

ลักษณะทางคลินิกของผู้ป่วยโรคติดเชื้อไวรัสโคโรนา 2019 (COVID - 19)

ในโรงพยาบาลชิรพยาบาล ในมุมมองทางการพยาบาล

Clinical Characteristics of Coronavirus Disease 2019 (COVID-19) Patients in Vajira Hospital in Nursing Perspective

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บทคัดย่อ

ปลายปี พ.ศ. 2562 มีรายงานการพบผู้ป่วยอาการปอดบวมที่ไม่ทราบสาเหตุในเมืองอู่ฮั่น ประเทศสาธารณรัฐประชาชนจีน ต่อมาก็ได้มีการระบุสาเหตุของการติดเชื้อว่าเป็นไวรัส SARS-CoV-2 เรียกว่าโควิด-19 การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อศึกษาข้อมูลลักษณะทางคลินิกของผู้ป่วยโควิด-19 ในโรงพยาบาลชิรพยาบาลและติดตามข้อมูลของผู้ป่วยวิกฤติของโรคโควิด-19 เพื่อเป็นข้อมูลสำคัญทางการพยาบาล งานวิจัยเป็นการศึกษาข้อมูลหลังเชิงพร่องนาและเลือกกลุ่มตัวอย่างแบบเจาะจงที่เก็บข้อมูลในแบบบันทึกช่วงเดือนสิงหาคมถึงกันยายน พ.ศ. 2563 โดยอิงจากรายละเอียดลักษณะทางคลินิก ข้อมูลประชากร รังสีวิทยา และผลทางห้องปฏิบัติการ อีกทั้งยังติดตามข้อมูลการรักษาผู้ป่วยวิกฤติโควิด-19 ผู้ที่เข้ารับการรักษามีทั้งสิ้น 7 ราย มีค่ามัธยฐานของอายุ 35 ปี เป็นชาย 5 ราย หญิง 2 ราย มีข่ายสองรายที่มีอาการรุนแรงซึ่งหนึ่งในนั้นมีอาการขันวิกฤติ อาการของโรคประกอบด้วย การไอ เจ็บคอ มีไข้ หายใจลำบาก และน้ำมูกไหล ที่สำคัญผู้ป่วยที่มีอาการรุนแรงพบมีตัวบ่งชี้ทางชีวภาพงี่กับการอักเสบเฉียบพลันในร่างกาย เป็นที่น่าสังเกตว่าผู้ป่วยที่อยู่ในภาวะวิกฤตไม่ได้มีโรคร่วม ผลการศึกษาผู้ป่วยวิกฤติพบว่าลักษณะทางคลินิกประกอบด้วย ARDS, AGE, GIH, ลำไส้อักเสบ อาเจียนเป็นเลือดรวมถึงภาวะ MPC และ GGO ผลการติดตามพบว่าผู้ป่วยส่วนใหญ่มีอาการไม่รุนแรง ขณะที่ผู้ป่วยวิกฤติไม่ได้มีปัจจัยเสี่ยงที่สำคัญ ผลจากการศึกษานี้ช่วยให้เกิดความเข้าใจเกี่ยวกับลักษณะทางคลินิกของผู้ป่วยโรคโควิด-19 เกิดองค์ความรู้และการจัดการของพยาบาลในการรับมือสถานการณ์โควิด-19 ได้อย่างจำเพาะตามบริบทและชีวิตของประชาชนในสังคมเมือง

คำสำคัญ: ลักษณะทางคลินิก, ผู้ป่วยติดเชื้อ, โรคโควิด-19, มุมมองทางการพยาบาล

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Abstract

In late 2019, there was a report of a cluster of unfamiliar pneumonia cases emerged in Wuhan, China, which then identified SARS-CoV-2 as the causative agent of COVID-19. This study aimed to study the clinical characteristics of COVID-19 patients in the Vajira Hospital and follow the data of critical COVID-19 patient to be informative for nursing. The study design was a retrospective descriptive study and relied on purposive sampling that was collected in record form from August to September 2020. We described clinical, demographic, radiological, and laboratory findings as well as followed the medical history of a critical COVID-19 patient. The results showed that there were seven patients with a median age of 35, comprising five men and two women. Two male patients developed severe disease, and one progressed to critical COVID-19. The chief complaints included cough, sore throat, fever, shortness of breath, and rhinorrhea. Both severe patients exhibited biomarkers indicating acute inflammation in the body. Notably, the patient with no comorbidities developed critical symptoms. The result of critical COVID-19 found that clinical characteristics encompassed ARDS, AGE, GIH, colitis, coffee-ground emesis, as well as MPC, and GGO. The following result revealed that most COVID-19 patients in our study presented with mild illness, while critical COVID-19 symptoms did not exhibit any identifiable risk factors. These results contribute to understanding the clinical characteristics of COVID-19 patients, enhancing the knowledge and management of nurses for handling the COVID-19 situation specifically according to an urban context and lifestyle.

Keywords: Clinical characteristics, Infected patient, COVID-19, Nursing perspective

Introduction

In December 2019, an outbreak of pneumonia cases caused by an unidentified pathogen emerged in Wuhan, Hubei Province, China. The subsequent detection of the first case outside China occurred in Thailand. The responsible agent for this disease was identified as a severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The disease is referred to as coronavirus disease 2019 or COVID-19¹. As of May 24, 2021², the World Health Organization (WHO) reported that approximately 166 million people worldwide had been infected with SARS-CoV-2. This virus has demonstrated a higher rate of transmission compared to SARS-CoV and MERS-CoV. However, while SARS-CoV-2 spreads rapidly, only a small percentage of infected individuals have experienced severe symptoms, which can include pneumonia, pulmonary edema, and acute respiratory distress syndrome (ARDS)³. The clinical characteristics of

COVID-19 in the general population comprised fever, cough, dyspnea, malaise, fatigue, and sputum/secretion, while other common symptoms were neurological symptoms, dermatological characteristics, anorexia, myalgia, sneezing, sore throat, rhinitis, goosebumps, headache, chest pain, and diarrhea⁴. Severe illness is often prevalent among vulnerable groups, such as the elderly, obesity, and underlying health conditions. Furthermore, there were variations in hospitalization and mortality rates among different ethnic groups. Specifically, individuals of Black and South Asian descent demonstrated a higher possibility of requiring ICU admission⁵. Since the emergence of SARS-CoV-2, the clinical characteristics of COVID-19 have been documented in patients from various regions. Evidently, it is imperative that nurses near patients possess a comprehensive understanding of clinical characteristics within the distinctive framework of urban citizenship.

Such nursing knowledge serves as a fundamental asset in the surveillance and strategic invention of patient healthcare as well as preparing the preventive measures of COVID-19 transmission. In brief, a consideration of the patient service setting within each nursing sector underscores the necessity of a foundational comprehension of clinical characteristics to effectively orchestrate the tailored progression of nursing practices⁶.

Objectives

The objectives were to describe the clinical, laboratory, and radiological characteristics of the confirmed cases of SARS-CoV-2 infection and to follow the clinical outcomes of critical COVID-19 patient in the Vajira Hospital to be the nursing knowledge for suitable practice in patient healthcare.

Material and Methods

Participants and data collection. This retrospective descriptive study focused on seven COVID-19 patients, which was defined as a purposive sampling, in the Vajira Hospital during the period of August to September 2020.

Procedures. Data in chart reviews were collected in the record form by which the index of item-objective congruence (IOC = 0.8) and content validity index (CVI = 0.9) were determined. Firstly, we encompassed demographic information, exposure history, clinical characteristics, chest X-ray and chest CT scans, and laboratory test results. The laboratory testing included counting white blood cells (WBCs), lymphocytes, eosinophils, and platelets. Biomarkers and biochemical testing in the serum, such as C-reactive protein (CRP), procalcitonin (PCT), lactate, sodium, potassium, and interleukin-6 (IL-6), were specifically analyzed in severe cases. Chest X-rays were performed for all patients upon admission, while chest CT scans were conducted only for critical

COVID-19 patients. Severe illness was defined by the diagnosis of progressive pneumonia, while critical COVID-19 was determined by the need for ICU admission and connection to a ventilator via an endotracheal tube. Secondly, we considered in term of microbiology. The infected patients with SARS-CoV-2 were confirmed by real-time RT-PCR, targeting the viral N and ORF1ab genes. A Ct value of <37 was considered a positive result. Additionally, for patients who presented fever, rapid test kits were employed to simultaneously screen for influenza A and B infections. Lastly, we detailed the patients who were diagnosed with pneumonia underwent further testing for bacterial co-infections, particularly *Mycobacterium tuberculosis*, using sputum culture and acid-fast staining. To investigate bacteraemia in patients with prolonged fever, urine culture and blood culture were performed. Stool samples from patients with diarrhea were collected to determine pathogenic enteric bacteria. In the case of people who have a risky history, HIV and hepatitis examinations were conducted.

Statistical analysis. Data collected as continuous values were represented as mean \pm sd, median, and simple range. The categorical values were expressed as numbers and percentages. Data analysis was computed using Office365 software (Academic License).

Ethical approval statement

This study was approved on August 6, 2020, by the Vajira Hospital Ethic Committee (COA099/2020), and written informed consent was received from patients prior to enrolment and data collection.

Results

Demographic information and clinical symptoms on admission. We included seven patients who tested positive for SARS-CoV-2 using real-time RT-PCR.

Table 1 Demographic information and baseline characteristics of seven COVID-19 patients on admission

Demographics and Characteristics	Patients (n = 7)	Disease severity	
		Non-severe (n = 5)	Severe (n = 2)
Age—median (max-min)	35 (20-66)	27 (20-59)	55.5 (45-66)
Gender—no. (%)			
Female	2 (28.6)	2 (40)	0 (0)
Male	5 (71.4)	3 (60)	2 (100)
Body mass index (BMI)—mean±sd (obesity; ≥30)	22.5±3.6	21.2±3.4	25.8±0.7
Exposure history—no./total no. (%)			
Tourism contact	3 (42.9)	1 (20)	2 (100)
Community contact	4 (57.1)	4 (80)	0 (0)
Chief complaint on admission—no./total no. (%)			
Cough	6 (85.7)	4 (80)	2 (100)
Sore throat	5 (71.4)	4 (80)	1 (50)
Fever (>37.5°C)	3 (42.9)	1 (20)	2 (100)
Shortness of breath	2 (28.6)	0 (0)	2 (100)
Rhinorrhea	1 (14.3)	1 (20)	0 (0)
One sign and symptom	1 (14.3)	1 (20)	0 (0)
More than one sign and symptom	6 (85.7)	4 (80)	2 (100)
Comorbidity—no./total no. (%)			
Diabetes mellitus type 2	1 (14.3)	0 (0)	1 (50)
Chronic kidney disease stage 4	1 (14.3)	0 (0)	1 (50)
Hypertension	1 (14.3)	0 (0)	1 (50)
Dyslipidemia	1 (14.3)	0 (0)	1 (50)
Mature depressive disorder	1 (14.3)	1 (20)	0 (0)
Previous history of TB—no./total no. (%)	1 (14.3)	1 (20)	0 (0)
Allergy history—no./total no. (%)	1 (14.3)	1 (20)	0 (0)
Surgery history—no./total no. (%)			
Open reduction of fracture with internal fixation	1 (14.3)	0 (0)	1 (50)
Appendectomy	1 (14.3)	1 (20)	0 (0)
Incision with drainage of skin and subcutaneous tissue	1 (14.3)	1 (20)	0 (0)
Smoker—no./total no. (%)	2 (28.6)	1 (20)	1 (50)
Vaccination—no./total no. (%); Influenza A	1 (14.3)	1 (20)	0 (0)
Chest X-ray— no./total no. (%); Abnormal finding	3 (42.9)	1 (20)	2 (100)
- Bilateral lung	1 (33.3)	0 (0)	1 (50)
- Single lung—right	2 (66.6)	1 (20)	1 (50)

From table 1, the median age was 35 years, ranging from 20 to 66 years. All patients were suspected to have contracted SARS-CoV-2 infection through direct exposure to tourism or community contacts. The chief complaints of the infected patients were observed. In the case of the two severe patients, the main symptoms were cough, fever, and shortness of breath. One had pre-existing comorbidities, including diabetes mellitus type 2, chronic kidney disease stage 4, and hypertension. This severe patient was a current smoker with a long history of smoking. The other progressed to critical COVID-19 symptoms but had no risk factors or comorbidities. Chest X-rays were

performed in all patients, revealing abnormalities in three cases. One non-severe and one severe cases showed aberrations in a single lung, while the severe case displayed bilateral lung abnormalities. The ground glass opacity (GGO) and haziness exhibited in the right lung on the chest X-ray in common patients, whereas the patchy opacity and small ground glass opacity showed in both lungs of the severe patient.

Characteristics, radiological and hematological findings during hospitalization. Throughout hospitalization, common clinical characteristics in COVID-19 patients were described.

Table 2 Characteristics and laboratory findings of seven COVID-19 patients during hospitalization

Characteristics	All patients (n = 7)	Disease severity	
		Non-severe (n = 5)	Severe (n = 2)
Clinical characteristics—no./total no. (%)			
Fever (>37.5°C)	7 (100)	5 (100)	2 (100)
Cough	6 (85.7)	4 (80)	2 (100)
Fatigue	5 (71.4)	4 (80)	2 (100)
Chest tightness/dyspnea	3 (42.9)	2 (40)	1 (50)
Diarrhea	3 (42.9)	2 (40)	1 (50)
Abdominal pain	1 (14.3)	0 (0)	1 (50)
Emesis	1 (14.3)	0 (0)	1 (50)
Coffee ground	1 (14.3)	0 (0)	1 (50)
Radiological characteristics—no./total no. (%)			
Chest CT—Abnormal finding			
Bilateral lung; multifocal peripheral consolidation/Ground glass opacity	1 (14.3)	0 (0)	1 (50)
Complication—no./total no. (%)			
Acute respiratory distress syndrome (ARDS)	1 (14.3)	0 (0)	1 (50)
Admission to ICU—no./total no. (%)			
	1 (14.3)	0 (0)	1 (50)
Hospitalized periods—mean±sd			
	11.7±8.1	7.2±2.4	23.0±4.2
Clinical outcome—no./total no. (%)			
Discharged cases	7 (100)	5 (100)	2 (100)
Blood tests			
Leucocytes—mean±sd ($\times 10^3$ cell/mm 3 ; normal = 4-10)	5.4±0.9	5.4±1.0	5.5±0.9
Lymphocytes—mean±sd (normal = 20-45%)	30.0±9.6	34.5±5.3	18.8±9.8
<20%—no./total no. (%)	1 (14.3)	0 (0)	1 (50)
Eosinophils—mean±sd (normal = 0-8%)	1.5±1.1	1.5±1.0	1.4±2.0
Platelet count—mean±sd ($\times 10^3$ cell/mm 3 ; normal=150-400)	229.7±57.4	236.4±66.0	213.0±39.6

From table 2, the clinical characteristics consist of fever (100%), cough (85.7%), fatigue (71.4%), chest tightness/dyspnea (42.9%), and diarrhea (28.6%). However, severe patients exclusively experienced abdominal pain (14.3%), emesis (14.3%), and coffee ground (14.3%). Only one severe patient exhibited lymphopenia with a count of 11.9×10^3 cells/mm³. The patient with abnormalities in both lungs upon admission subsequently developed severe pneumonia and acute respiratory distress syndrome (ARDS), necessitating admission to ICU. Severe patients had longer hospital stays compared to non-severe patients. Nonetheless, all patients successfully recovered and were discharged within four weeks. In severe and critical patients, biomarkers of acute inflammation (CRP and IL-6), bacterial systemic infection (PCT and lactate), and gastrointestinal symptoms (Na⁺ and K⁺) were evaluated. The raised levels of CRP (>10 mg/L) and IL-6 (>7 pg/ml) were detected in both patients, while the remaining biomarkers fell within the normal range.

Microbial laboratory testing. Nasopharyngeal and throat swabs were collected from all patients to detect SARS-CoV-2 genome. The real-time PCR yielded positive results for patients with chief complaints upon admission. The cycle thresholds (Ct) for severe and critical COVID-19 patients were 19.31 and 33.83, respectively. Furthermore, four patients were tested for influenza A and B infections to rule out the possibility of influenza viruses causing high fever, and the results came back negative. Additionally, one patient, who worked as a bar-host, underwent further testing for HIV infection, which yielded a negative result. In the critical COVID-19 patient, the presence of HBV antibodies was detected, indicating a pre-existing HBV infection.

Clinical characteristics of critical COVID-19.

The 45-year-old man presented with cough, fever, and shortness of breath. He experienced a prolonged fever

($>38^{\circ}\text{C}$) that persisted for 14 days. On day 3, acute gastroenteritis (AGE) and colitis were observed, followed by signs of liver injury on day 6. A chest CT scan performed on day 6 revealed multifocal peripheral consolidation (MPC) and GGO in both lungs (Figure 2b). By day 7, he developed acute respiratory distress syndrome (ARDS) with low peripheral oxygen saturation ($\text{SpO}_2 < 96$) and acute respiratory failure. The ward's nurse watchfully monitored the breathing rate and oxygen supply in the patient to inform the physician appropriately. Oxygen support was provided through an endotracheal tube, and on day 8, he was transferred to ICU in an isolation room. On day 12, he experienced gastrointestinal hemorrhage (GIH) with coffee ground appearance and diarrhea. Increased levels of aspartate aminotransferase (AST) and alanine aminotransferase (ALT), biomarkers indicating liver injury, were detected on day 6. Additionally, the presence of HBV antibodies was confirmed on day 27. The antiviral drug was initiated with oseltamivir for 5 days, followed by chloroquine+lopinavir/ritonavir on day 6 and favipiravir on day 7. On day 16, a subsequent viral RNA test became a negative result. The antiviral drugs were discontinued on day 17, while antibiotic treatments continued for >4 days. Ultimately, the patient recovered and was discharged on day 28 which the nurse suggested prevention and disease transmission as well as self-observation in abnormal breathing and deficit oxygen condition toward patients and their family members.

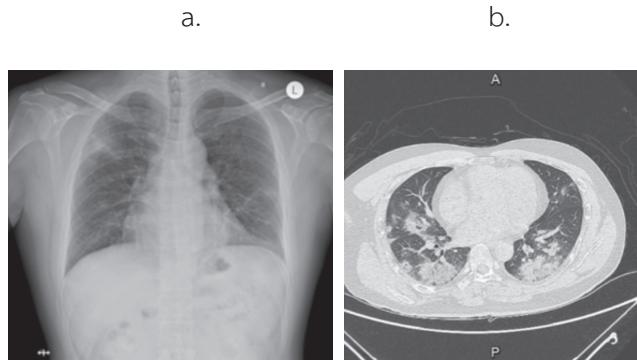


Figure 1 The chest X-ray photograph and chest CT scan of the critical COVID-19 patient. (a) The chest X-ray showed bilateral abnormality in both lungs. (b) The chest CT showed MPC and GGO in both lungs.

Nurses played a role in caring for COVID-19 patients, managing supportive care, notifying physicians in closely monitoring cases, and performing a treatment plan, as well as infection control. Discriminating between non-severe and severe cases of COVID-19 is necessary in nursing roles to provide appropriate care and prioritize resources effectively. The key knowledges acquired from this study included geodemography of patients, understanding symptom differentiation, vital signs monitoring, risk assessment, assessing disease severity, respiratory support, fluid management, and critical care interventions.

Discussion

The COVID-19 outbreak in Thailand began with the first reported case on January 8, 2020^{7,8}. The Vajira Hospital had been designated by the government for managing COVID-19. During the initial outbreak, individuals suspected of being at risk underwent real-time PCR testing. We enrolled seven COVID-19 patients who showed chief complaints upon admission. These complaints included cough, sore throat, fever, and shortness of breath, which are commonly recognized symptoms associated with COVID-19⁹. Among patients, two male patients developed severe symptoms, and one progressed to critical symptoms. Consistent with severe COVID-19 cases, common features such as GGO and consolidation in the bilateral lungs were observed. These features are known to contribute to the development of dyspnea and ARDS commonly associated with severe COVID-19¹⁰. Previous reports highlighted risk factors associated with the severity of COVID-19, including the elderly, obesity, and

comorbidities¹¹⁻¹³. In contrast, this study observed that critical COVID-19 did not possess such risk factors. On day 7, a deterioration in respiratory symptoms was observed, coinciding with a timeframe consistent with previously reported cases¹. Moreover, he possessed the anti-HBV antibody, implying a pre-existing HBV infection. The severity of COVID-19 symptoms could potentially be mitigated due to the indirect interaction between the HBV antibody and SARS-CoV-2¹⁴. Nevertheless, another study revealed no correlation between pre-existing HBV infection and the severity of COVID-19 symptoms¹⁵. Moreover, patients with severe and critical COVID-19 display elevated levels of inflammatory biomarkers such as CRP and IL-6, which can potentially serve as prognostic indicators¹⁶. Curiously, in a specific case study involving a 66-year-old male patient with underlying health conditions, the individual demonstrated lower levels of CRP, IL-6, and lymphopenia compared to a critical COVID-19 case. Despite these factors, the patient still developed pneumonia without any complications. These findings underscore the need for further research to better understand the risk factors associated with the disease and improve nursing healthcare for severe COVID-19.

During that period, no specific antiviral medications were available to treat COVID-19. However, the critical COVID-19 was administered oseltamivir. Oseltamivir was repurposed for use against SARS-CoV due to the similarity between the active site on the spike protein of SARS-CoV and the structure of neuraminidase¹⁷. However, our findings were consistent with the ineffectiveness of oseltamivir in treating COVID-19¹⁸. In contrast to favipiravir emerged as a promising antiviral drug. It has demonstrated broad-spectrum activity against RNA viruses, including SARS-CoV-2, in vitro¹⁹⁻²⁰. The critical COVID-19 received favipiravir on day 7, initially coinciding with worsening respiratory symptoms.

Additionally, a combination of lopinavir/ritonavir (LPV/r) and chloroquine was administered from day 6 to day 17. Chloroquine began as the most recommended drug to inhibit SARS-CoV-2 replication, supported by in vitro studies demonstrating their antiviral activity against the virus²¹. However, the use of chloroquine as a treatment for COVID-19 was eventually discontinued due to its inefficacy in COVID-19²². Notably, coffee ground appearance and diarrhea occurred during the antiviral treatment. These adverse effects could potentially be attributed to the gastrointestinal side effects associated with LPV/r and chloroquine that caused hepatotoxicity²³.

The nursing role derived from the implementation of the seven COVID-19, including clinical characteristics, laboratory results, radiological results, patient's medical history, and congenital disease, encompassed the integration of prevention and disease control, enabling nurses to provide guidance to patients for self-management. In case of critical COVID-19, nurses adeptly monitored symptom fluctuations, thereby facilitating timely intervention to aid patients. Moreover, the knowledge of this study could aid in the nursing process and the establishment of clinical nursing practice guideline for COVID-19 patients. Consequently, through vigilant nursing care, individuals afflicted with critical COVID-19 were able to recover and be discharged²⁴. Besides, being able to differentiate between non-severe and severe cases is pivotal for nurses to provide timely interventions, appropriate care, and ensure optimal outcomes for patients affected by COVID-19.

Recommendations from this study

According to the first wave of COVID-19 outbreak in Thailand, we only collected seven cases in this study. Although a major limitation of our study is the small sample size of patients included in this investigation, we represented the actual total

COVID-19 admitted to the Vajira Hospital. We propose that a larger sample size would be desirable to draw more conclusive correlations between specific characteristics or biomarkers and COVID-19 disease outcomes.

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