Clinical Features of COVID-19 Patients at Udayana University Hospital During First Three Months of the COVID-19 Pandemic

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ABSTRACT

COVID-19 exhibits a wide variety of symptoms, ranging from mild, moderate, severe, and critical respiratory dysfunctions up to death. Therefore, this study aimed to examine the demographic, clinical, and laboratory profile of COVID-19 patients admitted to Udayana University Hospital, Bali, during the first three months of the pandemic. Data were collected from the electronic medical records of 236 patients hospitalized from April to June 2020. The samples had a mean age of 40 years old, and they consisted of 58.50% male. Based on the records, the common clinical characteristics included fever (52.5%) and cough (47.5%), followed by less common traits, such as sore throat (18.2%), dyspnea (10.2%), flu (8.9%), and headache (3.8%). Laboratory results during admission showed an average lymphocyte count of $2.16 \pm 2.19 \times 10^9$ cells/L and a neutrophil-lymphocyte ratio of 3.02 ± 3.41. The majority of patients were private corporation employees (30.51%), followed by migrant workers (21.19%). Furthermore, a fatality rate of 1.69% was recorded in the study hospital. These results were expected to provide epidemiological knowledge of COVID-19 patients, which can help clinicians to anticipate possible outcomes during treatment.

INTRODUCTION

SARS-CoV-2 is a newly discovered zoonotic pathogen with various clinical symptoms ranging from the common cold to severe respiratory dysfunctions.[1] In December 2019, the first outbreak emerged in Wuhan, China,[2] but the origin of the virus is still unknown. Furthermore, the authorities found that all the 'initial' patients had contact with the Wuhan wet market. After this discovery, the government sealed off the market to prevent possible mass transmission in the region, specifically to people planning to shop in the area. The virus was then officially named SARS-CoV-2 a few months after its identification by Chinese healthcare authorities.

This virus has a high reproductive rate and is easily transmitted to other people. After a few months of its discovery, the World Health Organization (WHO) declared COVID-19 a Public Health Emergency of International Concern, and imperatively coordinated a global response to overcome the outbreak.[4] It later became a pandemic, as CDC stated that a pandemic refers to 'an epidemic spreading over several countries or continents, usually affecting a large number of people.[5] Based on an in-depth study, COVID-19 was reported to be spread through human-to-human transmission via droplets, aerosol, or fomite. A previous study revealed that the virus has a mean incubation period of 6.4 days with a basic reproduction number of 2.24–3.58.[6]

COVID-19 can induce critical conditions in elderly patients as well as those with systemic comorbidities. Although the disease is highly infectious and still yet to be fully comprehended, data from WHO-China Joint Mission showed that approximately 80% of cases were in the "mild to moderate" categories. These levels of severity are often not life-threatening and do not require hospitalization. However, patients can still spread the virus to others, indicating that self-quarantine is mandatory. This home-care isolation is an important strategy to effectively prevent outbreaks and lower the rate of infection among aged people and patients with comorbid. The strategy involves providing space and resources in hospitals to people showing severe symptoms, which require active supervision.[1] In cases where patients are advised to undergo home-care isolation, a close monitoring system and the readiness of emergency medical services need to be tested. Several studies showed that the majority of the cases had 'omittable' mild to moderate symptoms combined with a high reproduction number. This indicates that outbreak containment without strict social restrictions and extensive tracing is relatively impossible.

The first two COVID-19 cases in Indonesia were announced by the President on March 2, 2020, followed by the appearance of more positive patients, and this overwhelmed medical facilities. An effective decision regarding the management of the patients, specifically those in need of hospitalization, is crucial, considering the limited resources available.[2] Therefore, this empirical study aims to examine the epidemiology, clinical features, and management of all confirmed COVID-19 cases in Udayana University Hospital, Bali, Indonesia. The study hospital serves as a tertiary healthcare facility, which receives patients with the worst clinical severity within the area. Deep knowledge about these severe cases is expected to help clinicians in day-to-day practice in anticipating the worst possible outcomes during treatment.

MATERIAL AND METHOD

This study analyzed secondary data from electronic medical records of all 236 confirmed COVID-19 patients admitted to Udayana University Hospital, including deceased and discharged, by the end of June 2020. Furthermore, this report comprised the epidemiological, clinical, laboratory, and radiological characteristics, as well as the outcome of patients. It also comprised of the treatments given during admission and discharge, including antiviral therapy, antibiotics, anticoagulant, and ventilator support.

A descriptive analysis was carried out using SPSS Statistics 25 to present the final results of data collected during this study. All data were presented in numbers (percentage) or mean with standard deviation. Furthermore, ethical approval was obtained from the ethics committee of Udayana University with reference number 1010/UN1422VII14/LT/2020. Information about the subjects was kept highly confidential and only used in line with the ethical guidelines.

RESULTS

A total of 236 samples were included in the study over a year from April to June 2020. Patients were aged 18 – 75 years with a mean age of 40 years (SD ± 14.25). The results showed that males were more prevalent, and accounted for 58.5% of all patients admitted, as shown in Table 1. Furthermore, the majority of the samples in this study were Indonesian, accounting for 98.3% of the total population.

Udayana University Hospital was dedicated as a referral healthcare facility for isolating and treating COVID-19 patients. In the early three months of the pandemic, the hospital received patients from every regency in Bali with the majority coming from Denpasar (35.1%), followed by Badung (15.9%) and Bangli (11.9%). However, it is important to note that there were 50 international migrant workers, specifically from countries, such as America and Italy. They then spread to all regencies on the island, including Bangli (20%), Gianyar (14%), Buleleng (12%), Denpasar (12%), Karangasem (12%), Badung (10%), Klungkung (8%), Tabanan (6%), and Jembrana (4%), as shown in Figure 1.
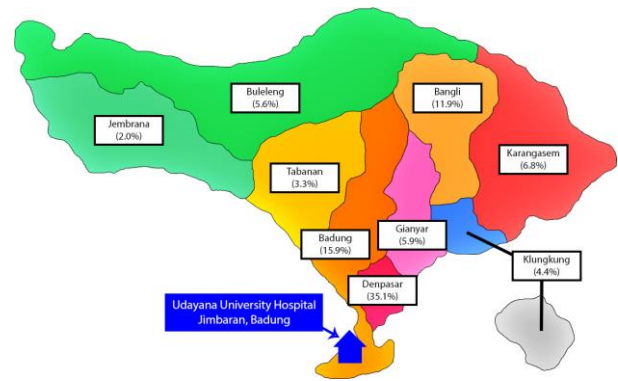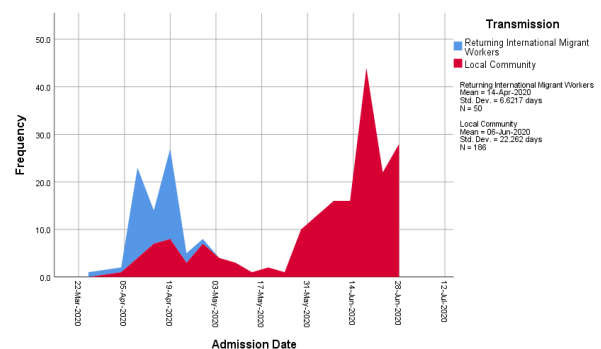

Source: Primary Data, 2022

Figure 1. District Origins of COVID-19 Patients Admitted to Udayana University Hospital Between April to June 2020

By the end of June 2020, a total of 232 patients had recovered, while 4 died. Various comorbidities contributed to the deaths of these 4 patients, including a 53-year-old female with Congestive Heart Failure (CHF); a 64-year-old male with severe comorbid pneumonia; a 62-year-old male with Coronary Artery Disease (CAD) and pneumonia; and a 59-year-old male with severe pneumonia and Type II Diabetes Mellitus, as shown in Table 2.

Table 3 shows the laboratory profile of patients admitted to Udayana University Hospital workers the first three months of the COVID-19 pandemic. Furthermore, all results were generally within the normal range.

Figure 2 shows the number of returning international migrant workers as well as the local community transmission between COVID-19 patients admitted to Udayana University Hospital during first three months of the COVID-19 pandemic.

Table 1. Demographic Profile of Patients

Characteristics	n = 236	%
Age Group (Years)		
18 – 20	4	1.70
21 – 40	125	53.00
41 – 60	80	33.90
> 60	27	11.40
Gender		
Male	138	58.50
Female	98	41.50
Occupation		
Private Employee	72	30.50
Migrant Worker	50	21.20
Healthcare Provider	23	9.70
Housewife	19	8.50
Public Worker	14	6.40
Traditional Market Seller	11	5.10
Student	9	3.80
Entrepreneur	8	3.40
Retired	7	3.00
State-Owned **Corporation** Employee	4	1.70
Driver	3	1.3
Others	13	5.5
History of International Travel 14 Days Prior to Admission		
Yes	57	24.2
No	179	75.8

Source: Primary Data, 2022

Source: Primary Data, 2022

Figure 2. Number of Returning International Migrant Workers and Local Community Transmission between Patients

Table 2. Clinical Profile of Patients

Characteristics	n = 236	%
Symptoms		
Fever	124	52.50
Cough	112	47.50
Chest tightness	24	10.20
Sore throat	43	18.20
Cold	21	8.90
Headache	9	3.80
Anosmia	9	3.80
Muscle ache	7	3.00
Diarrhea	1	0.40
Comorbidities		
Hypertension	22	9.30
Type 2 Diabetes Mellitus	19	8.10
Heart Problem	6	2.50
Malignancy	1	0.40
HIV	1	0.40
No Comorbidities	194	82.20
Therapy		
Vitamin C	236	100
Azithromycin	100	42.40
Chloroquine	58	24.60
Levofloxacin	41	17.40
Oseltamivir	35	14.80
Anti-Coagulant	17	7.20
Tocilizumab (anti IL-6)	7	3.00
Ritonavir/Litonavir	3	1.30
Plasma Convalescence	1	0.40
Hospitalization		
≤ 14 days	128	54.20
> 14 days	108	45.80
Discharge Condition		
Recover	232	98.30
Died	4	1.70

Source: Primary Data, 2022

Table 3. Laboratory Profile of Patients

Parameter	Value (Mean+SD)
Hb (g/dL)	13.93 ± 1.69
Hct (%)	42.44 ± 22.71
White Blood Cells (× 109 cells/L)	7.52 ± 2.64
Lymphocyte (× 109 cells/L)	2.16 ± 2.19
Neutrophil Lymphocyte Ratio	3.02 ± 3.41
Neutrophil (× 109 cells/L)	4.86 ± 4.59
Platelet (× 109 cells/L)	256.45 ± 90.77
AST (U/L)	36.14 ± 28.06
ALT (U/L)	39.22 ± 29.54
BUN (mmol/L)	11.88 ± 6.59
Serum Creatinin (mg/dL)	0.58 ± 0.14
Random Blood Sugar (mg/dL)	113.64 ± 37.62

Source: Primary Data, 2022

DISCUSSION

During the early stages of the pandemic, transmissions to and between medical workers spiked due to poorly imposed large-scale emergency biosecurity protocols within the medical environment and the community.[4] There was also a national lack of disposable Personal Protective Equipment (PPE), as well as advanced screening, diagnostical, and therapeu-tical medical equipment in regional hospitals due to a large patient influx to tertiary care hospitals around Bali. Furthermore, an ameliorated nationwide warning made by the ministry of health shaped the public perspective on the outbreak.[3]

After the first case, the Indonesian government implemented large-scale social restrictions by the end of March 2020.[7] It was believed that during this period, there were few local transmissions in Bali. This was because the majority of patients admitted were migrant workers returning from other countries, indicating that the transmission occurred while working overseas. The international viral spreading was the most critical factor, specifically in a situation where tracking and testing were limited. After the discovery of transmission through migrant workers, airports were closed to further prevent the spread of the virus by hindering the entrance of potential carriers from other regions.[8] However, by the end of May, travel restrictions were lifted, and this triggered a serious increase in the number of cases presented in June. Local transmissions were often seen at offices due to a change of setting to work-from-office, thereby forming new clusters.

The characteristics obtained in this study showed that travel and large-scale social restrictions influenced the number of cases. Close monitoring and large-scale restriction have been proven to lower the number of affected patients in the nation. The fluctuation of patients based on two major professions was presented in Figure 2. The graph showed that the first peak transmission of COVID-19 in April was mainly from returning migrant workers, and the second was from office employees, indicating local community transmission. During this period, COVID-19 had received a bad stigma from the population, and tracing had become an extensive project. This was because people were trying to hide their symptoms, thereby lying to healthcare and tracing workers. These factors made the contact tracing ineffective, and the testing of patients was not massive and extensive.

During the early phases of the COVID-19 pandemic, regional hospitals in all regencies were not ready and well-equipped to handle the

patients. Consequently, all COVID-19 cases were referred to Udayana University Hospital, which was dedicated by the government as a referral healthcare facility. The results showed that the majority of patients were from Denpasar, where they lived in highly-dense areas. A high number of cases were also recorded from Badung and Bangli.

This study revealed that most of the patients were admitted, tested, or seek proper medical treatment five to six days after the onset of symptoms. This factor was the constant elevation of cases, where pre-symptomatic could also spread the virus. An alternative argument proposed that this behavior was a form of denial from suspects, where they could not accept the possibility of being infected with COVID-19 due to the fear of shunning or isolation from social groups.[9,10] This poses an obstacle to effective tracing, hence, there is a need to educate the community and straighten the negative stigma directed at patients.

Although the number of cases was elevating during the study period, the results showed a very low fatality rate of 1.6%. This was because the majority of patients were in their productive years (non-elderly), as well as only had mild to moderate symptoms and fewer comorbidities.[6,11] Furthermore, the most common clinical features were cough and fever. All four fatal cases in this study showed severe symptoms as well as comorbidities, which required ventilator support. This finding is in line with a previous study that COVID-19 was only exceptionally deathly when the infection was severe, and patients with mild to moderate symptoms had a higher chance of recovery. Several studies revealed that infected people with comorbidities had a CFR of 1-3%.[12,13] A dangerous interaction between COVID-19 and systemic conditions, such as diabetes mellitus, hypertension, as well as cardiovascular and pulmonary diseases, was reported to increase the risk of disease progression, eventually leading to death.[14–16]

This study has several limitations, which are related to selection bias. Furthermore, a report from a single data gathering site did not provide complete knowledge and cannot be generalized to the whole community.

CONCLUSION AND RECOMMENDATION

In the first three months of the COVID-19 pandemic in Bali, most of patients treated in Udayana University Hospital were male and private employees aged 21-40 years old with no history of international travel 14 days before admission. Furthermore, the majority had symptoms, such as fever (52.50%) and cough (47.50%). The duration of hospitalization was almost evenly spread between ≤ 14 days (54.20%) and >14 days (45.80%) with a case fatality rate of 1.70%. Further studies are advised to involve more hospitals/data-gathering sites to minimize selection bias.

AUTHOR CONTRIBUTIONS

CAWP: conceptualization, supervision; KTPM: conceptualization, writing-review, and editing; IKAS: validation, project administration; IMSA: validation, writing-review, and editing; AAAYG: writing-original draft; NMDDS: investigation, data curation; HA: supervision, writing-review. CAWP = Cokorda Agung Wahyu Purnamasidhi; KTPM = Ketut Tuti Parwati Merati; IKAS = I Ketut Agus Somia; IMSA = I Made Susila Utama; AAAYG = Anak Agung Ayu Yuli Gayatri; NMDDS = Ni Made Dewi Dian Sukmawati; HA = Haruko Akatsu.

CONFLICTS OF INTEREST

The authors declared that there is no conflict of interest before, during, and after the writing of this paper. This study did not utilize any sort of personal funding or grants.

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