

Artikel

# The Correlation Between Adult Age Factors toward The Clinical Manifestation and The Severity Level of COVID-19 in Bengkulu Province in 2020

Begumratu VOCA<sup>1</sup>, Dia Triyani PUTRI<sup>1</sup>, Dessy TRIANA<sup>2</sup>, Riry AMBARSARIE<sup>3</sup>, Nikki Aldi MASSARDI<sup>4</sup>, and Utari Hartati SURYANI<sup>5\*</sup>

<sup>1</sup>Medical Study Program, Faculty of Medicine and Health Sciences, Universitas Bengkulu, WR. Supratman St., Kandang Limun, Bengkulu 38371

<sup>2</sup>Department of Parasitology, Faculty of Medicine and Health Sciences, Universitas Bengkulu, WR. Supratman St., Kandang Limun, Bengkulu 38371

<sup>3</sup>Medical Education Unit, Faculty of Medicine and Health Sciences, Universitas Bengkulu, WR. Supratman St., Kandang Limun, Bengkulu 38371

<sup>4</sup>Department of Pathology Anatomy, Faculty of Medicine and Health Sciences, Universitas Bengkulu, WR. Supratman St., Kandang Limun, Bengkulu 38371

<sup>5</sup>Department of Microbiology, Faculty of Medicine and Health Sciences, Universitas Bengkulu, WR. Supratman St., Kandang Limun, Bengkulu 38371

**Abstract:** Coronavirus Disease-19 (COVID-19) is an acute respiratory disease in Wuhan, China, and was discovered in 2019. The things that need to be considered in COVID-19 patients include their clinical manifestation and the severity level of COVID-19. The severity level of COVID-19 patients is associated with age. Each age has a different proportion of severity. The study aimed to determine the correlations among adult age with clinical manifestation and severity of COVID-19 in Bengkulu Province 2020. This study used an observational analytic study. The sample was 108 patients 19 - ≥65 years old and confirmed positive for COVID-19 in 2020. The assessment used the epidemiological investigation form and medical record from Dr. M.Yunus Hospital. At the same time, the severity level of COVID-19 was obtained from the measurement based on the COVID-19 Prevention and Control Guidelines by the Indonesian Ministry of Health. The results showed that the subjects in 19 – 23 years old mostly have asymptomatic severity, 24 – 64 years old mostly have mild severity, and ≥65 years old have moderate severity. It was concluded that there was a significant correlation between the severity of COVID-19 in Bengkulu Province in 2020.

**Keywords:** Coronavirus Disease-19; COVID-19; clinical manifestation.

## 1. Introduction

Coronavirus Disease-19 (COVID-19) or Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is an acute respiratory disease that first occurred in Wuhan, China, and was discovered in December 2019 [19]. COVID-19 was declared a pandemic by World Health Organization (WHO) in March 2020 [18]. The epidemiological data

announced by the Indonesian Ministry of Health stated that there were 1.306.141 positive cases and 35.254 death cases in February 2021. The data in Bengkulu Province reported 22.902 positive cases as of September 16, 2021 [5].

Age becomes an important factor in the spread of COVID-19, especially in young adults (19 – 23 years old), middle adults (24 – 64 years old), and late adults ( $\geq 65$  years old) [18]. This data is evident in the spread of COVID-19 in Bengkulu Province as of August 22, 2021, which recorded 19.299 positive cases from the young until middle adult group and 2.551 positive cases from a late adult group [5]. More than half of the COVID-19 patient population is dominated by adult patients because adulthood is a productive age for working, using public transportation. These hospital services allow the transmission of COVID-19 to occur very quickly [10].

According to research, age is one of the risk factors associated with the severity level of COVID-19. The group of patients aged  $<60$  years old showed a lower severity level than the group of patients aged  $\geq 60$  years old [8].

The clinical manifestations of COVID-19 are very diverse, ranging from asymptomatic, acute respiratory distress syndrome to multiorgan dysfunction. Common symptoms of COVID-19 include fever, cough, dizziness, dry throat, shortness of breath, tiredness, and muscle weakness [15, 16]. All those clinical manifestations are classified according to the severity level. The severity levels of COVID-19 are asymptomatic, mild, moderate, severe, to critical severity [3]. The late adult patient tends to have a complex condition, so COVID-19 is difficult to cure [7]. The study aimed to determine the correlations among adult age with clinical manifestation and severity of COVID-19 in Bengkulu Province on 2020.

## 2. Materials and Methods

This research used an observational analytic study with a cross-sectional design. The sample was 108 patients 19 -  $\geq 65$  years old and confirmed positive for COVID-19 in 2020. The assessment used the epidemiological investigation form and medical record from Dr. M.Yunus Hospital. At the same time, the severity level of COVID-19 was obtained from the measurement based on the COVID-19 Prevention and Control Guidelines by the Indonesian Ministry of Health.

## 3. Result and Discussion

### 2.1. Subjects Characteristic Overview

The study showed that the male gender (55,6%) was more prevalent than the female gender (44,4%); however, the comparison between both gender was minimal. WHO European Region also found that COVID-19 infection is more common in the male gender than female gender [18]. The proportion of male mortality is higher than females due to smoking habits and alcohol consumption. During hospitalization, male patients experienced severe shortness of breath and very low oxygen saturation [17].

The age group most infected by COVID-19 in this study was the middle adult group (86,1%), followed by the young adult group (8,3%) and the late adult group (5,6%). The epidemiological data of COVID-19 in Bengkulu Province in 2021 reported that the middle adult group was the age with the highest prevalence of COVID-19 from other age groups [5]. People in the young adult and middle adult group have low awareness of maintaining health protocols even though those groups are the most productive daily. They also have a higher level of ACE2 expression than people in late adult groups. Therefore ACE2 expression level becomes the reason for large transmission of COVID-19 in young adult and middle adult groups [1, 13].

**Tabel 1.** The Distribution of COVID-19 Clinical Manifestation.

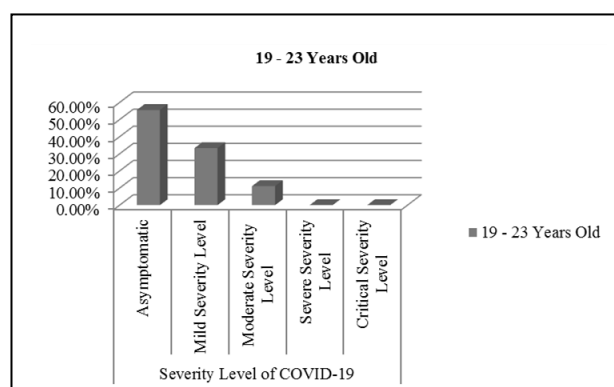
Clinical Manifestation	%
Cough	25
Fever	17
Flu	6
Muscle weakness	9
Shortness of breath	19
Severe respiratory distress	3
Sore throat	4
Dizziness	3
Anosmia	2
Ageusia	0
Asymptomatic	12

We also found cough (25%) as the most common clinical manifestation in our research subjects, followed by shortness of breath (19%) and fever (17%). We rarely found ageusia (0%) and anosmia (2%) as the clinical manifestations in our study (Table. 1). COVID-19 clinical manifestations in adults commonly lead to pneumonia, such as fever, cough, muscle weakness, and shortness of breath [6]. Other clinical manifestations, including nausea, vomiting, ageusia, and anosmia, are thought to occur due to the coronavirus route, which spreads neurally and hematogenous route [2].

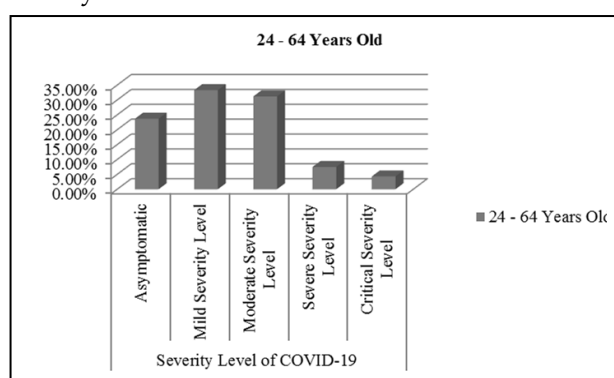
## **2.2. The Correlation between Adult Age Factor toward The Clinical Manifestation and The Severity Level of COVID-19**

The young adult group mostly has an asymptomatic severity level of COVID-19 (55,6%). In comparison, the middle adult group mostly has a mild severity level (33,3%), and the late adult group mostly has a moderate severity level (83,3%). Many factors could affect the severity level of COVID-19, one of which is age. An older person tends to have a faster aging process in the immune system against coronavirus. The number of alveolar macrophages increases with aging, but their plasticity to change pro-inflammatory into anti-

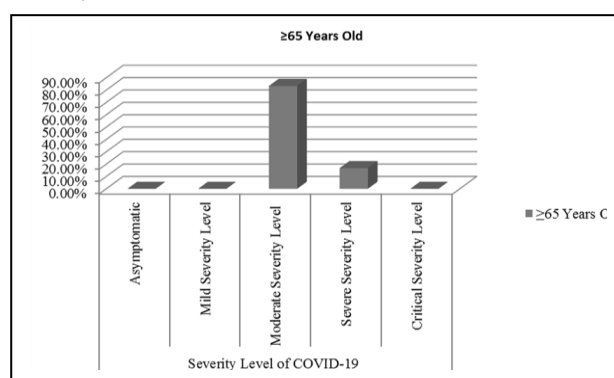
inflammatory is significantly reduced; for example, the cytokine response is getting weak while activating TLR. This weak plasticity could damage a patient's lung [11].



**Fig. 1.** Distribution of Severity Level of COVID-19 in 19 – 23 Years Old (Young Adult).



**Fig. 2.** Distribution of Severity Level of COVID-19 in 24 – 64 Years Old (Middle Adult).



**Fig. 3.** Distribution of Severity Level of COVID-19 in ≥65 Years Old (Late Adult).

Based on the results we presented, there was a correlation between the adult age factor and the severity level of COVID-19 in Bengkulu Province in 2020 with a weak correlation between variables ( $p= 0,001$ ,  $p <0,05$ , and  $r = 0,314$ ). This study also divides the correlation analysis into each age group. COVID-19 patients in young adult group had a significant correlation with the severity level of COVID-19 ( $p = 0,016$ ,  $p <0,05$ ). No severe and critical severity level was found in 19 – 23 years old (young adult). This result is consistent with the theory in which COVID-19 patients categorized as young adults tend to experience

asymptomatic to mild severity of COVID-19. The exact mechanism remains unknown, but several possibilities are related to heterologous immune responses, a higher number of T cells memory, and a higher number of ACE2 expressions that can prevent worsening of severity [9, 14].

Adult patients in the age of  $\geq 65$  years old or we categorize them as a late adult group also had a significant correlation toward COVID-19 severity level ( $p = 0,018$ ,  $p < 0,05$ ). At this age group, the most severity level is moderate severity; however, moderate severity includes shortness of breath and other symptoms found in mild pneumonia [4]. Cytokine storm syndrome as an immune defect plays the role of causing shortness of breath [11]. This study did not find asymptomatic and mild severity levels; it might be caused by the aging process [12].

We compare the middle adult group (24 – 64 years old) to young adult and late adult groups. There was no significant correlation between the middle adult group factor toward the severity level of COVID-19 ( $p = 0,714$ ,  $p > 0,05$ ) because the distribution of severity level in the middle adult group was found across all classifications had no specific severity level. According to the previous study, people in a middle adult group have a diversity of immune stability [1]. When their immunity is still good and does not have a defect, the subject's condition could be classified into asymptomatic and mild severity levels. Otherwise, if their immunity is not good and they have poor habits, the subject's condition will be classified as moderate until critical severity level. So it can be said that subjects under 65 years old still have a good immune response [1].

#### 4. Conclusion

There is a significant correlation between the adult age factor toward the clinical manifestation and the severity level of COVID-19, even though it has a weak correlation between variables. Weak correlation caused by a certain age of 24 – 64 years old or the so-called middle adult does not have any specific severity level due to different conditions of immunity in each patient.

Based on this study, it is necessary to analyze the correlation between other factors that affect the clinical manifestation and the severity level of COVID-19.

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