ORIGINAL ARTICLE

Corona Virus Disease 19 (COVID-19) Patient Profile in Klungkung

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ABSTRACT

Introduction: Despite the effective global mass vaccination programs, which included booster shots, the emergence of new SARS-CoV-2 strains threatens to undo the enormous success achieved thus far in stopping its spread. This study aimed to assess the demographics of COVID-19 patients from February to May 2021.
Methods: Data were collected using secondary data from the medical records of Klungkung Regional General Hospital, Klungkung, at the time range according to the study period. Statistical Package for the Social Sciences (SPSS) version 25.0 for Windows and Microsoft Excel 2016 were used for the statistical analysis. All quantitative data, such as age, length of stay, and neutrophil-to-lymphocyte ratio (NLR), were estimated using central location measures (mean range). Proportions were used to describe qualitative or category variables.
Results: The demographic description of COVID-19 patients at Klungkung Regional General Hospital, Klungkung, found an average age of 51.94 years old. More patients were found to be male (55.4%) and did not have comorbidities (55.3%). Fourteen patients (14.4%) were gravid, and 37 patients (17.8%) were treated in the Intensive Care Unit (ICU). A total of 61 patients (29.3%) had desaturase with an NLR (mean) of 6.97 (51% increase). The average length of stay was 10.16 days, with the result of 24 patients dying (11.5%).
Conclusion: Patients with COVID-19 were found to have milder symptoms with less use of the ICU, not all of them experienced decreased saturation, and the case fatality rate was 11.5%.

INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic was caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2).[1] SARS-CoV-2 first surfaced in late 2019 in Wuhan (Hubei, China), where it soon spread to 220 nations.[2] Due to the destructive effects of the pandemic on people worldwide, mitigating measures are required to keep the pandemic under control.[3,4]

Although significant developments in clinical research have improved the understanding of SARS-CoV-2, outbreaks of this virus linked to generating mutant versions continue to occur in numerous countries. SARS-CoV-2 is susceptible to genetic evolution, allowing it to adapt to its new human host. Several COVID-19 variants have been identified during the pandemic. However, only a small number have been classified by the World Health Organization (WHO) as variants of concern (VOC) due to their effects on global public health. Five variants of SARS-CoV-2 have been identified since the start of the pandemic, according to a WHO epidemiological update (Alpha, Beta, Gamma, Delta, Omicron).[5]

Despite the powerful global mass vaccination campaigns, including vaccine boosters, and the historically quick development of COVID-19 vaccines, the advent of this novel SARS-CoV-2 strain poses a threat to reverse the tremendous progress made thus far in containing its spread. Even so, some of the most recent COVID-19 variants alter the symptoms and severity of the condition. This study aimed to assess the demographics of COVID-19 patients found at Klungkung Regional General Hospital, Klungkung, from February to May 2021.

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METHODS

This study was conducted at Klungkung Regional General Hospital, Klungkung, from February to May 2021. All patients who tested positive for SARS-CoV-2 in throat and/or nasopharyngeal swabs using a real-time polymerase chain reaction (RT-PCR) test were included in this study. Children and pregnant women with COVID-19 were also included in this study to describe all patients infected using the total sampling method. The exclusion criteria in this study were incomplete medical record data and patients who died on arrival who tested positive for COVID-19. This study was approved by the Health Research Ethics Committee of Klungkung Regional General Hospital, Klungkung, with number 000.9.2/1365/RSUD.

Data were collected using secondary data from the medical records of Klungkung Regional General Hospital, Klungkung, for the time span of the study period. Demographic details, medical history including co-morbidities, gravida, length of stay, ward (Intensive Care Unit/ICU or regular room), and vital signs were recorded upon admission. This study also recorded and published neutrophil-to-lymphocyte ratio (NLR) data representing fundamental laboratory parameters. Patients with stable conditions were treated in isolation rooms regardless of their symptoms, but patients with serious illnesses were treated in the ICU. All patients were treated according to the standard operating procedures (SOP) at Klungkung Regional General Hospital, Klungkung.

Standard methods were used to acquire throat and/or nasopharynx specimens. The nasopharyngeal sample was subjected to a quick analysis, and if the results were favorable, the RT-PCR analysis was performed using the available kit. Patients were counted from the length of stay from the day the patient entered the treatment isolation room (common room or ICU) until the patient was declared cured or died. Patients need an ICU room if COVID-19 is of a severe degree and an isolation room if they have mild to moderate symptoms. Gravida was evaluated based on possession of a pregnancy control book when the patient tested positive and was proven by evaluating the patient's pregnancy. The vital sign parameters included in this study were desaturation, expressed by an oxygen saturation of less than 95% or no desaturation.

Statistical Package for the Social Sciences (SPSS) version 25.0 for Windows and Microsoft Excel 2016 were used for the statistical analysis. All quantitative data, such as age, length of stay, and NLR, were estimated using central location measures (mean range). Proportions were used to describe qualitative or category variables. Demographic distribution was reported in descriptive statistics.

RESULTS

A total of 208 patients were included in this study. The demographic distribution of patients is shown in Table 1.

Table 1. Demographic distribution of COVID-19 patients

Characteristics	Total (%) [n = 208]
Age (mean) [years old]	51.94
Gender	
Male	111 (53.4)
Female	97 (46.6)
Comorbidities	
Yes	93 (44.7)
No	115 (55.3)
Gravida (n* = 96)	
Yes	14 (14.6)
No	82 (85.4)
Ward	
ICU	37 (17.8)
Isolation room	171 (82.2)
Desaturate	
Yes	61 (29.3)
No	147 (70.7)
NLR (mean)	6.97
Normal and low	102 (49.0)
Increase (>3.13)	106 (51.0)
Length of stay (mean) [days]	10.16
Outcome	
Alive	184 (88.5)
Died	24 (11.5)

*Number of female patients aged >18 years old

Based on data obtained at Klungkung Regional General Hospital, Klungkung, it was found that the average age of COVID-19 patients was 51.94 years old, with an age range from 5 to 92 years old. The number of male COVID-19 patients at Klungkung Regional General Hospital, Klungkung, was higher (53.4%) than female patients (46.6%). Most of the patients had no previous medical history (55.3%) and 93 of them had a history of diseases such as hypertension, diabetes mellitus, asthma, stroke, and others. Fourteen out of 96 women affected by COVID-19 who needed treatment were pregnant patients and all pregnant patients (100%) were in mild to moderate degrees. Hence, ICU treatment was not needed.

Based on significant vital examinations, it was found that 61 patients experienced desaturation at first admission Based on the data, there was one patient who had a saturation of 64% (not shown in the table) who was declared dead less than 24 hours after admission to the ICU. A total of 37 patients (17.8%) required treatment in the ICU due to desaturation that did not improve with oxygen administration,

co-morbidities, or patients with impending respiratory failure (severe degree). Based on the results of NLR investigations, it was found that the average NLR was 6.97, with 106 patients (51%) experiencing an increase in NLR of more than 3.13.

Regarding the length of stay, COVID-19 patients who came to Klungkung Regional General Hospital, Klungkung, from February to May 2021, were found to have an average length of stay of 10.16 days. Patients with a range of length of stay were found to be less than 24 hours (as previously mentioned) and up to 38 days of treatment. In the final output, the COVID-19 mortality rate at Klungkung Regional General Hospital, Klungkung, was 11.5%.

DISCUSSION

This study found that most COVID-19 patients treated at Klungkung Regional General Hospital, Klungkung, had mild complaints, with only 29.3% of patients experiencing desaturation. All patients treated in the ICU had comorbidities and all patients who died had a history of treatment in the ICU. The average age of COVID-19 patients at Klungkung Regional General Hospital, Klungkung, was found to be 51.94 years old based on their demographic profile. The relationship between age and COVID-19 was explained by several previous studies regarding the effect of age on immune conditions. The lymphocyte count was much lower in this study and was particularly obvious in older persons. Particularly, all severely ill patients had lower levels of CD4+T lymphocytes, CD8+T lymphocytes, and natural killer T (NKT) lymphocytes, proving that COVID-19 damages lymphocytes in the immune system. In COVID-19 individuals, lymphocyte deficiencies or incompetence can accelerate the disease, and functional exhaustion of antiviral lymphocytes was seen in these patients. Depletion of CD4+T and CD8+T cells was also discovered by high-dimensional single-cell analysis. The primary immune cells that protect the body from viral infections are human T cells, crucial to the host's ability to eliminate viruses from the body when they cause acute respiratory illnesses. An essential component of lymphocytes, natural killer (NK) cells may help to activate and direct adaptive immune responses. They play a crucial role in innate immunity.[6–9]

In this study, it was found that only 44.7% of patients had a history of co-morbidities. The most common comorbidities found in patients at Klungkung Regional General Hospital, Klungkung, were a history of high blood pressure, diabetes mellitus, and heart disease. Older age and co-morbidities, particularly diabetes and arterial hypertension, are linked to more severe forms of COVID-19 and are, therefore, thought to be risk factors for severe symptoms.[10–12] Iroungou, *et al*. (2021) stated that patients with a history of previous illnesses have an immunosuppressant condition. Therefore, they are more easily infected with viruses. In relation to comorbidities, according to the study, although the differences were not statistically significant, people who died had a higher prevalence of diabetes and arterial hypertension than people who survived.[13]

The low incidence of severe COVID-19 was due to the effectiveness of the vaccination given to the people in Klungkung. This was mentioned in a previous study by Pálinkás and Sandor, who studied the COVID-19 vaccine and the severity of COVID-19 in Hungary.[14] In the study, observations adjusted for chronic disease, sociodemographic indicators, primary care service features, and the protective impact of immunizations revealed that survival was higher in any cohort of individuals who have received vaccinations. In reality, throughout the pandemic period under review, the AstraZeneca, Janssen, Moderna, Pfizer, Sinopharm, and Sputnik vaccines had efficacy rates against all causes of death of 59.2%, 75.4%, 57.3%, 48.7%, 53.0%, and 55.7%, respectively. This indicates that the vaccine administration resulted in the patient not experiencing more severe symptoms.[14]

Most patients with COVID-19 experienced an increase in the NLR with an average of 6.97. A previous study in India stated that several biomarkers need to be considered to discover patients' complications or worsening.[15] Strong indicators of serious disease include elevated white blood count, decreased lymphocyte/platelet count, high interleukin-6, and high serum ferritin levels. Similar results were seen in this study, showing severe COVID-19-related disease with high initial levels of C-reactive protein (CRP), ferritin, and lactate dehydrogenase (LDH), an NLR ratio of 3.5, acute hypoalbuminemia, and creatinine.[15]

Soni, *et al*. (2021) found the case fatality rate was 2.6%.[15] All three patients had diabetes mellitus, and two of them also had chronic renal disease and required regular hemodialysis. Before being taken to the hospital with COVID-19, they had missed many dialysis appointments.[15] As previously mentioned, co-morbidities and age factors result in higher complications and mortality in COVID-19 patients.[16,17] However, mortality in COVID-19 patients still seemed high in this study, reaching 11.5% or 24 patients out of 208 total patients. Based on the study, it was found that all patients who died had at least one comorbid disease, ranging from hypertension to a history of heart disease. This study suspected the possibility of death caused by complications or exacerbation due to comorbid causes, which iss also supported in previous studies.[18] In

addition, it was found that some patients did not perform routine control for their comorbid diseases, thereby increasing the risk of patient mortality. The existence of a drug supervisor for patients with comorbidities is needed to help with routine control to reduce the risk of patient mortality if exposed to COVID-19.[19,20]

Limitations in this study were data that were not collected for a full year. Hence, they do not describe the annual incidence of COVID-19 at Klungkung Regional General Hospital, Klungkung. This study used a wide age range, including children, adults, and the elderly. Therefore, it did not describe whether age was a factor in COVID-19 morbidity and mortality. Incomplete data collection, including the history of COVID-19 vaccination or the type of vaccine obtained, was a limitation in collecting data and reporting whether vaccines effectively prevent COVID-19 at Klungkung Regional General Hospital, Klungkung.

CONCLUSION

The description of the COVID-19 patient profile found an average age of 51.94 years old with the characteristics of mostly men and having comorbidities. Patients with COVID-19 were found to have milder symptoms with less use of the ICU, not all of them experienced decreased saturation, and the case fatality rate was 11.5%.

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Conflict of Interest

The authors declared there is no conflict of interest.

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Authors' Contributions

Conception, drafting, writing the tables and figures: NKAS. Reviewing and editing: EW. Analyzing and interpretating data: IWASP.

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