49(12) : 1447～1451, 2011

Seminar

6．災害時における高齢者高血圧の管理と治療

飯島 勝矢

KEY WORD

- 内服薬の中断
- 肉体的・精神的ストレス
- 交感神経系の賦活化
- 概日生態リズムの乱れ

SUMMARY

地震などの大災害時には脳心血管病の発症・増悪が起こりやすく，最終的には災害関連死に至るケースも少なくない．そこには血圧上昇という問題が根底にあり，内服薬の中断，避難所生活という急激な環境の変化による脱水や概日生態リズムの乱れ，肉体的・精神的ストレスによる交感神経の賦活化など，様々な要因が重複する．災害弱者といわれる高齢者は普段から数多くの疾患やリスクを抱えているからこそ，発災後急性期に的確な判断が必要とされる．加えて，多職種による系列を超えた広域医療連携による迅速な対応も要求される．また，復旧する過程で医療だけではなく，社会的支援や見守りも含めた精神面への長期的サポートも欠くことはできない．

はじめに

震災列島・日本において，災害弱者とされる被災高齢者に対する医療対応は非常に重要であり，同時にまだ多くの課題を抱えている．今回，2011年3月11日に発生した東日本大震災(マグニチュード9.0)は，いい換えれば「大津波」震災といっても過言ではなく，大きな爪痕を残した．さらに慢性期に向けて被災高齢者の高血圧の管理の難しさとも直面している．

1995年に発生した阪神淡路大震災(8割が圧死・窒息死)と比較してみると，今回の東日本大震災では死者9割超が水死(溺死・6割が60歳以上)という結果からも，今回の特異性がよくわかる．今回の大震災のもう1つの特徴は，被災地がかなり広域にわたったこと，被災地は従来から医師不足が問題であった地域であること，被災地の中核病院自体が数多く被災したことからカルテなど多くの医療情報が失われてしまったこと，などもあったことから，降圧薬も含めた薬剤の現地配給にも問題を抱えた．

災害時の血圧上昇の機序および急性冠症候群への流れ(図1)

災害時は極度の精神的ストレスも加わるため，従来の高血圧患者の管理がより増悪したり，正常血圧であった高齢者の一過性血圧上昇が起こりやすい．一般的には，極度の精神的ストレス下に置かれるため，交感神経活性の賦活化が生じる．過剰なカテコラミン分泌はβ1アドレナリン受容体を刺激し，心拍数や心拍出量を増加させ，さらに血管収縮にも大きく基づき最終的に血圧上昇を惹起する．

発災後急性期には，以下のような様々な現象が惹起されやすく，急性冠症候群が起こりやすい[1]．

いいじま かつや(東京大学高齢社会総合研究機構)

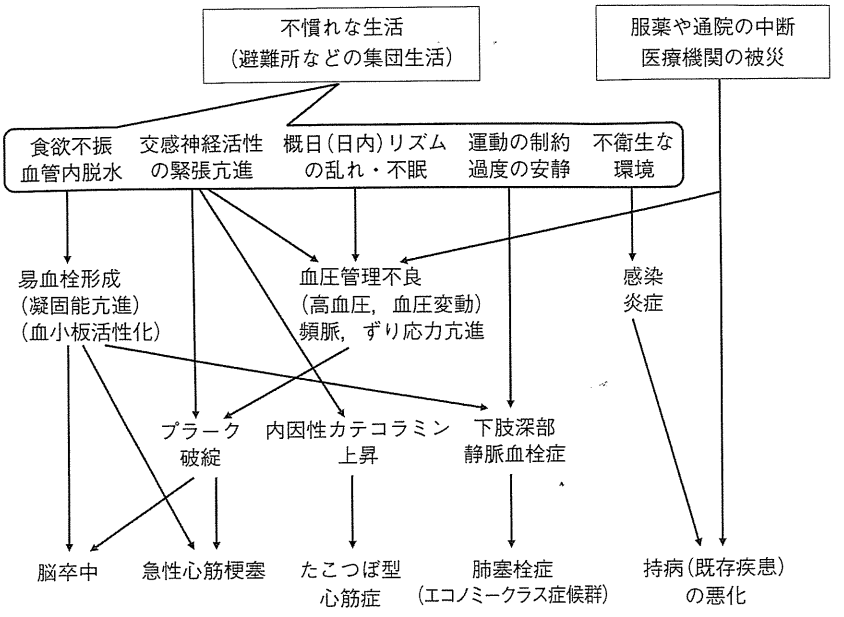

図1　様々な要因により引き起こされる災害後関連疾患および災害関連死

降圧薬の中断や医療機関の被災などによっても血圧管理が不良となりやすいが，それらに加え，不慣れな避難生活を背景に精神的ストレスや交感神経活性などにより，さらに血圧管理が不良になりやすい．

①急性のストレスが交感神経活性を亢進させ，頻脈や血管収縮に基づく血圧上昇を惹起する．同時に，血管壁にかかるストレスも上昇し，不安定プラークの破綻が引き起こされやすい．
②交感神経活性による凝固能の亢進と血小板の活性化により，血栓形成亢進が誘導される[2]．この機序には，D-dimmer や von Willebrand 因子（vWF），Tissue Plasminogen Activator (tPA)抗原などの上昇が大きく関わる．実際，ロサンゼルス Northridge 地震では，不安定プラークを有する症例が一斉に急性心筋梗塞を発症してしまったため，その結果，ハイリスク症例数が相対的に減少し，地震1カ月後からはむしろ急性心筋梗塞の発症が減少した[3]．
③避難生活においては脱水状態に傾きやすく，血栓形成亢進がより惹起されやい[4]．
④災害の突然発生により，生体の概日(日内)リズムが撹乱されやすい．
⑤循環器系の慢性疾患に対する通院継続および治療薬の中断にて再発しやすい．

災害時の血圧管理における精神的影響

表1に，災害時における高齢者高血圧管理をより難しくさせる様々な因子(ストレッサー)を示す．

治　療

高血圧管理への初期対応における一番重要なポイントは，①緊急性の高い降圧(例えば180 mmHg 以上)の場合の対応，②緊急的な降圧は不要であるが，中断した降圧管理をいかに再開させるか，さらには降圧治療を再開する必要のある高齢者の選別，などが重要であろう．災害後に血圧上昇をみせた場合，多くは一過性であり，大半は4～5週間程度で安定する[5]．また，高齢者は個体差が大きく，慢性疾患の有無でも方針が変わるため，特に個別治療が重要になってくる．

降圧治療のフローチャートを**図2**に示す[6]．

表1　災害時における高齢者高血圧管理をより難しくさせる様々な因子(ストレッサー)

＜身体的要因＞
①厳しい環境(猛暑や寒さ)への曝露
②ライフラインの途絶や被災地の片づけなどによる肉体的負担の増加
③不眠，疲労
＜心理的要因＞
恐怖，不安，悲しみ，悲嘆・絶望・喪失，怒り，罪責などの不安定な感情が惹起される
①地震の揺れや音，火災などの体感と，その後の断続的に続く余震への恐怖・不安
②悲嘆や絶望(家族の死亡，家屋倒壊，財産の喪失，など)
③目撃による精神的ストレス(死体，火災，家屋の倒壊，人々の混乱，など)
④罪責(自分だけが生き残ったこと，適切に振る舞えなかったこと，などへの反省：いわゆるサバイバーズ・ギルト)
⑤周囲に対する怒り(援助の遅れ，情報の混乱，など)
⑥過失による災害の場合の過失責任機関・責任者に対する怒り
⑦慣れない避難所生活(新しい居住環境や集団生活などへのストレス)
ライフラインの停止・復旧への遅れに対する苛立ち
⑧慢性疾病の増悪や新たな疾病・障害の出現に対する悩み
＜そのほか＞
①薬剤の紛失による中断
②診療所や医療機関への通院継続の中断(日常生活の破綻)
ちなみに，水分摂取不足による血管内脱水も血圧管理を難しくさせる．
(断水およびプライバシーがない避難所において，トイレを我慢してしまう)

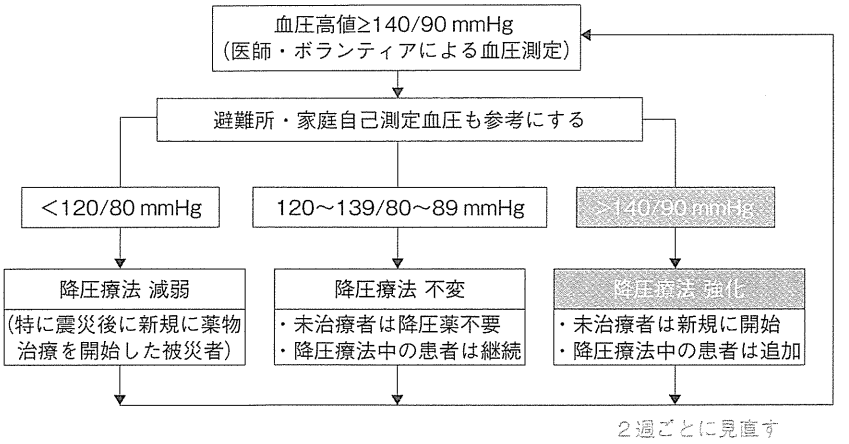

図2　災害時の降圧治療フローチャート(文献6より抜粋)

まずは収縮期血圧 150 mmHg 以下を目安にして，最終的には通常どおり収縮期血圧 140 mmHg を目指す．しかし，緊急度，脱水や栄養状態，今までの治療歴など，幅広く全体の情報を把握した上で投薬を開始するかどうか判断する．特に，被災前に降圧治療を受けていた高齢者でも，収縮期血圧 140 mmHg 以下ならば軽率に降圧薬の継続を行わずに，血圧測定を繰り返した上で治療再開の必要性をよく考慮する．そのためにも，自動血圧測定をうまく用いて遠隔管理を行い，現地の医療機関との連携のもと，血圧管理不良の被災高齢者をより早く管理するネットワークの構築も今後必要であろう．

1．薬物治療

緊急性がない限り，①災害前にもともと服用していた降圧薬を可能な限り継続するよう配慮する，②同じ降圧薬を継続できない場合は，速やかに同系統の降圧薬で対応する，この2点について配慮する．しかしながら，白衣効果も誘導されやすく，また後期高齢者などでは血圧の短期降圧による相対的臓器虚血を避けるため，降圧薬使用開始の必要性を十分検討する．また，長期的に漫然と投与が継続されることも避けなければならない．そのためにも，少なくとも複数回の血圧測定値で判断し，長期的に継続する[7]．

高齢者高血圧に対する第一選択薬とされているのは，長時間型カルシウム拮抗薬，アンジオテンシンⅡ受容体拮抗薬(ARB)/ACE 阻害薬などのレニン・アンジオテンシン系(RA 系)抑制薬，少量の降圧利尿薬である．高血圧性臓器障害や冠動脈狭窄を伴う狭心症の有無などにより降圧薬の選択は変わるが，被災直後の緊急時において降圧したい場合，もしくは従来の降圧薬の内容が不明な場合に関しては，少量のカルシウム拮抗薬(もしくは腎機能に配慮しながらARB)を用いる．必ず連日にわたり血圧チェックを行う．

また，避難生活において水分摂取が不十分なことによる血管内脱水の高齢者が少なくないため，安易には降圧利尿薬は使用しない．また，飲料水不足や嚥下機能低下などにも考慮し，口腔内崩壊錠も選択肢に入れる．

精神的ストレスにより惹起される高血圧には交感神経遮断薬が有用な場合がある．阪神淡路大震災のときにβ遮断薬を投与されていた症例は，非投与症例に比べて平均血圧が有意に抑えられていた[8]．しかし，特に高齢者は交感神経遮断薬により精神症状が悪化してしまう場合もあるため，投与には注意が必要である．実際に降圧目的で使用されたβ遮断薬(メトプロロール)が，PTSD 症例のフラッシュバックを惹起したとの報告もある[9]．

2．非薬物治療

1）急激な生活の変化へいかに順応させるか：～いわゆる話を聞いてあげる医療～

災害時のような極限状況を体験した犠牲者にみられるストレス刺激による精神障害により，血圧管理が非常に難しくなる．緊急性を冷静に判断し，短絡的に降圧薬を用いるのではなく，いかに早く順応させ精神的ストレスによる一過性血圧上昇を管理できるよう，精神的緊張を緩和するための対策を積極的に考慮する．そこには，場合により薬物治療および非薬物治療を検討する．また，慣れない避難所生活とはいえ，睡眠を十分取れるような環境作りを心掛ける．

2）避難生活における生活習慣の修正

高齢者高血圧は食塩感受性高血圧を示すことが多い．特に非難生活に入ると，今までの食生活が大きく変わり塩分摂取が増加するリスクがあるため，減塩(食塩制限6 g/日未満)に心掛ける必要がある．また，心血管病のない高血圧患者には，過度の安静などを予防する意味で，適度な有酸素運動を定期的に行うよう促す．禁煙も徹底させる．

今後の対策

①震災から2週間以上が経過した後も，3～4割の医療機関で診療ができなかったという報告があり，特に降圧薬による血圧管理の中断は非常に大きな問題である．よって，備えとして2週間分のストックを常備しておくことを高齢住民に周知するよう努力する．
②お薬手帳など常用薬剤の情報を手元に残しておくよう普段から啓発する．
③それらの情報が不明の場合は，短絡的に降圧薬を選択しない．

さいごに

避難所での避難者の年齢構成は6割以上が高齢者といわれており，行政，自治体，そして様々な医療機関や組織・団体により，系列を超えた幅広い広域連携を平時から想定・構築し，そ

して災害発生後には可及的速やかにそれを実行する必要がある．それらにより被災高齢者を災害後関連疾患や災害関連死から守り，そして潜在的能力の喪失を予防することにつながると考えられる．今後，被災高齢者の精神面だけではなく，血圧を中心とした健康管理においても長期的な疫学研究が必要であり，またわれわれはそれを担っている．わが国そして世界中の今後起こり得る大災害に対して，今回のわれわれの経験が活かさなければならない．

文　献

1) Kario K et al：Disasters and the heart：a review of the effects of earthquake-induced stress on cardiovascular disease. Hypertens Res **26**：355-367, 2003.
2) Kario K et al：Earthquake-induced potentiation of acute risk factors in hypertensive elderly patients：possible triggers of cardiovascular events after a major earthquake. J Am Coll Cardiol **29**：926-933, 1997.
3) Kloner RA et al：Population-based analysis of the effect of the Northridge earthquake on cardiac death in Los Angeles county, California. J Am Coll Cardiol **30**：1174-1180, 1997.
4) Inoue K：Venous thromboembolism in earthquake victims. Disaster Manage Response **4**：25-27, 2006.
5) 苅尾七臣：大災害時の心血管イベント発生のメカニズムとそのリスク管理—自治医科大学2004年提言より．心臓 **39**：110-119, 2007.
6) 矢野裕一郎ほか：災害時の血圧上昇とその対策．血圧 **18**：723-730, 2011.
7) 日本老年医学会：「高齢者災害時医療ガイドライン」(試作版)第2版, 2011. Available from：http://www.jpn-geriat-soc.or.jp/member/kaikai/koku_saigai-guideline.html.
8) Saito K et al：The great Hanshin-Awaji earthquake aggravates blood pressure control in treated hypertensive patients. Am J Hypertens **10**：217-221, 1997.
9) Reeves RR et al：Precipitation of PTSD with metoprolol for hypertension. Psychosomatics **44**：440-442, 2003.

(執筆者連絡先)　飯島勝矢　〒113-8656　東京都文京区本郷7-3-1　東京大学工学部8号館701　東京大学高齢社会総合研究機構

第53回日本老年医学会学術集会記録
〈パネルディスカッション4：高齢者災害時医療～避難所からいかに高齢者を守るか～〉

2. 災害時高齢者医療対策
1）循環器疾患の対策とストレスによる誘因：今回の日本老年医学会の対応および使命

飯島　勝矢

Key words：高齢者災害時医療，震災関連死，要介護高齢者への医療支援，広域医療連携の構築
（日老医誌　2011；48：494-497）

はじめに

本国は地震，台風，津波などの様々な災害が多い国であり，特に高齢者災害時医療は重要である．今回の東日本大震災（2011年3月11日14：46発生：M9.0）は，言い換えれば大「津波」震災と言っても過言ではない．この大きな爪痕を残した大震災から約3カ月経過したが，これからの慢性期に向けても高齢者は大きなリスクと背中合わせであることを忘れてはならない．本稿では日本老年医学会の活動を総括するとともに，高齢者災害時医療に今後何を求められているのかを改めて考えてみたい．

今までとは大きく異なる今回の東日本大震災

阪神淡路大震災（1995年発生）と比較してみてもその違いがよく分かる（図1）．阪神淡路大震災では8割が圧死・窒息死であり，死者数は6,434人に上ったが，逆に行方不明は3人のみであった．Disaster Medical Assistance Team（DMAT）の創設の契機になり，地震による直接の死因ではなく，その後の様々な疾患発症により死亡した方々が14％に上ったことから「災害関連死」が改めて注目された．一方，今回の東日本大震災における特異性は，死者9割超が水死（溺死）であること，それによりDMATは2～4日で解散，3カ月経過した6月11日の時点で死者は15,413人であると同時に行方不明がいまだ8,069人に上ることである．今回は被災地がかなり広域に渡ったこともあり，避難者は最大48万人であり，震災関連死は524人（5月13日時点）との報告がある．

また，阪神淡路大震災と比較して医療面における今回のもう一つの大きな違いは，①被災地は従来から医師不足が問題であった地域であること，②被災地の中核病院自体が数多く被災したことから，カルテなど多くの医療情報が失われてしまったこと，③大規模災害時の通信手段が完全に途絶されてしまったこと，などである．

日本老年医学会の対応と活動

1）対策本部の立ち上げ

日本老年医学会では東日本大震災対策本部を3月18日に立ち上げた．そこで様々な分野に対する対応策が迅速に協議され，下記の活動を行ってきた．

2）『高齢者災害時医療ガイドライン』を公表

厚生労働省・長寿科学総合研究事業として平成22年度から『災害時高齢者医療の初期対応と救急搬送基準に関するガイドライン作成』の研究班が森本茂人先生（金沢医科大学・高齢医学）を研究代表者として立ち上げられた．本論文の筆者も研究分担員として作成した．3月22日に試作版ではあるが日本老年医学会のホームページ上で公表に踏み切った．

同時に『一般救護者用・災害時高齢者医療マニュアル』も同時に公表し（図2），実際に冊子体（約2万部）も各被災地へ配布されている[1]．その配布作業は，日本老年医学会会員の関連施設からの医療支援班や各都道府県の日本医師会医療班（JMAT）により協力を得た．さら

A step to reduce disaster-related illnesses based on various stress: What should we learn from the 2011 off the Pacific Coast of Tohoku Earthquake? —Report from Japan Geriatric Society—

Katsuya Iijima：東京大学大学院医学系研究科加齢医学講座

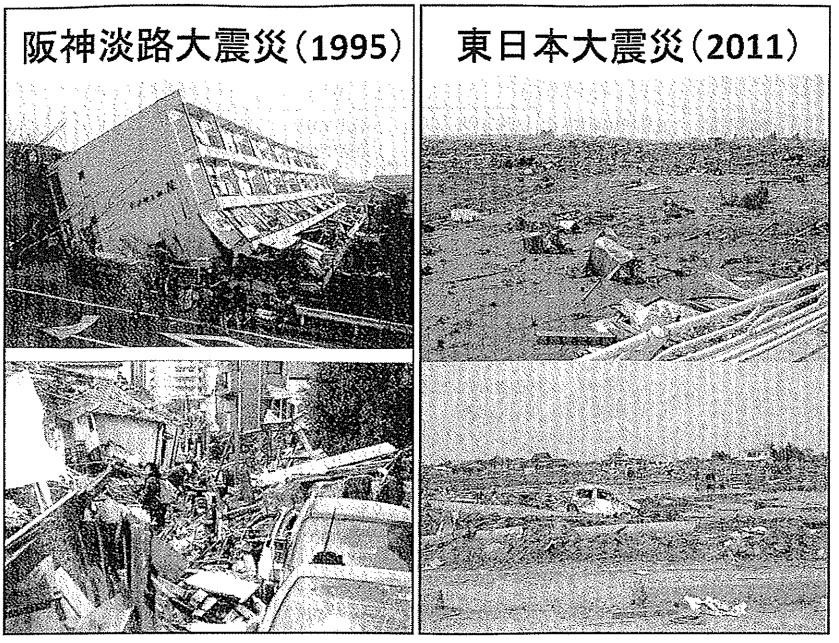

図1　阪神淡路大震災と今回の東日本大震災との比較
阪神淡路大震災の写真は毎日新聞社サイトより引用（毎日jp：http://mainichi.jp/select/jiken/graph/hansindaisinsai/）.
東日本大震災の写真は筆者提供.

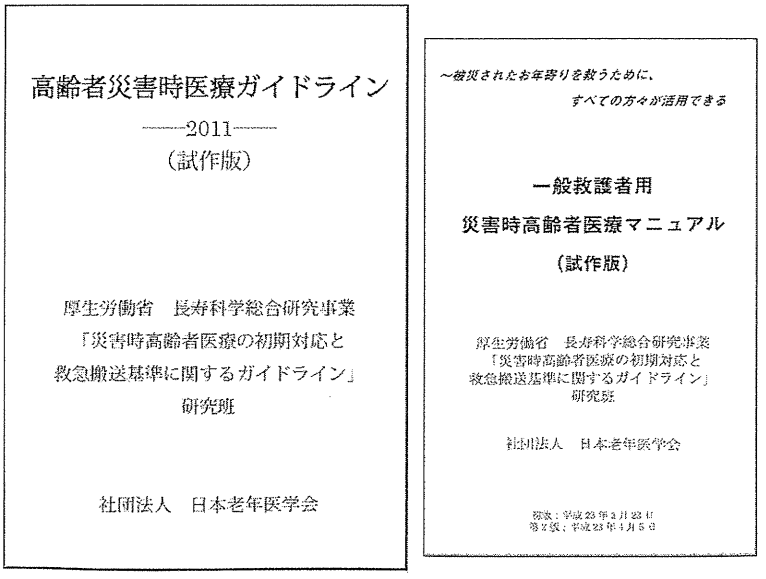

図2　高齢者災害時医療ガイドラインによる震災関連死の予防

に，このマニュアルはiPad/iPhone・スマートフォンにてダウンロード可能となり，電子媒体でも被災地の現場で役立っている.

3）医療支援と後方支援

3月29日に本学会対策本部の2名の医師（下門顕太郎・飯島勝矢（筆者））により，福島県・相馬市の避難所（旧相馬女子高校・廃校舎）にて医療支援が行われた.後方医療支援として，被災地福島県から新潟県見附市（市立見附総合病院）を中心に被災高齢者を移送した.

4）視察・調査

本ガイドライン作成研究班メンバーの2名の医師（高橋孝と飯島勝矢（筆者））が4月に宮城県・東松島市およ

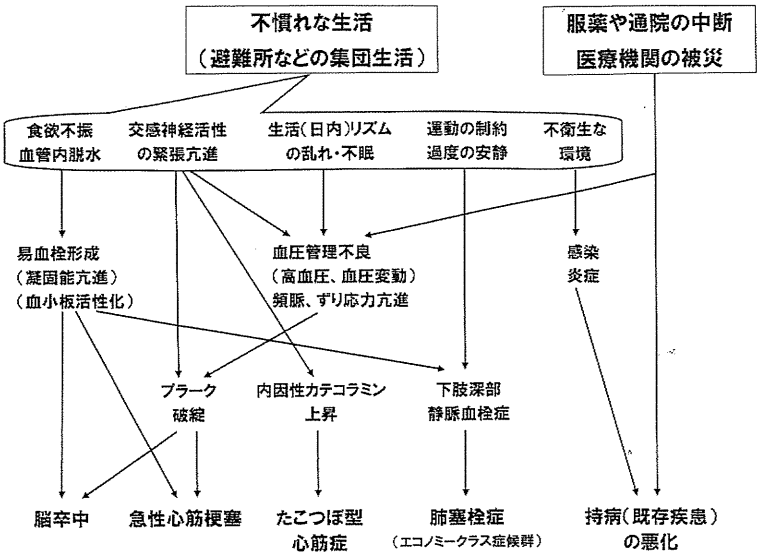

図3　震災後に起きやすい循環器系疾患の様々な発症機序：震災関連死への対策
医療機関の被災も含めて服薬や通院の中断も大きなトリガーになるが，避難所などの不慣れな集団生活に急に入らなければならないことによる精神的ストレスも非常に大きな契機になりやすい．

び石巻市に向けて出発した．東北大学・老年科の荒井啓行教授とともに現地を視察・調査し，「高齢者，特に要介護高齢者における被災後の能力喪失をいかに予防し，維持するか」を課題として今後の調査を継続する．

医療支援から改めて見えてきたこと

1）つなぐ医療の重要性：ポケット版『高齢者震災カルテ』の作成へ

今回，避難所での医療支援にあたり，日本老年医学会として簡易診療録を作成し，複写分を避難者ご本人に手渡した．なぜならば，特に震災直後の急性期における一避難所では，前に巡回してきた医療班の診療行為や注意点が記録に残されていないのが現実である．今回もその問題の重要性を改めて認識した．今回の経験を踏まえ，日本老年医学会およびガイドライン作成研究班としてポケット版診療録である『高齢者震災カルテ』を作成中である．震災前の医療情報に加え，各巡回医療班が処置・処方内容・申し送りなどの情報を伝達していくもので，被災現場での急性期医療に活用してほしい．

2）よりきめ細やかな配慮を

水は避難所の廊下には届いているが，高齢者の口元には届いていない．確実に口元まで届けるためには，「誰が担うべきなのか，誰が担うことで円滑さを生むのか」を現実的に考える必要があるであろう．他職種の協力も得て，より細部にまで配慮が行き届いたサポートを考えていきたい．

震災関連死：ゼロを目指して

震災関連死とは直接死（家屋倒壊や火災による死亡）以外で災害後に死亡することである[2)3)]．阪神淡路大震災では死者全体の約14%が避難生活中に死亡したことから，震災関連死がより注目され，多くは高齢者（9割が60歳以上）である．新潟県中越地震では死者は67名であったが，全体の76%が震災関連死とみられている．そこには，車内泊による静脈血栓塞栓症（VTE）・エコノミークラス症候群やタコツボ型心筋症も含まれている[4)]．図3に震災後に起きやすい循環器系疾患の発症機序を示す．医療機関の被災も含めて服薬や通院の中断も大きなトリガーになるが，避難所などの不慣れな集団生活に急に入らなければならないことによる精神的ストレスも非常に大きな契機になる．また，疲労やストレスによる免疫力低下や血圧上昇など，長引く避難生活は数多くの現象をもたらす[5)]．今回の震災においても震災関連死の報告は少なくない．年代別では65歳以上の高齢者が全体の90%であり，心筋梗塞など循環器系疾患と呼吸器系の疾患が全体の62%を占めている．

よく経験する実例として，避難所生活におけるプライバシー欠如，環境衛生の不良，疲労などに加えて，断水（水洗トイレの使用不可）や慣れない環境に対する躊躇もあり，トイレをあえて控えるために水分摂取量を控えてしまい，血管内脱水を背景とした脳心血管疾患の発症につながってしまう．よって，より具体的なきめの細か

い医療サポートを今後も考えていく必要がある．

震災関連死の予防を目指すに当たり，まずは血圧管理と血栓対策は必須であろう．特に心房細動や脳血管障害，急性冠症候群，静脈血栓塞栓症（VTE），エコノミークラス症候群などに対する配慮が必要になってくるからである．薬剤の紛失による中断，診療所や医療機関への通院継続の中断などの影響に加え，身体的および心理的要因も大きく関与する．脱水および低活動レベルが誘発されやすい避難所生活では，特に気を配ることが必要である．

慢性期管理の重要性

慢性期管理も非常に大きな課題を抱えている．避難所からやっと仮設住宅への入居が徐々に進む訳だが，しかし，そこには新たな問題が発生する可能性を秘めている．いわゆる「孤独・虚無感などの精神面のさらなる不安定化」，そして「高齢者の潜在的能力の喪失の可能性」である．

1）高齢者の仮設住宅入居におけるピットフォール：「仮設住宅シンドローム」

今後，仮設住宅への入居が進むにあたり，新たな問題点も出てくる．被災高齢者は現実に戻りやすくなり，悲嘆，絶望，罪責（自分だけが生き残ったこと，家族を救ってあげられなかったこと（サバイバーズ・ギルト），などへの反省）の感情と向き合うこととなる．また，周囲への意識が薄れ，無刺激な生活になりがちである．仮設住宅での一人暮らしへの不安とともに，避難所にいた方が食事面などむしろ楽であると感じてしまうケースもあり，自立支援の難しさも覗える．これらは『仮設住宅シンドローム』と言っても過言ではない．慢性期にむけて廃用（生活不活発病）予防のために，長期的に地道な自立支援が急務である．また，まだこの時期は一方的な指導よりも，むしろ『共感』してあげる周囲の配慮が必要であろう．

2）避難所医療に加え，災害時『在宅医療』の原点を改めて見直す

避難所での医療だけでなく，「在宅高齢者」もいかに守るかが重要であろう．実際，在宅高齢者が家に閉じこもり気味になり，自宅でも脱水傾向に陥り，また寝たきりから褥瘡へと向かうという現実がある．今回の大震災のもう一つの特徴として，被災地の数多くの中核病院や医療介護施設も同時に被災してしまったことである．改めて『災害時在宅医療』の原点に立ち返り，慢性期だからこそ「地域に根付いた医療」こそが患者の管理だけでなく，その家族の安心にまでつながる．

要介護高齢者避難誘導システムの確立・啓発・普及

今回の大震災においても要介護高齢者の対応が大きな問題となっている．避難所，福祉避難所，特別養護老人ホームも含めた施設入所，訪問在宅医療，医療機関（大学・病院・診療所），そして被災地外の後方支援などとの連携が今まで以上に必要とされ，今後，災害時にはどの高齢者がどの選択肢（施設）に円滑に運ばれるのかをあらかじめ検討しておきたい．長期的な円滑さを求めて，「系列を超えた横の広域医療連携」が必須である．

さいごに

今回，わが日本では史上最大の大震災が発生し，高齢者災害時医療を改めて原点から見つめ直さなければならない．高齢者にとってまだ先の見えない過酷な環境が続くことが予想され，行政・そして様々な医療機関や組織・団体と幅広い広域連携を可及的速やかに構築する必要があり，本学会がその一端を担う役目がある．

参考文献

1) Morimoto S, Iijima K, Kuzuya M, Hattori H, Yokono K, Takahashi T: Guidelines of Non-Medical Care Providers to Find Illnesses in Elderly Evacuees After the 2011 off the Pacific Coast of Tohoku Earthquake. Journal of the American Geriatrics Society 2011; (in press).
2) Leor J, Poole WK, Kloner AR: Sudden cardiac death triggered by an earthquake. N Engl J Med 1996; 334: 413–419.
3) Katsouyanni K, Kogevinas M, Trichopoulos D: Earthquake-related stress and cardiac mortality. Int J Epidemiol 1986; 15: 326–330.
4) Watanabe H, Kodama M, Okura Y, Aizawa Y, Tanabe N, Chinushi M, et al.: Impact of earthquakes on Takotsubo cardiomyopathy. JAMA 2005; 294: 305–307.
5) Kario K, Matsuo T, Kobayashi H, Yamamoto K, Shimada K: Earthquake-induced potentiation of acute risk factors in hypertensive elderly patients: possible triggers of cardiovascular events after a major earthquake. J Am Coll Cardiol 1997; 29: 926–933.