improve to baseline, and he was ultimately discharged 6 weeks after admission.

All procedures performed were carried out in accordance with national law and the Helsinki Declaration of 1964 (in its present revised form). Informed consent was obtained from the patient.

To the best of our knowledge, this is the first documented report of a patient with MSA infected by SARS-CoV-2. Initially, abrupt worsening of his neurological symptoms with COVID-19 were concerning, as a recent report suggested that COVID-19 in patients with PD might result in poor prognosis, such as rapid clinical decline leading to sudden death.[3] A report of a patient with PD with only mild COVID-19 related abnormalities on chest computed tomography was found to result in a fatal course. However, we found the present patient with MSA to experience only mild respiratory symptoms, and undergo only transient worsening and return to baseline neurologically. Therefore, based on the present case, we presume that COVID-19 itself does not appear to lead to long-lasting worsening motor symptoms in MSA. Furthermore, the present case suggests that the prognosis of parkinsonian patients infected with COVID-19 might vary. It remains unclear whether such a difference of clinical outcomes in PD and MSA is due to primary brain pathology or secondary pathology as a result of COVID-19 infection. Therefore, more reports are required to address this issue.

The current case suggests that clinicians should consider the possibility of SARS-CoV-2 infection when patients with parkinsonism present with acute worsening of their motor symptoms. To date, little is known about the precise mechanism of how COVID-19 could induce such worsening. One possibility is that infection could accelerate the pathology of alpha-synucleinopathies.[4] However, the present patient only showed transient worsening of neurological symptoms, giving rise to the possibility of factors such as psychological stress or reduced physical activity as a cause.[5] The present case might provide clinicians with an initial glimpse into the association between COVID-19 and multiple system atrophy. Future observations regarding worsening of neurological symptoms and signs in PD and MSA are required in this era of COVID-19 pandemic.

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Disclosure statement

The authors declare no conflict of interest.

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RESEARCH STUDIES

Preparedness guide for people with dementia and caregivers in COVID-19 pandemic

Dear Editor,

With the global pandemic of the novel coronavirus disease 2019 (COVID-19), people with dementia (PWD) are reported to have higher morbidity and mortality than those without dementia.[1–3] The government of Japan has called on its citizens to implement measures to restrict the spread of COVID-19, such as refraining from going out and avoiding the "Three Cs," namely, "Closed spaces with poor ventilation," "Crowded places with many people nearby" and "Close-contact settings." However, there are many issues regarding COVID-19 restrictions on PWD.

First, PWD may have difficulty understanding and following infection control measures because of their cognitive impairment and behavioral and psychological symptoms of dementia (BPSD).[4,5] Second, COVID-19 infection may present with atypical signs and symptoms in older people, which may reduce the chances of early detection and treatment. It is particularly problematic for older PWD because they may not be able to complain about their symptoms clearly. Third, restriction measures for COVID-19 may have adverse effects on the PWD. They need support from caregivers and long-term care insurance services to meet their daily needs and maintain their daily routines, including

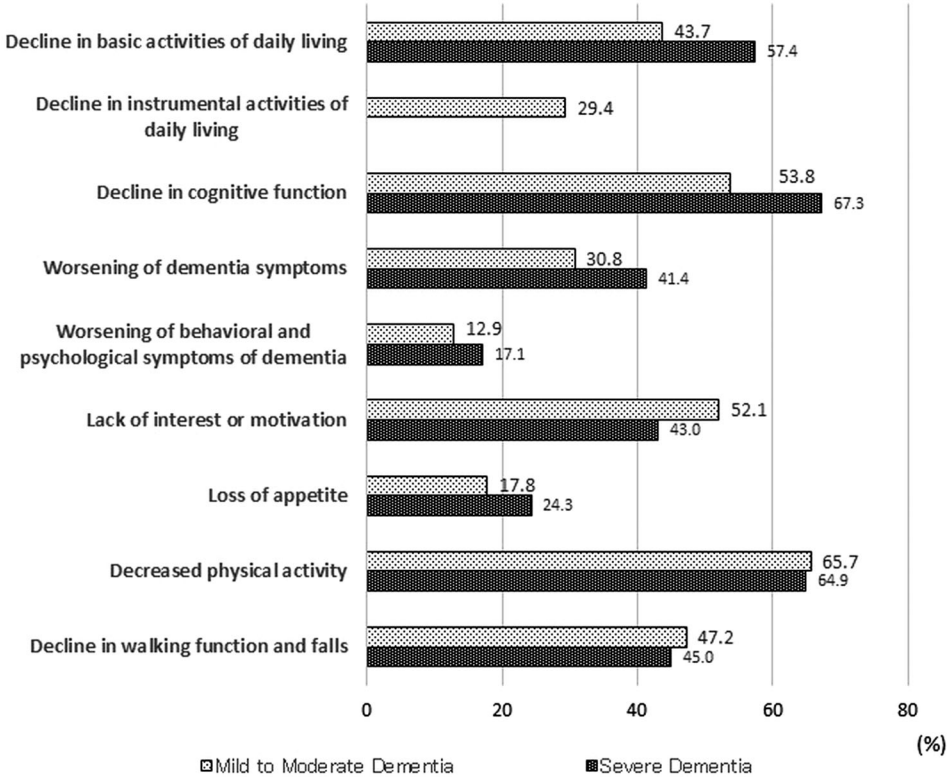

Figure 1 The impact of COVID-19 on people with dementia. A questionnaire survey of the care managers was conducted. Care managers are the key professionals in Japan's long-term care insurance system, who develop care plans and coordinate services provided to those who need care. The severity of dementia was classified as follows based on "Criteria for determination of the daily life independence level of the elderly with dementia "defined by Ministry of Health, Labour and Welfare (Japan). There are five levels in the original levels (Grades I–IV, M). Mild to moderate dementia (the original level Grade II); Symptoms, behavior or difficulty in communication that interfere the person's daily life are observed to some degree, but can live independently if someone will look after. Severe dementia (Grade III or higher); Symptoms, behavior or difficulty in communication that interfere with the person's daily life are observed once in a while or frequently, and requires care.

exercise and social interaction. Therefore, shutting down or reducing these services to control the spread of infection, combined with social distancing, may deprive them of cognitive and physical stimulation, leading to modulation of their circadian rhythms and worsening BPSD.[6,7] The online self-administered questionnaire survey of care managers conducted in June and July 2020 by Hiroshima University and the Japan Geriatrics Society corroborated the unfavorable effects of restriction measures (Fig. 1).[8] Of the 751 care managers who cooperated in the survey, 286 (38.1%) answered that home- and nursing facility-dwelling PWD they cared for had been negatively affected by COVID-19 restriction measures. The decline in cognitive and physical function and the onset or worsening of BPSD were most commonly observed as adverse effects. This survey also demonstrated that in the cases of shutting down or reducing long-term care insurance services, 72.6% of care managers answered that caregivers (families) took care of PWD temporarily instead of the home care services. It should be noted that this led to a significant increase in caregiver burden. The most common consequence reported was taking time off from work (40.1%), followed by depressive tendency (27.5%), physical burden (21.7%) and financial burden (11.4%).

Thus, the COVID-19 restriction measures have severe mental, physical and social impacts for PWD and their caregivers and need to be addressed.

The provision of appropriate and individualized information about precautions and preparedness for the spread of infection is urgently needed. It can lead to proper self-care and reduce the fear and anxiety of caregivers.[9] It might even contribute to the stabilization of the physical and mental states of PWD.

Based on the survey mentioned above, a preparedness guide for PWD and caregivers was developed by Hiroshima University, Alzheimer's Association Japan, Hiroshima Branch, and the COVID-19 response team of the Japan Geriatrics Society.[10] The guide provides information on COVID-19 and action plans according to their cognitive and physical status based on the following three points:

1. Information on COVID-19 and measures of prevention of infection in people with various stages of dementia, e.g., infection control measures for persons who cannot wash their hands or wear masks.
2. How to prepare for the spread of COVID-19, e.g., preparing for the cessation or reduction of long-term care services.
3. Prevention of deterioration of cognitive and physical functions in PWD resulting from COVID-19 restriction measures, e.g., the importance of social interaction, social support and exercises, and how to incorporate these activities into their daily lives.

This guide is freely available on the Hiroshima University website (http://inclusivesociety.jp/project.html#01) and is hoped to help PWD properly implement COVID-19 restriction measures while avoiding their adverse effects and minimizing the burden on caregivers.

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Disclosure statement

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COMMENTS

In reference to preoperative serum biomarkers in the prediction of postoperative delirium following abdominal surgery

Keywords: abdominal surgery, biomarker, postoperative delirium, predictive model.

Dear Editor,

We read with great interest the recent article by Ida *et al*. about determining the preoperative serum biomarkers for the prediction of postoperative delirium (POD) after abdominal surgery, published in *Geriatrics & Gerontology International* in December 2020.[1] Using multivariate logistic regression analyses, they developed a model for the prediction of POD with preoperative and intraoperative data, which included age, duration of surgery and platelet-to-lymphocyte ratio, with a largest area under the curve of 0.77. Their findings have potential implications, but there are several methodological issues in their article on which we wish to invite the authors to comment.

First, in the statistical analyses, the authors reported that the univariate analysis was carried out using Fisher's exact test or the Mann–Whitney *U*-test. The explanatory variables having $P \leq 0.1$