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CRITICAL DEGREE OF COVID-19 PNEUMONIA AN A MAN WITH HIV

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Covid-19, HIV/AIDS, CT Value.

ABSTRACT

Severe acute respiratory syndrome corona virus-2 (SARS-CoV-2), appeared in the city of Wuhan, China. SARS-CoV-2 causes the Coronavirus disease 2019 (COVID-19), which has resulted in the most devastating pandemic in modern world history. Epidemiological data show that COVID-19 infection with a poor prognosis occurs in the general population with chronic systemic immune deficiency and inflammatory conditions in patients. People with HIV/AIDS (ODHA) have a higher risk of being infected with COVID-19. Research related to COVID-19 infection in HIV/AIDS patients still yields different results in terms of susceptibility to infection, clinical characteristics, severity of symptoms, and prognosis. It is aimed that this case will provide an up-to-date picture of the incidence of COVID-19 in HIV cases The method used in this study is qualitative and a case study of shortness of breath patients. Clinical characteristics of COVID-19 patients and age range 26-82 years. In hospitalized patients, the appropriate treatment strategy depends on the severity of the disease. Treatment for COVID-19 patients with HIV co-infection is the same as for COVID-19 without HIV infection. Immunosuppression in COVID-19 can delay viral clearance and prolong the course of the disease. Monitoring viral load and CD4 count are variables that influence the severity of symptoms. Critical degree Covid 19 patients with HIV have a poor prognosis, but with adequate management the patient experiences clinical improvement and can go home for independent isolation.

INTRODUCTION

In December 2019, a new corona virus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), appeared in the city of Wuhan, China. SARS-CoV-2 causes the coronavirus disease 2019 (COVID-19), which has resulted in the most devastating pandemic in modern world history. The clinical presentation of COVID-19 patients can be asymptomatic or consist of mild symptoms, from cough and fever to severe and life-threatening acute respiratory syndrome (ARDS), sepsis, multi-organ failure and death. There is no specific treatment currently for COVID-19 but organ function support needs to be provided when symptoms are severe, and severe cases require admission to hospital for supportive clinical management such as mechanical ventilation (Cooper et al., 2020; Zaim et al., 2020).

Several studies have shown that increasing age, hypertension and diabetes are risk factors that correlate with poorer clinical outcomes. Until now, little is known whether people living with HIV (PLWHA) are at greater risk than the general population. If left untreated, HIV infection results in a reduced number of CD4 T cells, leading to AIDS. AIDS was defined as a CD4 T-cell count <200 cells/μL or the presence of a disease that defines AIDS. In 2018, an estimated 37.9 million people worldwide had HIV infection, 23.3 million of whom were currently being treated with antiretroviral therapy (ART) (Jordan et al., 2020; Siedner & Triant, 2019; Vishnevetsky & Levy, 2020; Zheng et al., 2020). Eighty-six percent of those on

treatment had successful viral suppression, resulting in undetectable viral loads and non-transmissible disease. If ART is maintained and adhered to, people living with HIV are not in an immunocompromised condition. Nonetheless, PLWHA may be at risk of developing severe COVID-19, especially in areas where HIV infection is not well controlled. Research is limited regarding the impact of HIV on SARS-CoV-2 infection and whether it has any effect on the clinical outcome of COVID-19 (Cooper et al., 2020; Joob, 2020; Rodger et al., 2019).

In this case report, a case of a 39-year-old male patient with Pneumonia COVID-19 HIV/AIDS will be presented. It is aimed that this case will provide an up-to-date picture of the incidence of COVID-19 in HIV cases.

RESEARCH METHOD

The study used case study method. Moreover, the case is: a 39-year-old man complained of shortness of breath, cough and fever in the last seven days. The Sars Cov PCR examination showed a positive result with a ct value of 11.64. With a positive rapid HIV test with CD4 74 results. The patient also experienced increased levels of liver enzymes (SGOT 357, SGPT 346), LDH 1394, CRP 74.9, D-dimer 2.78, hyponatremia (Na 126), and decreased P/F values Ratio 107. Chest X-ray showed bilateral pneumonia. The patient received antiviral therapy with remdesivir for 10 days, levolfoxacin and ceftrikson antibiotics, prophylaxis for opportunistic infections (cotrimoxazole 960 mg) steroid metylprednisolone and fondaparinux for 5 days. The patient received ARV after 15 days of treatment. During the treatment period the patient experienced clinical improvement, decreased inflammatory markers, increased p/f ratio, increasing CT values and improving thoracic radiology. The patient was treated as an outpatient after being treated for 30 days.

RESULT AND DISCUSSION

Case

Mr. RN, 39 years old, ethnic Banjar, Muslim, self-employed, comes from Kotabaru district, South Kalimantan. Entered the Ulin Banjarmasin Regional General Hospital (RSUD) since August 13, 2022.

Disease History

Present medical history

The patient came with shortness of breath since 7 days before entering the hospital. Shortness of breath 3 days before admission to the hospital. Shortness of breath is not affected by position or activity. The patient also complained of fever since 7 days before entering the hospital, fever fluctuated with coughing up phlegm. Phlegm is white. Coughing up blood and chest pain was denied by the patient. The patient also complained of nausea and vomiting and decreased appetite. BAK and CHAPTER normal. Anosmia and ageusia are denied.

Past medical history

The patient had no history of diabetes mellitus, hypertension or bronchial asthma. Previous history of HIV is still unknown. History of changing sexual partners was denied. The patient has a history of diarrhea for almost one month. The complaint of thrush was denied. BB dropped dramatically in 1 month but did not weigh.

Social and Family History

The patient works as an entrepreneur. History of frequent change of sex partners was denied. The patient was not aware of any previous history of HIV. History of alcohol and drug use was denied. There is no family history of high blood pressure, diabetes and asthma.

Based on the data above, the list of fixed problems is; (1) Covid 19 critical degree, (2) CAP Severe, (3) HIV Stad II, (4) Normochromic normocytic anemia, (5) Transaminitis, and (6) Hyponatremia

Problem Analysis and Treatment Plan

Based on the list of fixed problems, a problem analysis is made as follows:

Table 1. Problem Analysis and Treatment Plan

No.	Problem List	Diagnostic Plan	Therapy Plan	Monitoring Plan
1.	Covid 19 degrees critical	-	02 NRM 15 LPM Ivfd Asering 800cc/24 hours Remdesivir drip 1x200 mg (h1) then 1x100 Drip resfar 25cc/24 hours Drip vitamin c 2x500 mg Inj. Methylprednisolone 2x31.25 Inj omeprazole 1x40 inj. Arixtra 1x2,5 POs: Vitamin D 1x5000 l-bio 2x1 zinc 1x20	Clinical Signs of bleeding, PT/APTT, D-Dimer AGD/clinical vital signs O2 Saturation,
2.	Severe CAP	Sputum gram, K/S sputum	Inj Ceftriaxone 3x2 gr Inj Levofloxacin 1x750 mg	Clinical DLO after 3 days AB vital signs O2 saturation
3.	HIV Stage II	Anti-HIV Elisa CD4 Consul IPD tropical infections	Cotrimoxazole 1x960 mg PO	TTV, clinical CD4
4.	Anemia	Peripheral blood smear examination	-	K/TTV, Hb examination
5.	Transaminitis	Abdominal ultrasound Gastrohepatology IPD consultation	Hepatoprotector 3x1 caps PO	Clinical vital signs SGOT/SGPT , bilirubin per 3 days
6.	Hyponatremia	Urine electrolytes	IVFD NS 500 cc/24 hours	K/TTV, post-correction SE examination

Table 2. Notes on the progress and course of the patient's disease

Assessment	13-15 August 2022	August 16-19, 2022	August 20-27, 2022	September 2-13, 2022
	1. Covid 19 degrees critical 2. CAP Severe 3. HIV Stage II 4. Normochromic normocytic anemia 5. Transaminitis 6. Hyponatremia	1.Covid 19 degrees critical 2. CAP Severe 3. HIV Stage II 4.Normochromic normocytic anemia 5. Transaminitis 6. Hyponatremia 7. hypoalbumin	1.Covid 19 degrees critical 2. CAP Severe Improvements 3. HIV Stage II 4.Normochromic normocytic anemia 5. Transaminitis 6. Hyponatremia 7. hypoalbumin 8. constipation 9. Stomatitis	1.Covid 19 degrees critical 2. CAP Severe Improvements 3. HIV Stage II 4.Normochromic normocytic anemia 5. Transaminitis 6. Hyponatremia 7. hypoalbumin 8. constipation 9. Stomatitis
Monitoring	Clinical, vital signs	Clinical, vital signs	Clinical, vital signs	Clinical, vital signs
PlanningDiagnosis	Clinical Signs of bleeding, PT/APTT, D-Dimer AGD/clinical	Clinical Signs of bleeding, PT/APTT, D-Dimer	Clinical Signs of bleeding, PT/APTT, D-Dimer	Clinical Signs of bleeding, PT/APTT, D-Dimer

Assessment	13-15 August 2022	August 16-19, 2022	August 20-27, 2022	September 2-13, 2022
	vital signs O2 Saturation,	AGD/clinical vital signs O2 Saturation,	AGD/clinical vital signs O2 Saturation,	AGD/clinical vital signs O2 Saturation,
Consul's reply				
Anesthesia(4/10/2021)				
In principle agreed to be treated in the ICU Covid room				

Discussion

Coronavirus disease (COVID)-19 is a condition of severe acute respiratory syndrome (SARS) caused by infection with the SARS-COV-2 virus which has now become a pandemic worldwide. Based on epidemiological data, patients who have comorbid diseases such as diabetes mellitus (DM), chronic kidney disease, hypertension, heart disease, and chronic lung disease are more susceptible to COVID-19 infection with a worse prognosis than the general population due to chronic systemic immune deficiency. and inflammatory conditions in patients. Other immune deficiency conditions such as people with HIV/AIDS (PLWHA) are also considered to have a higher risk of being infected with COVID-19 with a worse prognosis (C. Huang et al., 2020; WHO, nd; Widiasari et al., 2020). Research related to COVID-19 infection in HIV/AIDS patients still yields different results in terms of susceptibility to infection, clinical characteristics, severity of symptoms, and prognosis (Widiasari et al., 2020). In this case report, a man with HIV/AIDS suffers from COVID-19.

The patient came with a diagnosis of Critical Covid-19, Severe CAP, Stage II HIV, Transaminitis, Hypochromic Microcytic Anemia, and Hyponatremia. The patient received Resfar drip therapy 25cc/24 hours, Vitamin C drip 2x500 mg, Remdesivir drip 1x200 mg (H1) continued 1x100 mg, Inj. Ceftriaxone 2x1 gram, Inj. Levofloxacin 1x750mg, Inj. Arixtra 1x2.5, Cotrimoxazol 1x960 mg, Vit D 1x5000 iu, Lbio 2x1 sac, Zinc 1x20mg, O2 NRM, Diet TKTP 1700 kcal, IVFD aser 1500 ml/24 hours, Omeprazole 1x40 mg, PCT 3x1 gk/p fever, HP pro 3x1 and CPG 1x75 mg.

In patients with severe or critical Covid-19 degrees, based on the Covid-19 Edition 4 Patient guidelines, namely isolation in the isolation room of the Intensive Care Unit (ICU) or High Care Unit (HCU) of a Referral Hospital. COVID-19 intensive care. It is very important for earlier and complete intervention for critically ill patients with COVID-19. Patients need complete rest, adequate caloric intake, electrolyte control, hydration status (fluid therapy), and oxygen. Complete peripheral blood laboratory monitoring with type count, if possible add CRP, kidney function, liver function, Hemostasis, LDH, D-dimer. Examination of serial chest X-ray if worsening. Monitor clinical signs such as tachypnea, respiratory rate ≥ 30x/min, oxygen saturation with pulse oximetry ≤93% (on the finger), - PaO2/FiO2 ≤ 300 mmHg, increase by > >50% in lung area involvement on chest imaging within 24-48 hours, progressive lymphopenia, progressively elevated CRP and progressive lactic acidosis (Burhan, 2020).

Initiate oxygen therapy if SpO2 is found to be 94%. Increase oxygen therapy using an HFNC (High Flow Nasal Cannula) device if there is no clinical improvement. 0.9% NaCl was also given intravenously (IV) drip during treatment. Pharmacology such as Vitamin B1 1 ampoule/24 hours/intravenously, Vitamin D Dosage of 1000-5000 IU/day (available in the form of 1000 IU tablets and 5000 IU chewable tablets). If there is a condition of sepsis that is strongly suspected due to bacterial co-infection, the selection of antibiotics is adjusted to the clinical condition, the focus of infection and the risk factors present in the patient. Blood cultures should be performed and sputum culture examination (with special caution) should be considered. Antiviral Remdesivir 200 mg IV drip (day 1) followed by 1x100 mg IV drip (day 2-5 or day 2-10) (Burhan, 2020).

Remdesivir is a nucleotide analog prodrug. This drug binds to RNA-dependent RNA polymerase and inhibits viral replication by terminating RNA transcription (Cooper et al., 2020). Remdesivir will enter the epithelium of the respiratory tract and will be metabolized in host cells into an active nucleoside triphosphate. This drug can inhibit RNA-dependent RNA polymerase through competition with adenosine triphosphate. In addition, nucleoside analogues can also enter the generating RNA strand and cause the viral replication process to be delayed (Yousaf et al., 2021). In in vitro tests, it was found that remdesivir had antiviral activity against SARS-CoV-2 in human airway epithelial cultures. The half maximal effective concentration (EC50) of this drug is 0.01 M (Siedner & Triant, 2019). Remdesivir is administered intravenously and is available as a lyophilized solution and/or powder to be administered as an infusion over 30-120 minutes. The Food and Drug Administration (FDA) allows the administration of remdesivir as a COVID-19 therapy for adults and children aged ≥ 28 days and weighing ≥ 3 kg. In hospitalized patients, remdesivir is given for 5 days or until the patient is discharged (choose the shorter duration). Whereas in patients who are not treated, but are at high risk of severe symptoms, remdesivir should be given within the first 7 days of symptom onset for 3 days. The recommended dosing regimen is a single dose of 200 mg on the first day, followed by 100 mg once a day in the following days (the duration of treatment is not more than 10 days) (Vishnevetsky & Levy, 2020). The use of remdesivir in special populations such as pregnant women, can be given if the benefits outweigh the risks to the mother and fetus. For patients with end-stage renal disease (ESRD), its safety has not been established, but its use is not recommended in adults and children with an eGFR less than 30 ml/min. The use of remdesivir in patients with hepatic impairment is permitted if the potential risk is considered to be small (Jordan et al., 2020). Remdesivir can interact with rifampicin, carbamazepine and phenytoin so it should not be given simultaneously (Rodger et al., 2019).

In critically ill COVID-19 patients, sepsis is often suspected due to bacterial co-infection. Consideration of giving antibiotics based on clinical conditions, focus of infection, and patient risk factors. A blood culture should be obtained and a sputum culture may also be considered (Joob, 2020). A study by Mustafa et al., described that there was a 100% increase in the use of antibiotics in patients treated in the ICU. The use of antibiotics in outpatients is as much as 25%, while in patients admitted to the hospital it increases to 90%. For patients admitted to the ICU, antibiotics were administered to all patients (Widiasari et al., 2020). Similar use of antibiotics was also found in another study by Miranda et al., This was associated with severe clinical manifestations in patients as well as laboratory markers indicating ongoing active inflammation (Widiasari et al., 2020).

In COVID-19 patients, especially those with severe or critical degrees, it will be difficult to distinguish whether the worsening is due to co-infection or a manifestation of a cytokine storm. Markers such as procalcitonin cannot be used solely to determine the administration or delay of antibiotics. Therefore, currently, antibiotics should be administered to patients with a high suspicion of bacterial co-infection. In addition to COVID-19 patients who are immunocompromised, antibiotics can be given before other supporting results are available because of the possibility of rapid deterioration if these patients experience bacterial co-infection. Immunocompromised itself includes patients undergoing chemotherapy, post-transplant, immunodeficiency, HIV or AIDS, taking corticosteroids or other immunosuppressive agents. Based on available data, secondary bacterial infections can be found in more than 20% of critically ill COVID-19 patients. There are no studies that have compared the incidence of hospital-acquired pneumonia or ventilation-acquired pneumonia in critically ill COVID-19 patients with other critical illnesses, so for now it is recommended to give therapy for co-infection with COVID-19 the same pattern as other critical illness pathogens. These bacteria include Staphylococcus aureus, Enterobacterales, Pseudomonas aeruginosa, Acinobacter baumannii, and Haemophilus influenzae. The choice of antibiotics

given can follow the pattern of local antibiotic resistance There are no studies that have compared the incidence of hospital-acquired pneumonia or ventilation-acquired pneumonia in critically ill COVID-19 patients with other critical illnesses, so for now it is recommended to give therapy for co-infection with COVID-19 the same pattern as other critical illness pathogens. These bacteria include Staphylococcus aureus, Enterobacterales, Pseudomonas aeruginosa, Acinobacter baumannii, and Haemophilus influenzae. The choice of antibiotics given can follow the pattern of local antibiotic resistance There are no studies that have compared the incidence of hospital-acquired pneumonia or ventilation-acquired pneumonia in critically ill COVID-19 patients with other critical illnesses, so for now it is recommended to give therapy for co-infection with COVID-19 the same pattern as other critical illness pathogens. These bacteria include Staphylococcus aureus, Enterobacterales, Pseudomonas aeruginosa, Acinobacter baumannii, and Haemophilus influenzae. The choice of antibiotics given can follow the pattern of local antibiotic resistance Pseudomonas aeruginosa, Acinobacter baumannii, and Haemophilus influenzae. The choice of antibiotics given can follow the pattern of local antibiotic resistance Pseudomonas aeruginosa, Acinobacter baumannii, and Haemophilus influenzae. The choice of antibiotics given can follow the pattern of local antibiotic resistance (Huang et al., 2020). In this patient, because the patient is in a critical degree and has comorbid HIV, so there is a place for this patient to be given antibiotics. In patients with severe inpatient pneumonia, the standard regimen given is beta lactam with macrolides, or beta lactam with fluoroquinolones.

beta lactam in the form of ceftriaxone and fluoroquinolone in the form of levofloxacin. The recommended ceftriaxone is 1-2 grams per day, this patient was given ceftriaxone 2x1 gram. Ceftriaxone is administered intravenously in the form of a powder for injection of 1 gram per vial. For levofloxacin, the recommended dose is 750 mg per day. In this patient levofloxacin was given as much as 1x750 mg. Levofloxacin is available as an infusion solution. Based on existing studies there is no difference in outcome from administration of beta lactam and macrolides compared to fluoroquinolone monotherapy (WHO, n.d.).

Co-trimoxazole is routinely given as a prophylaxis to HIV patients with WHO stage 3 or 4, CD4 levels ≤ 200 cells/uL, and/or pregnant women. Co-trimoxazole is recommended to be given 2 weeks before starting anti-retroviral therapy (ARV) to avoid interactions between co-trimoxazole and ARV. In conditions where malaria and/or other bacterial infections are found, co-trimoxazole should be given regardless of WHO stage or CD4 count. The dose of co-trimoxazole for prophylaxis in HIV patients is 1x960 mg or 2x480 mg orally. Co-trimoxazole prophylaxis aims to reduce mortality due to infection by Pneumocystis jirovecii (Cooper et al., 2020).

In COVID-19 infection, co-trimoxazole prophylaxis is also considered anti-inflammatory. Co-trimoxazole can reduce pro-inflammatory markers such as C reactive protein (CRP) and tumor necrosis factor-alpha. Co-trimoxazole can suppress oxidative stress, especially in critically ill COVID-19 patients (Dandachi et al., 2021; Sun et al., 2021).

Other drugs such as enoxaparin are prophylactic anticoagulants given especially to severe and critical COVID-19 patients. 16 In a study by Klok et al (2020) it was found that complications in severe COVID-19 patients in the ICU covered 31% of cases of thrombosis, 27% venous thromboembolic cases, and 3.7% of arterial thrombotic cases. In COVID-19 patients, thrombus forms in the pulmonary arteries (Pulmonary Intravascular Coagulopathy/PIC). PIC itself will stimulate an inflammatory reaction resulting in hyperinflammation. In addition, the release of cytokines (IL-2, IL-6, and TNF) will stimulate coagulopathy and systemic thrombosis. Continuous coagulation and thrombosis will cause Multi Organ Dysfunction and then Multi-organ failure. 18 Based on a study by Novainti Fatli Azizah et al., It was reported that Enoxaparin 2x1596 ug/L reduced the average d-dimer. Prophylactic anticoagulants can be given while the patient is being treated. If the patient's

condition has gradually improved, the patient can be actively mobilized, the risk of thrombosis must be reassessed. If it is not high then the anticoagulant can be stopped (Härter et al., 2020).

Cycle threshold value (CT value) qualitatively describes the amount of viral RNA detected. Nowadays, many people conclude that a lower CT value indicates a greater amount of virus (Sarkar et al., 2020). CT value <21 has a three times greater risk of mortality. The CT value is found to be lowest when new symptoms appear (Rabaan et al., 2021). Study by Aranha et al (2020) reported that patients with a CT value of 31 or greater required a shorter time for RNA clearance. Based on a study by Brandolini et al (2015) showed that in patients with a number of viruses per uL of 102-106, the CT value was found to be 32 to 17. In this patient who was admitted with a CT value of 11.64 when repeated swab evaluations were performed, consistent positive results were found for quite a long time. This is associated with a weak initial CT, the patient's immune condition is weak so that the clearance of RNA lasts longer.

Treatment for COVID-19 in people with HIV is the same as for those who do not have HIV. When starting treatment for COVID-19 in patients with HIV, clinicians should be aware of potential drug-drug interactions and overlapping toxicities among COVID-19 treatments, ARV drugs, antimicrobial therapy, and other drugs. Treatment options for non-hospitalized patients with HIV include ritonavir-boosted nirmatrelvir (Paxlovid), intravenous remdesivir, bebtelovimab, and molnupiravir. Drug-drug interactions are a particular concern with ritonavir-enhanced nirmatrelvir. People with HIV on ritonavir- or cobicistat-based HAART can receive 5-day therapy of ritonavir-enhanced nirmatrelvir to treat COVID-19 without changing or interrupting their HAART (Cooper et al., 2020).

In hospitalized patients, the appropriate treatment strategy depends on the severity of the disease. Both tocilizumab and dexamethasone, which are recommended for some patients with severe or critical COVID-19, are immunosuppressive agents. The safety of using these drugs in immunocompromised patients, including those with advanced HIV, has not been studied. Therefore, patients with advanced HIV receiving these drugs should be monitored closely for secondary infections. Dexamethasone is a dose-dependent inducer of cytochrome P450 3A4 and has the potential to reduce the levels of certain antiretroviral drugs. More than a single dose of dexamethasone is not recommended for patients receiving rilpivirine as part of their ARV regimen (Cooper et al., 2020). Where possible, ART and opportunistic infection prophylaxis should be continued in patients with HIV who develop COVID-19, including those requiring hospitalization. Interruption of treatment can lead to rebound viremia and, in some cases, emergence of drug resistance. If suitable ARV drugs are not in the hospital formulary, administer drugs from the patient's home supply, if available (Cooper et al., 2020).

In a COVID-19 case series with HIV co-infection Cooper et al. Shows that viral load and CD4 count are variables that influence symptom severity, but are not related to an individual's susceptibility to COVID-19 infection (Cooper et al., 2020). In early case series of COVID-19 patients in Europe and the United States, no significant differences were observed in the clinical outcome of COVID-19 between people with HIV and people who did not have HIV13. In contrast, more recent reports show poorer outcomes for patients with HIV and COVID-19, including high COVID-19 death rates in cohort studies from the United States, United Kingdom, and South Africa13. In a multicenter cohort study of 286 patients with HIV and COVID-19 in the United States, a lower CD4 T lymphocyte (CD4) cell count (ie, <200 cells/mm3) was associated with a higher risk of admission to the intensive care unit (ICU). ICU), use of invasive mechanical ventilation, or death. This increased risk was observed even in patients who had achieved HIV virological suppression (Sun et al., 2021).

In the study by Huang et al. Regarding the clinical characteristics of COVID-19 patients in Wuhan, the average age of COVID-19 patients found is 49 years. The study involved 41 subjects, 32% of whom had comorbid diseases such as DM, hypertension and cardiovascular disease, but none had HIV infection. It was found that the median time of hospitalization was

7 days after the onset of symptoms and experiencing dyspnea 8 days after the onset of symptoms. This study also mentions some of the main symptoms experienced by patients including fever (98% of subjects), cough (76% of subjects), and myalgia or fatigue in 44% of subjects (C. Huang et al., 2020).

Another study by Harter et al. regarding the characteristics of COVID-19 cases with HIV infection, the average age was 48 years with an age range of 26-82 years. Some of the main symptoms found in patients include cough (78%), fever (69%), arthralgia or myalgia (22%), and sore throat (22%) (Härter et al., 2020). Case report by Patel et al. in 2020 regarding a 37-year-old COVID-19 patient with HIV infection and an absolute CD4 cell count of 34 cells/µL showing symptoms such as fever, dry cough, and chest pain since 1 month before being admitted to the hospital. Physical examination of the patient showed a high body temperature of 38.8°C, oxygen saturation (SpO2) of 85-90% in ambient air, with a high respiratory rate (40 beats/minute), and a pulse of 119 beats/minute (Patel, 2021). Based on the case report by Patel et al, the clinical severity of the patient may be affected by the possibility of secondary infection. Viremia also cannot be ruled out as a cause of more severe clinical symptoms in patients (Patel, 2021).

In the case report by Widiasari et al., the first COVID-19 patient with HIV infection showed normal laboratory and chest X-ray results. The second patient's laboratory examination showed an increased percentage of neutrophils, lymphopenia, and thrombocytopenia accompanied by a reticular pattern on the chest radiograph. The second patient also had chronic symptoms such as weight loss associated with tuberculous lymphadenitis in addition to signs of acute infection caused by bacteria or opportunistic infections (Widiasari et al., 2020).
In a study by Huang et al. in the COVID-19 population, only four patients (10%) had secondary infections and required intensive care. Laboratory results showed normal leukocyte values (in 45% of patients), with a mean absolute neutrophil count of 5 × 103/L, leukopenia occurred in 63% of patients, normal platelet values were found in 95% of patients, and predominantly decreased liver function and kidney (Huang et al., 2020).

It is important to pay attention to the CT Value in monitoring COVID-19 patients. The CT value or cycle threshold is the thermal cycle due to the fluorescent signal exceeding the background fluorescence. It is a semi-quantitative measure which helps in broad categorization of viral genetic material in patient samples after testing by RT PCR. This can vary and be classified as low, medium, or high. Standard RT-PCR tests run a maximum of 40 thermal cycles. A low ct indicates an increased concentration of genetic material, usually correlated with a high risk of infection. A high Ct value determines a lower risk of infectivity because it reflects a low concentration of viral genetic material. However, low viral load can also be caused by the incubation period or the recovery stage (Kashyap et al., 2020). An inverse correlation between SARS-CoV-2 Ct values and mortality (Huang et al., 2020). During previous MERS-CoV and SARS virus pandemics, a similar association of low Ct values with infection severity was reported (Feikin et al., 2015).

High CT values were found in several cases as follows (Rabaan et al., 2021); (1) asymptomatic infection with unknown risk of infectivity, (2) pre-symptomatic infection which can then progress to symptomatic infection with high viral load and infectivity, (3) during acute COVID-19 with a high risk of infectivity but there is interference with the sample, (4) individuals who are immunocompromised and hospitalized with critical illness are more likely to shed the potentially infectious virus longer.

In the case report, Yousaf et al, showed that a patient with comorbid HIV and Covid-19, even though he was in clinical recovery and ART, his COVID-19 PCR test continued to be positive with a ct rRT value.-PCR mean <30, which is considered secondary to her immunosuppressed state. On examination the patient was still positive for PCR with a CT value of less than 30 (infectious) for a total period of 85 days. ct rRT values-PCR began to improve

two weeks after starting ART with a CT Scan reaching a value of 30, considered not infected after a total of 6 weeks of ART. During this period, her CD4 count gradually increased to 42 (Yousaf et al., 2021).

It has been hypothesized that immunosuppression in COVID-19 can delay viral clearance and prolong the course of the disease. Kanwugu (2021) in his review showed a strong relationship between HIV and immunosuppression (CD4 count <200 or ≥200 cells per µL) to increasing the severity of COVID-19 (P = .005) but not clinical outcome (P = .275). Binary regression analysis of their data indicated that CD4 counts <200 cells per µL increased the risk of developing severe COVID-19. Vizcarra et al in their case series also showed that those with a high number of T cells-Low CD4 may have severe disease and prolonged viral shedding. Kanwugu et al also pointed out that there is no evidence that both viral suppression and HAART use have a meaningful impact on COVID severity-19 (Vizcarra et al., 2020).

In Blanco et al's research related to a series of cases in Barcelona, Spain regarding COVID-19 with HIV infection by Blanco et al. compared four patients who were on routine ARVs and had an absolute CD4+ count >200/uL and one patient who was not on ARVs and had a CD4+ count <200/uL. Two patients who had received ARV therapy had mild clinical symptoms without laboratory and chest X-ray abnormalities, two patients who received ARV had moderate symptoms, and one patient who did not have ARV and had a CD4+ count of 13 Cells/uL had severe symptoms of COVID-19 with signs of secondary bacterial infection such as an increase in leukocytes to 14,670 cells per 103/L. Lymphopenia occurred in two cases with ARV and one case without ARV with the lowest lymphocyte count being 900 cells per 103/L (Blanco et al., 2020).

In the case report of Wang et. al. show patients with different characteristics. They reported a COVID-19 patient with HIV infection with a CD4+ count of 34 Cells/µL having a severe clinical presentation but no leukocytosis or signs of secondary infection, especially bacterial infection (M. Wang et al., 2020). Other secondary infections that can occur in HIV patients are Pneumocystis carinii (Pneumocystis pneumonia [PCP]), tuberculosis, Hepatitis B, Hepatitis C, Cryptococcal Meningitis, and Toxoplasmosis. Can be considered to carry out a clinical evaluation of infection if a COVID-19 patient with HIV infection is found to improve the patient's prognostic results, especially HIV / AIDS patients who have a CD4 + count < 200 Cells / uL (Vaillant & Up, 2021).

Secondary infection is also often associated with Covid-19 patients with HIV comorbidities. Based on research conducted by Huson et al. Shows that patients with bacteremia have an average increase in leukocytes in HIV patients lower than non-HIV patients. The study was conducted on patients with an average CD4+ of 150 cells/µL (Huson et al., 2014). In the case series reported by Blanco et al, HIV patients who had CD4+ counts >200 cells/uL and were already taking antiretroviral drugs routinely showed higher leukocyte counts than HIV patients with CD4+ counts <200 cells/uL and had not received ARVs. Lymphopenia and thrombocytopenia are accompanied by a reticular pattern on the chest radiograph consistent with signs of viral infection. Mild anemia can be caused by chronic inflammation from tuberculosis and HIV. Nutritional intake from food can also affect the occurrence of anemia in patients. Severe lymphopenia in HIV/AIDS patients with COVID-19 can affect the severity of symptoms (Blanco et al., 2020).

Treatment recommendations for COVID-19 patients with HIV co-infection are similar to those for COVID-19 without HIV infection. The high risk of secondary infection in HIV/AIDS patients makes optimization of secondary infection therapy very important (Widiasari et al., 2020). Giving systemic steroids to COVID-19 patients with HIV infection is still recommended, especially in patients with clinically severe COVID-19 or with secondary infection in severe forms of PCP, although systemic steroid administration in a study conducted

by Huang (2020) and Wang 2020 said it could slow down virus clearance and extend the virus shedding period (Wang et al., 2020).

The recommendation issued by British and American health agencies for people with HIV during a pandemic is to ensure that they have a good supply of ARVs and that they are vaccinated against Influenza and Pneumococci regularly. To date, there have been no specific reports regarding the relationship between the type of ARV used and the severity of COVID-19 symptoms in patients with HIV, but there are case series that show clinical differences in patients with different ARV histories. A case series report by Blanco et al (2020) showed that two patients taking the combination ARVs tenofovir alafenamide, emtricitabine, and Darunavir-boosted Cobicistat had mild symptoms of COVID-19 and two patients taking the combination ARVs abacavir, lamivudine, and dolutegravir had moderate to severe COVID-19 presentations and required intensive care. The combination of Lopinavir and Ritonavir in in vitro studies may shorten the viral shedding period, but its effectiveness in COVID-19 clinical studies has not been shown to significantly improve patient outcomes compared to standard therapy (Yan et al., 2020).

The outcome of COVID-19 patients can be assessed based on the length of time to achieve a negative result in nasopharyngeal RT-PCR swab and the risk of morbidity and mortality. Case report by Wang et al. in 2020 regarding COVID-19 patients with HIV infection who had CD4+ counts <200 Cells/µL reported only getting positive results on the first RT-PCR and negative on 3 RT-PCR nasopharyngeal swab evaluations. This is due to the base value of each CT, but cannot be compared due to using kits with different target genes. Another possibility is that the patient's second shedding of virus on the day of evaluation was found in the sputum, thus not being detected in the nasopharyngeal swab specimen27. The two cases reported by Menghua et.al showed long COVID 19 cases and it took 28 days to get a negative RT-PCR swab, but, in this case, RT-PCR was performed on the sputum specimen. This condition could be due to prolonged viral shedding in patients associated with impaired cellular function of CD4+ cells even though CD4+ cell counts are within normal limits (Wang et al., 2020).

CONCLUSION

Mr. Case Rn, 37 years old, is a case of critical degree Covid 19 pneumonia accompanied by stage II HIV. The patient was treated in the covid icu for 15 days and in the isolation room for 16 days. During the treatment, an evaluation swab examination was carried out 4 times to get positive results. The patient started ARV treatment after 15 days of treatment. The patient went home from the hospital, doing independent isolation.

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