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CASE REPORT

Comorbid Factors Influencing COVID-19 Patient Mortality at Royal Prima Hospital in 2021

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ABSTRACT

Background: *Corona Virus Disease-19 (COVID-19) is caused by the Severe Acute Respiratory Syndrome Corona Virus-2 (SARS-CoV2). COVID-19 was declared a pandemic by the World Health Organization (WHO) on December 31, 2019, originating in Wuhan, China. Indonesia confirmed its first case on March 2, 2020. As of January 2, 2022, the government reported 4,263,168 confirmed cases and approximately 144,097 COVID-19-related deaths. The presence of comorbidities is one of the causes of death, as a history of comorbidities increases the severity of the disease leading to death.*

Research Objectives: *To find out the relationship between one comorbid, namely HT, DM or Heart with COVID-19 at the Hospital which can cause death and to find out the relationship between two comorbids, namely HT with DM or HT with Heart or DM with Heart with COVID-19 at home. Illness that can lead to death*

Results: *The results found were that there was a relationship between the type of comorbidity and the number of deaths in COVID-19 patients, this was based on a bivariate statistical test using the chi-square test, p value <0.05. This shows that there is a significant relationship between the type of comorbidity and the number of comorbidities on the severity of patients with confirmed COVID-19.* ***Conclusion****: The results of this study show that comorbidities are one of the factors that play a role in causing severity in COVID-19 patients and even death. The most common comorbidities were HT, DM for single comorbid and for multiple comorbids were DM with HT, DM with heart.*

Keywords: *COVID-19, Comorbid, Death*

INTRODUCTION

Coronavirus Disease-19, also known as COVID-19, is a disease caused by the Severe Acute Respiratory Syndrome Corona Virus-2 (SARS-CoV-2). (1) The etiology of COVID-19 is a single-strain, capsulated, non-segmented RNA virus belonging to the order Nidovirales and family Coronaviridae. It has four main protein structures: the N protein (nucleoplasmid), the M glycoprotein (membrane), and the S glycoprotein (spike). (2)

Some people infected with this virus will experience mild or moderate respiratory symptoms, and in some cases, they can become very severe and require hospitalization. General patient symptoms are defined as asymptomatic, mild, moderate, severe, or critically ill, according to the WHO and the Ethiopian national diagnosis. Mild COVID-19 symptoms are defined as mild clinical symptoms without respiratory distress and the absence of imaging manifestations of pneumonia, but with a positive nucleic acid test result. Moderate symptoms are defined as the presence of clinical symptoms of pneumonia (fever, cough, shortness of breath, and rapid breathing) but without symptoms of severe pneumonia, including SpO2 ≥ 90% at room temperature. Severe symptoms are defined as the presence of at least one of three conditions: respiratory distress, respiratory rate ≥30 breaths/minute; resting oxygen saturation ≤ 90%; or arterial blood oxygen partial pressure/oxygen concentration ≤200 mmHg. Critical illness is defined as respiratory failure requiring mechanical ventilation, shock, or combined organ failure requiring intensive care unit (ICU) monitoring and care. Patients infected with SARS-CoV-2 can develop severe pneumonia and respiratory failure, which often require ICU care.(6)

METHOD

This study utilized a **cross-sectional** analysis.

Independent Variables: COVID-19 patients who died , and the comorbidities: Hypertension (HT), Diabetes Mellitus (DM), Heart disease, and combinations of these comorbidities.

Dependent Variable: All patients confirmed with COVID-19.

Sampling Technique: Secondary sample using medical records with nonprobability sampling, specifically consecutive sampling.

Inclusion Criteria:

- COVID-19 patients with comorbidities who died or were discharged (PBJ).
- Age >30 years.
- Comorbidities: HT, DM, Heart, HT and DM, HT and Heart, DM and Heart, HT, DM, and Heart.

Exclusion Criteria: No comorbidities, other comorbidities not included in the inclusion criteria, and incomplete medical records.

Statistical Analysis: Bivariate statistical test using the chi-square test.

RESULTS

Based on the results of the bivariate statistical test using the chi-square test, a p-value of <0.004 was obtained. This indicates a relationship between the type of comorbidity and the incidence of death in confirmed COVID-19 patients. Table 1 shows that :

Number Of Comorbidities	PBJ		Die				*p value*
HT	24	24	18	18	42	42	0.004
DM	14	14	10	10	24	24	
Jantung	6	6	1	1	7	7	
Kombinasi	6	6	21	21	27	27	

Based on the results of the bivariate statistical test using the chi-square test, a p-value of <0.003 was obtained. This indicates a relationship between the number of comorbidities and the incidence of death in confirmed COVID-19 patients Table 2 :

Type of Comorbid	Status		Totalp value
	(PBJ)	Died	
HT	24	18	42 0.004 [29]
DM	14	10	24
Heart	6	1	7
Combination	6	21	27
Total	**50**	**50**	**100**

Table 1. Relationship between Type of Comorbidity and Death Incident in Confirmed COVID-19 Patients

viruses and touching the mouth, nose and eye areas.(7) Age > 65 years with the most frequently encountered comorbidities, namely HT (21.1%), DM (9.7%), and heart disease (8.4%) with an incidence of admission to the Intensive Care Unit (ICU) of 72.2%.(8)

ETIOLOGY

SARS-CoV-2 shares similarities with bat coronaviruses, leading to the hypothesis that SARS-CoV-2 originated in bats and can infect humans. The coronaviruses that cause COVID-19 are genus B, with enveloped, spherical, and often pleomorphic viruses with a diameter of 60-140 nm. SARS-CoV-2 encodes 19 proteins, including four main structural proteins: spike (S), membrane (M), envelope (E), and nucleocapsid (N) (Figure 1). Envelope and helicase are genes used to detect SARS-CoV-2 in clinical laboratories. (9)

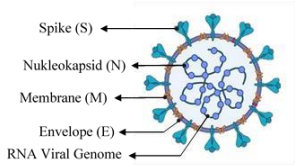

Figure 1. Structure of the Coronavirus
Source: (King, Kosinski-Collins, and Sunberg, 2022)

CLINICAL MANIFESTATIONS

COVID-19 is transmitted through inhalation or contact with droplets, with an incubation period of 2–14 days. The most common symptoms are cough, shortness of breath, headache, fatigue, and other nonspecific symptoms such as sore throat, nasal congestion, headache, diarrhea, nausea, and vomiting. In some cases, diarrhea and loss of taste have been reported as symptoms of COVID-19.

These symptoms can lead to pneumonia, acute respiratory disease (ARDS), and multi-organ failure. COVID-19 symptoms are divided into three categories: mild, moderate, and severe. (10) Diagnosis is also made in the laboratory using molecular testing. Generally, normal or decreased white blood cell counts with the presence of C-reactive protein (CRP) will be found. (11)

CONCLUSION

The results showed a relationship between the type and number of comorbidities and the incidence of COVID-19 patient deaths, with a p-value of 0.004 and a p-value of 0.003.

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