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COVID-19 infection and mortality risk for people with dementia in Brunei Darussalam

Abstract

Background: The COVID-19 pandemic remains a huge health crisis impacting millions of people globally. Vulnerable groups at higher risk of developing complications, morbidity and mortality from coronavirus disease 2019 (COVID-19) infections include older people and people with dementia.

Patients and methods: This was a retrospective review of the electronic health records of patients with COVID-19 infections admitted under geriatric medicine from 1 January 2022 to 31 March 2022. Demographic information, vaccination status, comorbidities, incident delirium and whether there was a diagnosis of dementia were obtained.

Results: There were 50 patients with a median age of 81.5 years. Approximately two-thirds had dementia. The inpatient mortality rate among people with dementia was 44.0%, while all patients without dementia survived to discharge. The COVID-19 vaccination status was also associated with a reduced disease severity on presentation, as well as survival to discharge.

Conclusions: Among the patients admitted to geriatric medicine with COVID-19 infections, all patients without dementia survived, while patients with dementia had a 44% inpatient mortality rate. People with dementia are at significant risk of mortality from COVID-19 infections.

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Keywords: COVID-19, dementia, elderly, mortality

Introduction

Dementia is a progressive neurodegenerative condition affecting cognitive function, memory and social abilities, which is severe enough to interfere with activities of daily living. The prevalence of dementia is increasing, particularly in the Asia-Pacific region. Dementia is associated with poor long-term health

outcomes, such as hospitalisation and dependence [1]. Brunei Darussalam is a Sultanate on Borneo Island, with a total population of 440,715 people. It has a rapidly ageing population. As of 2021, there were 27,894 older people aged 65 years and older, making up 6.3% of the population [2].

The coronavirus disease 2019 (COVID-19) pandemic has impacted millions of people and caused

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a strain on many healthcare systems globally. Older people are vulnerable to complications from COVID-19 infections and contribute to almost 80% of hospitalisations and a 23-fold greater risk of death compared to people below the age of 65 years [3]. Dementia is also an independent risk factor for mortality among older people [4]. At that time, the predominant strain of COVID-19 was the Omicron variant which supposedly caused mild infections with a lower rate of mortality. However, there was an observed possible higher rate of mortality in older people admitted with COVID-19 infections at that time [5]. In this study, older patients with COVID-19 infections were admitted to the main tertiary hospital in Brunei and their outcomes were evaluated. As there are no residential care facilities in Brunei, all older people were admitted to hospital from home.

Patients and methods

This was a retrospective review of the national electronic health records, or the Brunei Health Information Management System (Bru-HIMS) of all patients admitted with COVID-19 infections under Geriatric Medicine between 1st January 2022 to 31st March 2022 in RIPAS Hospital, Brunei Darussalam. Data on patient demography, functional status, vaccination status, co-morbidities, history of cognitive impairment or dementia, and incident delirium identified during hospitalisation were collected. The severity of symptoms on admission was categorised as follows: Category 1 with no symptoms; Category 2 with mild symptoms such as fever, sore throat, cough, loss of smell or taste and diarrhoea; Category 3 with clinical or radiological signs for pneumonia but not requiring oxygen; and Category 4 with a requirement for oxygen support due to pneumonia [6]. COVID-19-specific treatment administered for patients admitted with COVID-19 infections included remdesivir for patients at high risk for mortality and dexamethasone for those who are Category 4 severity or require oxygen. Risk factors for mortality which warranted consideration of remdesivir included age 60 years and older (all Geriatric Medicine patients) and comorbidities, such as cardiovascular disease, dementia, pulmonary disease and diabetes mellitus. Clinical outcomes such as length of stay and mortality were obtained. Data was entered into an Excel spreadsheet and analysed.

Results

There were 50 patients with COVID-19 infections admitted under geriatric medicine from January to March 2022. There were 29 (58%) females and

21 (41%) males. The median age was 81.5 years (range 64 to 97 years). The most common comorbidities were dementia 34 (68%), followed by diabetes 21 (42%), strokes 18 (36%) and cardiac disease 18 (36%). There were 27 (54%) who were fully dependent on activities of daily living. There were 23 (46%) who were mobilising independently, while half 24 (48%) were immobile or wheelchair transfer. In terms of COVID-19 vaccination status, there were 13 (26%) who were unvaccinated, 8 (16%) had one dose, 22 (44%) had two doses, and 7 (14%) had three doses.

Half of the patients had delirium during the admission. Median length of stay was 8.5 days (range 2 to 20 days). Among the 34 (68%) of patients with dementia, 15 (44%) passed away in hospital. All patients with COVID-19 infections without dementia were alive on discharge. Table 1 summarises the mortality rates based on comorbidities including history of cognitive impairment, severity of symptoms, level of dependence, COVID-19 vaccine dose and COVID-19-related treatment received.

Discussion

This was a retrospective review of older patients admitted under geriatric medicine with COVID-19 infections between January and March 2022 in RIPAS Hospital, Brunei Darussalam. During that time, the third wave of COVID-19 was predominantly caused by the Omicron variant. While this strain was more transmissible, there were supposedly fewer admissions, less severe illness and a lower-case fatality rate compared to previous variants, such as alpha and delta variants [5]. This variant predominantly targeted upper airways, with common presenting complaints of nasal discharge, sore throat and laryngitis. For dependent patients, it was observed that there was difficulty expectorating secretions, which may cause oxygen desaturation in patients [7]. Thus, during the third wave, assistance with sputum clearance using mucolytics and chest physiotherapy was emphasised, as upper airway obstruction was believed to contribute to patient deterioration [8].

The patients admitted with COVID-19 infections had a significant number of comorbidities, including dementia, diabetes and cerebrovascular and cardiovascular disease. There was also a high rate of dependence. This level of multimorbidity and functional disability was similar to a previous study on Geriatric Medicine inpatients from RIPAS Hospital prior to the pandemic [9]. However, the pandemic has caused an increase in complications, such as delirium and pressure injuries, that may contribute to mortality [10, 11].

Table 1. Mortality rate based on comorbidities including history of cognitive impairment, severity of symptoms, level of dependence, COVID-19 vaccine dose and COVID-19-related treatment received

| Variable | | No. of patients | Mortality, n [%] |
|----------------------------|--------------|-----------------|------------------|
| Known cognitive impairment | Yes | 34 | 15 (44%) |
| | No | 16 | 0 (0%) |
| Cardiovascular disease | Yes | 18 | 3 (16.7%) |
| | No | 32 | 12 (37.5%) |
| Pulmonary disease | Yes | 6 | 2 (33.3%) |
| | No | 44 | 13 (29.5%) |
| Stroke | Yes | 18 | 7 (38.9%) |
| | No | 32 | 8 (25.0%) |
| Diabetes | Yes | 21 | 5 (23.8%) |
| | No | 29 | 10 (34.5%) |
| Severity of symptoms | Category 2 | 26 | 4 (15.4%) |
| | Category 3 | 6 | 0 |
| | Category 4 | 18 | 11 (61.1%) |
| Level of dependence | Dependent | 27 | 11 (40.7%) |
| | Independent | 23 | 4 (17.3%) |
| COVID-19 vaccine dose | Unvaccinated | 13 | 6 (46.1%) |
| | 1 dose | 8 | 5 (62.5%) |
| | 2 doses | 22 | 4 (18.2%) |
| | 3 doses | 7 | 0 (0%) |
| Remdesivir given | Yes | 17 | 5 (29.4%) |
| | No | 33 | 10 (30.3%) |
| Dexamethasone given | Yes | 21 | 11 (52.3%) |
| | No | 29 | 4 (13.8%) |

Brunei launched its National Vaccination Programme in April 2021, with the first phase targeting vulnerable patient groups, such as older people and those with comorbidities. At the time of the study, a minimum of two doses were required to be considered fully vaccinated, with vulnerable patients encouraged to have a third dose or booster. There were four available vaccines at the time of this study: Pfizer, Moderna, Sinopharm and AstraZeneca [5]. COVID-19 vaccination doses particularly two and three doses were shown to be associated with a reduced mortality rate. This supports the use of vaccines in protecting vulnerable population groups against complications from COVID-19 infections [12].

In this study, the mortality rate was high (44%) among patients diagnosed with dementia. This was consistent with another observational study from an Italian hospital, which found a mortality rate of 62.2% among people with dementia [13]. Therefore, when patients with dementia should be encouraged and prioritised to get immunised, preferably with

a booster dose. Advanced care plans should also be introduced, discussed and documented for people with dementia, which is a useful document especially when admitted with COVID-19 infections [14].

Limitations to the study include the small sample size and outcomes related specifically to the Omicron variant of COVID-19 at the time of the study. The documented cause of death and whether it was attributed specifically to COVID-19 infections or otherwise were not confirmed. Further studies may be required in other localities and with different COVID-19 variants to evaluate outcomes for older people and people with dementia.

Conclusions

Among the patients admitted to geriatric medicine with COVID-19 infections, all patients without dementia survived, while patients with dementia had a 44% inpatient mortality rate. People with dementia are at significant risk of mortality from COVID-19 infections.

Article information and declarations

Acknowledgements

None.

Data availability statement

The data that support the findings of this study are available from the corresponding author, (SPT), upon reasonable request.

Ethics statement

The study was performed in accordance with the principles of the Declaration of Helsinki.

Author contributions

Both authors were involved in planning, data collection, analysis, drafting and finalising the manuscript.

Conflict of interest

Both authors have no conflict of interest to declare.

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Supplementary material

None.

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