

The Relationship Between Age and Clinical Manifestations and the Severity of COVID-19 in Bengkulu Province in 2020

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Abstract

The infectious disease COVID-19 caused by the SARS-CoV-2 virus can infect all age groups. Symptoms can vary from asymptomatic to severe and critical. Differences in clinical symptoms may occur due to differences in the distribution, maturation and function of the SARS-CoV-2 virus receptor. These clinical symptoms will determine the severity of COVID-19. This study aims to analyze the relationship between age and clinical symptoms and the severity of COVID-19 in Bengkulu Province in 2020. This study used an observational analytic study with a cross sectional design . Samples were taken using a consecutive sampling technique and obtained as many as 109 subjects who were COVID-19 patients in Bengkulu Province from March to December 2020. Assessment of clinical symptoms used the COVID-19 epidemiological investigation form. The degree of severity is determined based on the COVID-19 Prevention and Control Guidelines by the Ministry of Health of the Republic of Indonesia. The relationship between the two variables was analyzed using the Spearman Rank test. The results of this study indicate that there is a significant relationship between the age factor of COVID-19 patients in determining the severity of COVID-19 ($p = 0.000$; $p < 0.05$). Conclusion of this study suggests that age may be a risk factor associated with clinical symptoms and severity in COVID-19 patients. Although patients aged 0-18 years were lighter than those aged over 18 years.

Keywords: *Infection; Clinical Manifestation; Severity; Pandemic; COVID 19*

Abstrak

Penyakit menular COVID-19 yang disebabkan oleh virus SARS-CoV-2 dapat menyerang semua kelompok umur. Gejala dapat bervariasi dari asimtomatik hingga parah dan kritis. Perbedaan gejala klinis dapat terjadi karena perbedaan distribusi, maturasi dan fungsi reseptor virus SARS-CoV-2. Gejala klinis ini akan menentukan tingkat keparahan COVID-19. Penelitian ini bertujuan untuk menganalisis hubungan usia dan gejala klinis dengan derajat keparahan COVID-19 di Provinsi Bengkulu Tahun 2020. Penelitian ini menggunakan penelitian analitik observasional dengan desain cross sectional. Pengambilan sampel menggunakan teknik consecutive sampling dan didapatkan sebanyak 109 subjek yang merupakan pasien COVID-19 di Provinsi Bengkulu pada bulan Maret hingga Desember 2020. Penilaian gejala klinis menggunakan formulir investigasi epidemiologi COVID-19. Derajat keparahan ditentukan berdasarkan Pedoman Pencegahan dan Pengendalian COVID-19 oleh Kementerian Kesehatan Republik Indonesia. Hubungan antara kedua variabel dianalisis dengan menggunakan uji Spearman Rank. Hasil penelitian ini menunjukkan bahwa terdapat hubungan yang bermakna antara faktor usia pasien COVID-19 dalam menentukan derajat keparahan COVID-19 ($p=0,000$; $p<0,05$). Kesimpulan penelitian ini menunjukkan bahwa usia dapat menjadi faktor risiko yang terkait dengan gejala klinis dan tingkat keparahan pada pasien COVID-19. Meskipun pasien usia 0-18 tahun lebih ringan dibandingkan dengan usia di atas 18 tahun.

Kata kunci: *Infeksi; Manifestasi klinis; Kerasnya; Pandemi; COVID 19*

INTRODUCTION

The SARS-CoV 2 virus is a new type of virus from the Coronavirus belonging to the Coronaviridae family (Li et al., 2020a). The World Health Organization (WHO) declared this disease a pandemic in March 2020 and the SARS-CoV 2 infectious disease was named Coronavirus Disease 2019 (COVID-19) (Song et al., 2020). On March 1, 2020 the first case in Indonesia was reported and as of February 13, 2022, cases of COVID-19 in Indonesia had reached 404,910,528 confirmed cases of COVID-19 [3].

The infectious disease COVID-19 spreads very quickly throughout the world due to transmission of the virus through droplets, airborne, or through contaminated objects (Galbadage et al., 2020). Another theory states that transmission of COVID-19 can occur directly or indirectly (Lotfi et al., 2020). Direct contact occurs through droplets that can reach a distance of 6 feet or approximately 2 meters. The droplets can survive in the environment for up to 3 hours and stick to surrounding objects. Objects contaminated with these droplets can be a medium of transmission of COVID-19. Transmission of COVID-19 can also occur indirectly through aerosols even within a distance of more than 2 meters in the air. This is supported by the theory which states that droplets can survive in the air.

The SARS-CoV-2 virus can infect humans if the virus enters the body through the mouth, nose, or eyes. The SARS-CoV-2 virus that enters the human respiratory tract will attach to the Angiotensin Converting Enzyme 2 (ACE-2) receptor which is found in the epithelial cells of the trachea, bronchi, bronchioles and lungs (Hofmann et al., 2005a). After that, the virus that infects epithelial cells will attack the human immune system resulting in the uncontrolled production of proinflammatory cytokines. These events are called cytokine storms and can cause tissue damage (Li et al., 2020b). Differences in the distribution, maturation, and function of the SARS-CoV 2 virus receptor can affect the clinical symptoms that appear in COVID-19 patients (Hofmann et al., 2005b).

COVID-19 can infect all age groups and age is also one of the parameters determining the severity of COVID-19 (Zare-Zardini et al., 2020). Symptoms that arise in COVID-19 patients vary from asymptomatic to critical, in general this virus causes respiratory problems (Ali & Alharbi, 2020). Common symptoms of COVID-19 patients consist of fever, cough, dizziness, dry throat, fatigue, shortness of breath, and muscle weakness (Sun et al., 2020). Other symptoms such as gastrointestinal disturbances can also be experienced by COVID-19 patients (Li et al., 2020b).

The severity of COVID-19 can be determined based on clinical symptoms. The determination of the severity level used in Indonesia refers to the COVID-19 Prevention and Control Guidelines by the Ministry of Health of the Republic of Indonesia in 2020. These guidelines classify COVID-19 into five degrees, namely asymptomatic degrees, mild degrees of illness, moderate degrees of illness, severe degrees of illness, and degrees of illness. critical.

Table 1. Classification of Severity of COVID-19 (Ministry of Health RI, 2020)

Severity	Clinical Symptoms	Explanation
Asymptomatic (Asymptomatic)	No clinical symptoms	The patient does not show any symptoms
Minor Pain	Mild pain without complications	Patients with non-specific symptoms such as fever, cough, sore throat, nasal congestion, malaise, headache, muscle aches.
Moderate Pain	Mild pneumonia	Children with mild pneumonia have a cough or difficulty breathing with rapid breathing; respiratory rate: age <2 months 60 x/minute; age

		<p>2-11 months 50 x/minute; 1-5 years old 40 x/minute. Patients aged 6-17 years with clinical signs of pneumonia (fever, cough, dyspnea, rapid breathing) and no signs of severe pneumonia.</p> <p>In patients >18 years with clinical signs of fever, cough, rapid breathing, dyspnea without symptoms of severe pneumonia.</p>
Severe pain	Severe pneumonia	<p>Child with cough or difficulty breathing, plus at least one of the following criteria:</p> <ol style="list-style-type: none"> 1. Central cyanosis or SpO₂ < 90% 2. Severe respiratory distress such as snoring, heavy chest indrawing 3. Signs of severe pneumonia: inability to breastfeed or drink, lethargy, seizures 4. Tachypnea: age <2 years 60 x/min; age 2-11 months 50 x/minute; 1-5 years old 40 x/minute; >5 years old 30 x/minute. <p>Age 5-17 years with complaints of fever or under surveillance for respiratory infections, plus one of; respiratory rate >30 breaths/minute, severe respiratory <i>distress</i>, or oxygen saturation <90% at room temperature.</p> <p>Patients >18 years have symptoms of fever and are monitored for respiratory tract infections, respiratory rate >30 x/minute, severe respiratory distress, oxygen saturation <90 %.</p>
Critical Ill	Acute Respiratory Distress Syndrome (ARDS)	<p>Onset: new or worsening within one week.</p> <p>Chest imaging (thoracic CT scan or lung ultrasound): bilateral opacities, unexplained pleural effusion, lung collapse, lobe or nodule collapse.</p> <p>Causes of edema: respiratory failure that is not due to heart failure or fluid overload.</p>

METHOD

The study was conducted in Bengkulu Province with a retrospective research setting from March to December 2020. The research design was an observational study in the form of a cross-sectional study. The study population was patients with confirmed COVID-19 in 2020 and domiciled in Bengkulu Province. Determination of the sample was calculated using the Slovin formula and obtained a sample of 109 subjects, then the sample was taken by non-probability sampling using a consecutive sampling technique .

The research data was obtained from the COVID-19 Epidemiological Investigation Form which includes research variables in the form of age and clinical symptoms of COVID-19 patients. These clinical symptom variables will be interpreted in terms of the severity of COVID-19 based on the COVID-19 Prevention and Control Guidelines by the Indonesian Ministry of Health in 2020.

The data collected will be analyzed by univariate and bivariate. The results of the univariate analysis in the form of distribution and percentage of each variable studied. Bivariate analysis is intended to analyze the relationship between two research variables, namely the independent variable in the form of age and the dependent variable in the form of the severity of COVID-19. The test used in the bivariate analysis is the Spearman Rank correlation test with a 95% confidence level and 5% deviation degree. The results are significant if the p value <0.05 and not significant if the p value is 0.05. This research has conducted ethical

clearance with no. 189/UN30.14.9/LT/2020.

RESULT AND DISCUSION

Characteristics of Research Subjects

Table 1. Gender Distribution of Research Subjects

Gender	%	Subject (n)
Man	45.9%	50
Woman	54.1%	59

Based on table 1, more female subjects (54.1%) than male sex (45.9%). This is different from the results of a study conducted in the United States which stated that male subjects were more than female (Covid et al., 2020).

The proportion of male mortality is higher than female mortality, this is due to the habit of smoking and alcohol consumption in men (Vahidy et al., 2021). The WHO European Region also states that COVID-19 infection is more common in men than women (WHO, 2021).

Table 2. Age Distribution of Research Subjects

Age	%	Subyek (n)
0 – 18 Years	49.5%	54
>18 Years	50.5%	55

Based on table 2, most of the COVID-19 patients are >18 years old.

Table 3. Distribution of COVID-19 Clinical Symptoms on Research Subjec

Clinical Symptoms	%	Subject (n)	Early/ When Treated Symptom
Cough	18.1	20	Early Symptoms
Fever	16.2	18	Early Symptoms
Have a cold	18.1	20	Early Symptoms
Weak	10.8	12	Early Symptoms
Hard to breathe	13.2	14	Symptoms When Treated
Severe Respiratory Distress	2.5	3	Symptoms When Treated
Sore throat	6.4	7	Early Symptoms
Headache	2.5	3	Early Symptoms
Asymptomatic	19.6	21	Early Symptoms
Anosmia	1.5	2	Early Symptoms
Nauseous	0.5	1	Early Symptoms
Throw up	0.5	1	Early Symptoms

Based on table 3, most of the COVID-19 patients did not experience any symptoms (19.6%). The most common clinical symptoms felt by COVID-19 patients who were the subjects of this study were coughs (18.1%) and runny noses (18.1%). Demographic research conducted in Indonesia using the spatial-temporal method also showed that COVID-19 patients in Indonesia had the most clinical symptoms, namely cough and fever. Not all COVID-19 patients experience difficulty in breathing (Aisyah et al., 2020a).

The findings of demographic data by (Aisyah et al., 2020b) are in line with the profile of COVID-19

patients in other Southeast Asian countries. One of the spread of COVID-19 in Indonesia is thought to be due to transmission of people from infected areas such as Malaysia (Aisyah et al., 2020b). Complaints in the form of cough, runny nose, and fever are included in the classification of the severity of COVID-19 mild illness which is the most classification in this study (Fig. 3).

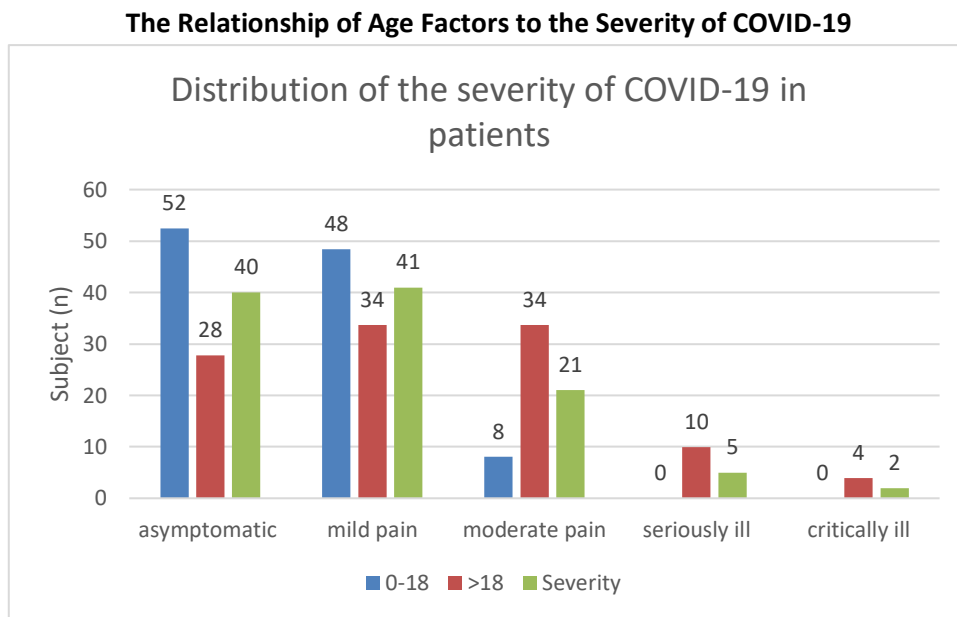


Figure 1. Distribution of the Severity of COVID-19

Figure 3. Shows the results of the severity of COVID-19 at the age of 0 - > 18 years, most of which are mild pain (38%) followed by asymptomatic disease severity (37%) and critical illness (19%).

This study obtained a result of $p = 0.000$, which means that there is a statistically significant relationship between the age of COVID-19 patients in determining the severity of COVID-19 ($p < 0.05$). Ages 0-18 years are easily infected with COVID-19 due to activities outside the home such as in schools and playgrounds, but in the diagnosis of COVID-19 based on clinical symptoms alone, it is very difficult at this age because ages 0-18 years predominantly experience the severity of COVID-19 19 are asymptomatic (Chai et al., 2021).

Based on previous research, it was also stated that COVID-19 patients with an age range of less than 20 years experienced a milder degree of COVID-19 severity than adult patients (Shoaib et al., 2021). It is possible for COVID-19 patients with an age range of >18 years to experience asymptomatic severity to mild illness. This can occur because of differences in the condition of a person's immunity. If the immunity is still good, the subject is classified as asymptomatic to mildly ill and vice versa (Bajaj et al., 2021). The same thing is also stated by (Manivannan et al., 2021a). Patients aged 0-18 years with asymptomatic severity to mild illness can be attributed to their condition with heterologic immune response mechanisms and higher memory T cell counts and higher levels of ACE-2 expression so as to prevent worsening (Manivannan et al., 2021b).

The limitation of this study is that the researchers did not analyze other factors that influence the severity of COVID-19 such as gender, habits, and comorbidities. Researchers also did not see laboratory results and radiological imaging results in COVID-19 patients. Researchers only saw the initial symptoms of patients infected with COVID-19 on the Epidemiological Investigation form and medical records.

CONCLUSION

This study illustrates that age can be a risk factor related to clinical symptoms and the severity of COVID-19 patients. Although patients aged 0-18 years have a milder degree of severity than patients aged >18 years, further research should be needed to analyze other factors that determine the susceptibility of COVID-19 patients with a certain age.

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