

## LETTER

doi:10.1017/S1041610213002305

**Behavioral improvement of dementia residents in a group home with an increased number of residents after the Great East Japan Earthquake 2011**

The Great East Japan Earthquake 2011 occurred on March 11 (Meguro, 2011). Group homes (GH)-A and B, run by a private company, were located in the coastal area of Kesen-numa city and damaged by the disaster. Fourteen of the 17 elderly residents living prior to the disaster in GH-A and B were evacuated to another GH-C run by the same company. The number of residents prior to the disaster in GH-C was nine, but almost tripled to 23 after the disaster, and several residents started to live together in one room. Compatibility of residents living in the same room was examined. Worsening of behavioral abnormalities caused by overcrowding was anticipated, but surprisingly behavior was improved (see Supplementary Table S1, available as supplementary material attached to the electronic version of this paper at [www.journals.cambridge.org/jid\\_IPG](http://www.journals.cambridge.org/jid_IPG)).

Twenty-three residents (mean age, 81.7 years) were studied for the diagnosis of dementing diseases, Mini-Mental State Examination (MMSE), memories of the disaster, and the changes in the amount of care in daily life. They were all diagnosed with dementia according to DSM-IV. Dementing diseases were diagnosed by the NINCDS-ADRDA (McKhann *et al.*, 1984) for Alzheimer's disease (AD), NINDS-AIREN (Roman *et al.*, 1993) for vascular dementia (VaD), and both for mixed dementia (MxD), supported by the ischemic score (Hachinski *et al.*, 1975). The severity of dementia was determined using the MMSE score:  $\geq 20$ , mild; 10–19, moderate; and  $\leq 9$ , severe. There were 14 AD, six MxD, and three VaD patients, comprising three mild, nine moderate, and 11 severe dementia patients. Memories of the disaster, including the earthquake, subsequent tsunami, and the evacuation, were obtained in interviews. Two observers independently evaluated the changes in the amount of care in daily life required by the patients while eating, participating in recreation events, bathing, etc., and relationships with other residents in terms of consideration of others' feelings etc. The observers were from the managing staff of the company who knew all the residents at least for the past six months. The pre- and

post-disaster assessments were performed one week prior to and one month after the disaster. The residents' behaviors were routinely assessed in the first week of the month for one month. The disaster occurred on March 11, 2011; it was one week after the assessment was done in the first week of March. Behaviors were defined as "improved" if both evaluators indicated the finding as "unchanged," and the evaluations were inconsistent and "aggravated" if both indicated this according to direct observation. There were no changes in drug administration during this period.

Memories of the earthquake were retained by all the residents with mild and moderate dementia. Among the residents with severe dementia, less than 50% retained the memory. Of the 23 residents, behavior "improved" in 12, remained "unchanged" in eight, and "aggravated" in three patients. The ratio of residents with "improved," "unchanged," and "aggravated" behavior were the same in residents with moderate dementia (3:3:3), but eight of the 11 residents with severe dementia showed "improved" behavior. Dementing diseases, severity, and behavioral changes in residents in each room (rooms 1 to 10) are shown in Table S1. The cases with "improved" behavior included "a mild VaD resident who became more careful about TV volume in the dining room" (room 1), "a severe VaD resident who began to eat more food," and "a moderate AD resident who started to help with cleaning up after eating" (both in room 2). Some behaviors also "improved" in severe dementia residents, but no clear relationship with dementing disease was found.

Living in a small group and dining in a large group might have reminded the residents of their family and school life. Residents with severe dementia seem to have been particularly able to adjust to the new environment, probably due to the stimulation of their remote memories. Actually, most improved residents (11/13) had lived in households with three generations prior to their admission to the group home, and also went to school; however, two of the three residents with aggravated behavior were the oldest sisters from large families, and the caring for their younger brothers prevented them from going to school.

All the residents with mild to moderate dementia, but only half of the residents with severe dementia retained the memory of the earthquake. Emotional memory was related to the amygdala (Schultz *et al.*, 2009), and less retained emotional memory was associated with the more atrophied amygdala.

Some residents with severe dementia who talked about the disaster showed relatively spared about the amygdala according to CT or MRI (data not shown). Also, careful consideration of the compatibility of the residents in the same room through trial and error produced good effects on behavior. Our findings suggest that care for residents in a small group might have good effect on older residents with dementia.

### Acknowledgment

We would like to offer our sincerest prayers for the repose of the souls who lost their lives, and to express our deepest sympathy for people who have suffered from this disaster.

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KENICHI MEGURO,<sup>1</sup> KYOKO AKANUMA,<sup>1</sup>  
KEIKO TORAIWA,<sup>2</sup> MIMA OKUBO<sup>2</sup>  
AND KIYOEI ONODERA<sup>3</sup>

<sup>1</sup>Department of Geriatric Behavioral Neurology,  
Tohoku University Graduate School of Medicine,  
Sendai, Japan

<sup>2</sup>Group Home Poran Kesen-numa, Kesen-numa, Japan

<sup>3</sup>Institute for Handicapped, Tadakoshi-So,  
Kesen-numa, Japan  
Email: k-meg@uminac.jp