The Number of Coronavirus Disease 2019 Vaccine Doses and Severe Clinical Outcomes in Older Patients Infected With a Severe Acute Respiratory Syndrome Coronavirus 2 Omicron Variant

TO THE EDITOR—Mwimanzi et al recently reported that the third dose of a coronavirus disease 2019 (COVID-19) vaccine boosted Omicron-specific neutralization in older individuals, and they noted that the number of chronic health conditions was the strongest factor of weaker humoral responses, indicating the immune benefits of a third vaccine dose [1]. Older adults and individuals with comorbidities are at increased risk of lethal COVID-19 disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection [2, 3]. SARS-CoV-2 Omicron variants, the transmission of which is greater than that of previous variants, have appeared with several mutations, especially in the spike protein; some of the mutations are important for immune escape, and Omicron variants have thus spread rapidly and become an important, worldwide problem [4].

It is, therefore, important to determine whether a third vaccine dose affects disease severity among COVID-19 patients infected with an Omicron variant. We investigated the clinical features of 23 patients whose COVID-19 became severe and who were admitted to the intensive care unit at Hyogo Prefectural Kakogawa Medical Center (Kakogawa, Hyogo, Japan) after they were infected with the Omicron BA.1 or BA.2 variant during the 3-month period of January–March 2022 (Table 1).

The patients’ median age was 68 years (interquartile range [IQR], 65–74 years). Nineteen (83%) were male. Twenty-one (91%) of the patients required mechanical ventilation, and the other 2 (9%) required high-flow oxygen therapy. The median number of days from symptom onset to hospitalization was 8 days. Twelve patients (52%) survived, with a median of 27 days from onset to their discharge, and the other 11 (48%) died (median, 27 days from onset to death). The median age of the patients who died was 72 years (IQR, 69–78 years), which was higher than that of the patients who survived (65 years [IQR, 59–68 years]).

Table 1. Characteristics of Older Patients Admitted to an Intensive Care Unit for Coronavirus Disease 2019 Treatment Following Infection With an Omicron Variant of Severe Acute Respiratory Syndrome Coronavirus 2

| Characteristic                             | All Patients (N = 23) | Survived (n = 12) | Died (n = 11) |
|--------------------------------------------|-----------------------|-------------------|---------------|
| Age, y, median (IQR)                       | 68 (65–74)            | 65 (69–68)        | 72 (69–78)    |
| Male sex, No. (%)                          | 19 (83)               | 11 (92)           | 8 (73)        |
| BMI, kg/m², median (IQR)                   | 23.6 (21.5–25.4)      | 23.5 (20.8–28.4)  | 23.6 (23.1–24.8) |
| Days from onset to hospitalization, median (IQR) | 8 (3–10)             | 10 (6–11)         | 5 (3–8)       |
| Days from onset to discharge, median (IQR) | 27 (19–34)            | 27 (25–34)        | 27 (14–32)    |
| COVID-19 vaccination, No. (%)              |                       |                   |               |
| Not vaccinated                             | 13 (67)               | 9 (75)            | 4 (36)        |
| Two doses of vaccine                       | 10 (43)               | 3 (25)            | 7 (64)        |
| Three doses of vaccine                     | 0 (0)                 | 0 (0)             | 0 (0)         |
| Medical history, No. (%)                   |                       |                   |               |
| Diabetes                                  | 13 (57)               | 6 (50)            | 7 (64)        |
| Hypertension                              | 9 (39)                | 3 (25)            | 6 (55)        |
| Chronic heart disease                      | 6 (26)                | 1 (8)             | 5 (45)        |
| Cerebrovascular disease                    | 5 (22)                | 1 (8)             | 4 (36)        |
| Chronic kidney disease                     | 4 (17)                | 0 (0)             | 4 (36)        |
| Hyperlipidemia                             | 4 (17)                | 1 (8)             | 3 (27)        |
| Chronic lung disease                       | 2 (9)                 | 2 (17)            | 0 (0)         |
| Autoimmune disease                         | 2 (9)                 | 1 (8)             | 1 (9)         |
| Cancer                                    | 0 (0)                 | 0 (0)             | 0 (0)         |
| Laboratory data, median (IQR)              |                       |                   |               |
| WBC count, cells/μL                        | 6340 (4290–10025)     | 5360 (4205–7020)  | 7710 (5535–16075) |
| Lymphocyte count, cells/μL                 | 632 (409–875)         | 584 (430–746)     | 632 (384–968) |
| CRP, mg/dL                                 | 9.7 (6.8–18.6)        | 10.9 (3.8–15.8)   | 9.3 (7.9–24.0) |

Abbreviations: BMI, body mass index; COVID-19, coronavirus disease 2019; CRP, C-reactive protein; WBC, white blood cell.
Regarding comorbidities (Table 1), diabetes was the most common (57%) and hypertension, chronic heart disease, and cerebrovascular disease were also common. The mean number of comorbidities was nearly twice as high among the patients who died as that of the patients who survived, supporting the findings of Mwimanzi et al [1]. Only 10 of the present patients received a second vaccine dose, and 7 of them were among the 11 patients who died (with comorbidities). Interestingly, none of the total series of 23 patients had received a third vaccine dose.

These results support the concept that a SARS-CoV-2 infection with an Omicron variant might become more severe, particularly in the elderly or in individuals with many comorbidities who have not received a third vaccine dose. A third (at least) vaccine dose appears to be effective and may be important, regardless of an individual’s advanced age or comorbidities, to prevent severe clinical outcomes caused by the Omicron variants.

Notes

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