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Original Article

A correlation study of the rapid diagnostic test antibody with the initial scoring system for suspect COVID-19 at Mamami Hospital, Kupang City, East Nusa Tenggara, Indonesia

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ABSTRACT

The SARS-CoV-2 virus is a Coronavirus, a new type that causes an epidemic, first reported in Wuhan China on December 31, 2019. In early April, cases of the Coronavirus Disease 2019 (Covid-19) were first reported at East Nusa Tenggara, Kupang. The main clinical symptoms that appear are fever (temperature >38°C), cough, and difficulty breathing. In addition, it can be accompanied by severe shortness of breath, fatigue, myalgia, and gastrointestinal symptoms such as diarrhea and other respiratory symptoms. Patients who got administered to the COVID-19 emergency room will be screened for rapid screening which covers the patient's symptoms and travel history. Subsequently, an initial scoring system is carried out to determine whether this patient's condition is mild, moderate, or severe. Based on this scoring system, then a further examination is carried out in the form of a rapid test (antibody). In accordance with the scoring, if the score is light, patient management is carried out in accordance with the services. If the patient has a moderate during the initial scoring system, then the RDT-Antibody examination is carried out in accordance with the consultation with the doctors in charge or according to the patient's supporting indication. If the patient has respiratory symptoms and the RDT (antibody) showed reactive result, subsequently will be put in a designated isolation room to be immediately prepared for a swab examination as well as further management. The design of this research is an observational descriptive study using a cross-sectional design. This study will take place at Mamami Hospital, Kupang City, East Nusa Tenggara, Indonesia, from June to October 2020. The population in this study was all patients who came for treatment with symptoms or without symptoms of Covid-19 in Mamami Hospital with total of 30 subjects. The COVID-19 RDT (Antibody) was carried out on the 30 respondents based on the previous scoring shown in Table 1 with the results that all of the 30 respondents got non-reactive RDT results. Indeed, in all respondents with severe scoring system all produced non-reactive RDT (Antibody) test. In addition, we also performed a re-screening, but the RDT (Antibody) results were still non-reactive. There is no significant correlation between the COVID-19 screening scoring system with the Rapid Diagnostic Testing (Antibody) examination at Mamami Hospital, Kupang Regency, East Nusa Tenggara.

Keywords: Antibody, COVID-19, initial scoring system, RDT

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INTRODUCTION

Coronavirus is a non-segmented, enveloped, and positive sense RNA virus that originates from the Coronaviridae family and the ordo Nidovirales. It is widely distributed in humans and other mammals. Although most coronavirus infections tend to be mild, the epidemics of the two previous beta-coronaviruses, SARS-CoV, and MERS-CoV, have caused more than 10,000 cumulative cases in the past two decades, with a mortality rate of 10% in SARS-CoV cases and 37% in MERS-cases. In December 2019, a case of pneumonia virus that attacks the lower respiratory tract was found in China, in the city of Wuhan Huebei which caused by the 2019-nCov or what is now known as SARS-nCOV2. This has affected not only developed countries, developing countries, and even underdeveloped countries by the SARS-nCOV2 virus. Indeed, the virus has even caused more than 5.92 million victims

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Table 1: The relationship between rapid screening scoring and the results of the COVID-19 rapid test (antibody)

	Result (%)	
	Reactive	Non-reactive
Mild scoring	0	3 (10)
Moderate scoaring	0	17 (56.6)
Severe scoring	0	10 (33.3)
Total		30 (100)

worldwide. There is no established antiviral and vaccine against this virus.[1-3]

Coronaviruses can only reproduce through their host cells. Viruses cannot live without host cells. The following is the cycle of the Coronavirus after finding host cells according to their tropism. First, the attachment and entry of the virus to the host cell is mediated by Protein S on the surface of the virus.[4] Protein S is the main determinant in infecting its host species and its tropical determinants.[5] After successful entry, the replication of gene translation from viral genomic RNA. Furthermore, replication and transcription are the synthesis of RNA viruses through translation and assembly of the viral replication complex. The next stage is the assembly and release of the virus.[6] After transmission, the virus enters the upper airway and then replicates in upper airway epithelial cells (carrying out its life cycle). After that, it spreads to the lower airway. In acute infection, the virus sheds from the airway and the virus can continue to shed for some time in the gastrointestinal cells after healing. The incubation period of the virus the disease emerges is about 3–7 days.[4-7]

Indonesia as a developing country also did not escape this SARS-nCOV2 virus attack. Since the beginning of March 2020, Indonesia has been hit by the corona virus, which started from Jakarta as the capital. The total number of cases of COVID-19 patients in Indonesia is currently 25,216 where 6492 of them have been declared cured (25.75%) and 1520 people have died (6.03%), while the rest are still undergoing treatment. In early April 2020, COVID-19 cases began to enter East Nusa Tenggara, Kupang. To date, more than 100 cases have been found in East Nusa Tenggara that have tested positive for the corona virus.[2,7,8]

Patients who got administered to the COVID-19 emergency room will be screened for rapid screening which covers the patient's symptoms and travel history. Subsequently, an initial scoring system is carried out to determine whether this patient's condition is mild, moderate, or severe. Based on this scoring system, then a further examination is carried out in the form of a rapid test (antibody). In accordance with the scoring, if the score is light, patient management is carried out in accordance with the services. If the patient has a moderate during the initial scoring system, then the RDT-Antibody examination is carried out in accordance with the consultation with the doctors in charge or according to the patient's supporting indication. If the patient has respiratory symptoms and the RDT (antibody) showed reactive result, subsequently will be put in a designated isolation room to be immediately prepared for a swab examination as well as further management.[9-11]

METHODS

The design of this research is an observational descriptive study using a cross-sectional design. This study will take place at Mamami Hospital, Kupang City, East Nusa Tenggara, Indonesia, from June to October 2020. The population in this study was all patients who came for treatment with symptoms or without symptoms of COVID-19 in Mamami Hospital with total of 30 subjects. The research has informed consent from the patients who met the inclusion criteria and would become respondents. Data acquired in this study were achieved from the screening sheet, scoring, and results of the patient's RDT (Antibody) in the patient's medical record at the Mamami hospital. All data that have been collected are processed and analyzed and reported as the results of the study.

Data collection was carried out by making observations and direct interviews with subjects using data collection instruments. The study used primary data, namely, interviews using forms that were initially filled in the form of screening and scoring. If the scoring is moderate to severe, an RDT is performed. If the RDT (Antibody) is positive, a further swab examination is carried out. If negative, then only do the management according to the patient's indication. This positive or negative result will be associated whether there is a relationship with the scoring result.

RESULTS AND DISCUSSION

This research was conducted by sorting out the characteristics of the respondents. Table 2 showed that the number of male respondents is eight people or 26% of all respondents, female respondents were19 people or 63% of all respondents, and children respondents were three people or 10% of the total respondents. With the age range of male respondents ranging from the age of 26 years–85 years, while female respondents ranging from the age of 21 years to 62 years, and the respondents were children aged 8 months–10 years.

Furthermore, the following is an analysis carried out to see the description of the distribution of patients with mild, moderate,

and severe scoring system in the study respondents who were patients at Mamami Hospital, Kupang from July to October 2020 [Table 3].

Based on the correlation between the scoring system and the screening by separating the sexes, it was found that male respondents had a mild scoring of three people with a percentage of 10%, moderate scoring three people with a percentage of 10%, and a heavy score of 0. In the female gender, it was obtained a mild score of 0, moderate scoring 11 people or 36.6%, and severe scoring ten people or 33.3%. Whereas for children with mild scouring 0, moderate scoring was 3 or 10%, while severe scoring was 0.

The COVID-19 Rapid Test (RDT) (Antibody) was carried out on the 30 respondents based on the previous scoring shown in Table 1 with the results that all of the 30 respondents got non-reactive RDT results. Indeed, in all respondents with severe scoring system all produced non-reactive RDT (Antibody) test. In addition, we also performed a re-screening, but the RDT (Antibody) results were still non-reactive. Some patients with complaints of respiratory tract or shortness of breath, or had close contact with patients with positive swab results, thus scored severe in the scoring system, UT in the RDT showed non-reactive. Therefore, all of the 30 respondents who were examined and scored and the re-scored for the second time, showed non-reactive RDT (Antibody).

The results of this study, it can be observed that local transmission had occurred and with various symptoms and without symptoms. Even with a high scoring value, it is not certain that you will get a positive COVID-19 result or a reactive result on the RDT (Antibody). The RDT (Antibody) examination does not guarantee that a patient is positive for COVID-19, so it is necessary to follow the patient's clinical course and carry out a further swab examination if a patient is found with a reactive result. In addition, it is necessary to increase immunity, keep wearing masks, keep your distance, wash your hands, and avoid crowda so that we avoid patients who are without symptoms or asymptomatic.

Table 2: Characteristics of respondents

Variable	Frequency *n*=30	Percentage
Gender/age		
Male (26–85th)	8 people	26
Female (21–62th)	19 people	63
Children (8 bln–10th)	3 people	10

Table 3: Relationship of the screening scoring with gender

	Male (%)	Female (%)	Children (%)	Total
Mild scoring	3 (10)	0	0	3
Moderate scoring	3 (10)	11 (36.6)	3 (10)	17
Severe scoring	0	10 (33.3)	0	10
Total				30

CONCLUSION

There is no significant correlation between the COVID-19 initial scoring system with the Rapid Diagnostic Testing (Antibody) examination at Mamami Hospital, Kupang Regency, East Nusa Tenggara.

ACKNOWLEGMENTS

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CONFLICT OF INTERESTS

There is no conflict of interests found during this study

Ethics

This study has received ethical approval from the Health Research Ethics Commission of the Faculty of Medicine, University of Nusa Cendana.

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