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Demography and Clinical Characteristic COVID-19 with Diabetes Mellitus at the Universitas Sumatera Utara Hospital

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ABSTRACT.

Background: COVID-19 is a disease caused by a virus called SARS-CoV-2. COVID-19 can infect almost all age groups, however, the elderly and those with co-morbidities such as diabetes mellitus can get worse complications from COVID-19. The study aims to find out the demographics and clinical characteristics of COVID-19 patients with diabetes mellitus treated at the Universitas Sumatera Utara Hospital.

Method. This research is a descriptive study using retrospective data. The data used is secondary data taken from medical records. The number of samples that met the inclusion criteria was 37 people.

Results. The majority of patients were dominated by the age group of 46-65 years (56.8%) and males (54.1%). The predominating clinical characteristics of COVID-19 with diabetes mellitus are cough (70.3%), shortness of breath (59.5%), and fever 51.4%. There was an increase in the laboratory results of COVID-19 patients with diabetes mellitus on blood sugar levels at admission, HbA1c, urea, creatinine, SGOT, SGPT, and d-dimer levels. The most treatment results were recovered by as many as 24 people (64.9%).

Conclusion. The majority of patients are in the age group of 46-65 years and are male. The most common clinical characteristic is cough and there is an increase in laboratory results in patients

Keywords: COVID-19, Diabetes Mellitus, Clinical Characteristics

ABSTRAK.

Latar Belakang: *COVID-19 adalah penyakit yang disebabkan oleh virus bernama SARS-CoV-2. COVID-19 dapat menginfeksi hampir seluruh golongan usia, meskipun demikian golongan usia lanjut dan memiliki komorbid seperti diabetes melitus dapat terkena komplikasi yang lebih buruk dari penyakit COVID-19. Tujuan. Untuk mengetahui demografi dan karaketeristik klinis pasien COVID-19 dengan diabetes melitus dirawat di RS Universitas Sumatera Utara.*

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Metode. *Penelitian ini merupakan penelitian deskriptif dengan menggunakan data retrospektif. Data yang digunakan merupakan data sekunder yang diambil dari rekam medis. Jumlah sampel yang memenuhi kriteria inklusi adalah 37 orang.*

Hasil. *Mayoritas pasien didominasi oleh kelompok usia 46-65 tahun (56,8%) dan jenis kelamin laki-laki (54,1%). Karakteristik klinis COVID-19 dengan diabetes melitus yang mendominasi adalah batuk(70,3%), sesak napas (59,5%), dan demam 51,4%. Terdapat peningkatan hasil laboratorium pasien COVID-19 dengan diabetes melitus pada kadar gula darah saat masuk rawatan, kadar HbA1c, urea, kreatin, SGOT, SGPT ,dan d-dimer. Hasil rawatan yang paling banyak adalah sembuh sebanyak 24 orang (64,9%). Kesimpulan. Mayoritas pasien adalah kelompok usia 46-65 tahun dan jenis kelamin laki-laki. Karakteristik klinis yang paling banyak dijumpai adalah batuk dan terdapat peningkatan nilai hasil laboratorium pada pasien*

Kata Kunci: *: COVID-19, Diabetes elitus, Karakteristik Klinis*

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1 Introduction

Coronaviruses are important human pathogens, and the study of their behavior spans nearly a century. At the end of 2019, a new coronavirus appeared in Wuhan, China, and spread throughout the world. In February 2020, the World Health Organization (WHO) designated COVID–19 as the name of the human disease caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), previously known as 2019-nCoV.[1]

The announcement of the global COVID-19 pandemic on March 11, 2020, shows that this virus has spread to large populations in various countries. On March 25 2020 it had spread to 175 countries with a transmission rate of 425,493 cases. China still occupies the highest position, namely 81,637 cases, but cases of recovery in China are also high namely 73,770 cases. Therefore, the incidence of COVID-19 in China is under control. On March 2, 2020, the first two cases were confirmed in Indonesia.[2] On June 2, 2022, there were 533,562,226 cases of COVID-19 worldwide, 6,315,772 people died and 504,498,295 people recovered. The highest ranking is occupied by the United States with 86,146,955 cases. For the Asian region, India ranks first with 43,165,738 cases and Indonesia ranks 7th with 6,005,341 cases.[3]

The disease COVID-19 is still relatively new has a fast disease course, and is very easy to spread, but most of its characteristics are still not understood. COVID-19 can strike almost all age groups, however, the data currently available suggests that the elderly and those with a history of chronic disease (comorbid) are at risk of being exposed more frequently and with worse complications from COVID-19 disease. Examples of chronic diseases in question include hypertension, diabetes mellitus, cardiovascular disease, and chronic lung disease.[4]

The relationship between diabetes mellitus and COVID-19 is two-way. On the one hand, diabetes mellitus increases the risk of SARS-CoV-2 infection and further exacerbates the clinical course of COVID-19, leading to increased severity and death. On the other hand, SARS-CoV-2 can directly attack the pancreas and induce acute insulin-dependent diabetes mellitus in previously

non-diabetic subjects due to reduced insulin secretion or worsened glycemic control in subjects with pre-existing diabetes mellitus.[5]

In the city of Medan as of June 1, 2020, 156 people were treated for COVID-19 cases, of which 86 people recovered and 24 people died. As of December 31, 2021, 918 COVID-19 patients had died, of which 47,176 people had recovered and 8 people were being treated. In the report as of July 4, 2022, there were 73,000 positive confirmations of COVID-19, of which 71,955 people recovered, 1019 people died, and 26 people underwent treatment.[6]

Based on the description above, this study aims to evaluate the demographics and clinical characteristics of COVID-19 patients with diabetes mellitus at the Rumah Sakit Universitas Sumatera Utara from June 2020 - December 2021.

2 Method

The design of this research is descriptive with a cross-sectional study method. The data taken is secondary data taken from medical records. In this study, we wanted to know the clinical characteristics of COVID-19 patients with diabetes mellitus at Rumah Sakit Universitas Sumatera Utara from June 2020 - December 2021. The sampling technique used was total sampling where the samples used in this study were all COVID-19 patients with Diabetes Mellitus.

3 Results

COVID-19 patients with diabetes mellitus based gender is dominated by men. The average age of COVID-19 patients with diabetes mellitus is 60.7 years. The predominant clinical symptom is cough. The most common comorbidity is hypertension. In COVID-19 patients with diabetes mellitus, the average laboratory results were found to be increased, namely blood sugar levels at admission, HbA1c, urea, creatine, SGOT, SGPT, and d-dimer levels. The most common degree of disease severity is moderate and the most treatment results are recovered. The results of the study show that 21 people (54.1%) are most affected by COVID-19 (Table 1).

Table 1 Baseline Characteristics

Variable	All Patients (n=37)
Gender, (%)	
Male	54,1
Female	45,9
Age, mean, years	60,7
Clinical symptoms, (%)	
Fever	51,4
Cough	70,3
Out of breath	59,5
Anorexia	18,9
Diarrhea	8,1
Comorbidities, (%)	
Hypertension	35,1
Dyslipidemia	5,3
COPD	1,8
Heart Disease	10,8
Chronic Kidney Disease	8,1
Tanpa Komorbid lain	13,5
Laboratory findings mean	
Haemoglobin, (g/dl)	13,29
Leucocyte, ($\mathbf{10^3}$/µL)	10,49
Platelets, ($\mathbf{10^3}$/µL)	285,7
Blood Sugar Level on Admission, (g/dl)	226,11
HbA1c, (%)	10,34
Urea, (mg/dl)	54,54
Creatinin, (mg/dl)	1,48
SGOT, (U/L)	195,5
SGPT, (U/L)	108,32
D-Dimer, (ng/dl)	1230,59
Degree of severity disease, (%)	
Mild	0
Moderate	43,2
Heavy	27
Critical	29,7
The outcome, (%)	
Recover	64,9
Died	35,1

4 Discussion

The results of this study are in line with research conducted in England which showed that males were most affected by COVID-19 with DM as many as 63 people (72.4%) and women as many as 24 people (27.6%).[7] A study conducted in Wuhan also showed the same results where the sex of men who had DM was affected by COVID-19 as many as 39 people (51.3%) followed by women as many as 37 people (48.7%).[8] In a study conducted in England, to be precise at William Harvey Hospital, most of the people who were treated were men. This shows that men with COVID-19 tend to experience severe symptoms more than women, and this difference is explained by the prevalence of smoking in men. males identified as contributors to disease severity.[7]

The average age of COVID-19 patients with diabetes mellitus is 60 years. These results are from research conducted in Wuhan which shows the average or mean age of COVID-19 sufferers with diabetes mellitus is 64 years.[9] Another study also showed an average age of 71 years conducted at the William Harvey Hospital, in England. This study also found an association between older patient age and a lower probability of survival. But in general, all age groups are susceptible to COVID-19, but patients who are older and have co-morbidities such as diabetes mellitus are more susceptible to more severe conditions.[7]

The most common clinical symptom was coughing for 26 people (70.3%). This study is not aligned with research conducted in Iran where the most common symptoms were fever in 103 people (69.6%) and dry cough in 97 people (65.5%).[10] For an explanation of why fever symptoms have not been explained theoretically in various research journals.

The most common comorbidities were hypertension in 13 people (35.1%), followed by heart disease in 4 people (10.8%), chronic kidney disease in 3 people (8.1%), dyslipidemia in 3 people (5, 3%), COPD 1 person (1.8%) and no other comorbidities (only DM) 5 people (13.5%). A study conducted in Wuhan, China, which examined 310 COVID-19 patients, 113 of whom had comorbid hypertension, revealed that COVID-19 patients with diabetes mellitus tended to show higher mortality. The specific pathogenesis of hypertension causing more severe COVID-19 remains to be studied, where cytokine imbalances may be considered as a link between hypertension and more severe COVID-19.[11]

Average or mean hemoglobin was 13.29 g/dl. This study is aligned with research conducted in Wuhan which showed an average or mean of hemoglobin of 13 g/dl. In a study conducted in Italy, it was shown that patients who entered treatment with confirmed COVID-19 had low hemoglobin concentrations and a high prevalence of anemia.[12]

The average or mean of leukocytes is $10.49.10^3/\mu L$. This study is not aligned with research conducted in Iran which showed an average leukocyte of $5.9.10^3/\mu L$[10]. Leukocytosis is found in some patients with COVID-19 which seems to indicate a bacterial infection or superinfection. A literature meta-analysis showed that leukocytosis was identified in 11.4% of patients with severe disease and 4.8% in mild to moderate disease.[13]

The average or mean of platelets in patients is $285.7.10^3/\mu L$. This study is in line with a study conducted in Kuwait where the mean platelet count in asymptomatic patients was $287.16.10^3/\mu L$, in patients with moderate degrees of 314.24. $10^3/\mu L$ and $274.61.10^3/\mu L$ in severe degrees[14]

5 Conclusion

Based on the characteristics of COVID-19 patients with diabetes mellitus, according to sex, there were 20 men (54.1%). Based on the characteristics of COVID-19 patients diagnosed with diabetes mellitus according to age, the highest number was found in the age range of 46-65 years as many

as 21 people (56.8%). Based on clinical symptoms, 26 people (70.3%) had coughs. Based on laboratory results obtained. The mean laboratory results that increased were blood sugar levels at admission, HbA1c, urea, creatine, SGOT, SGPT, and d-dimer levels. Based on comorbidity, 13 people (35.1%) had hypertension. Based on the severity of the disease, 16 people (43.2%) had a moderate degree. Based on the results of the treatment, 24 people (64.9%) recovered the most

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