

THE 5th INTERNATIONAL CONFERENCE ON HEALTH POLYTECHNICS OF
SURABAYA (ICOHPS)
2nd *International Conference of Medical Laboratory Technology (ICoMLT)*

**THE USE OF SPUTUM SAMPLES IN DETECTION OF SEVERE
ACUTE RESPIRATORY SYNDROME CORONAVIRUS 2**

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ABSTRACT

The COVID-19 pandemic helps people with Tuberculosis (Tb) to be minimized as a source of pulmonary TB transmission, but does not rule out the possibility of them contracting COVID-19. Examination of Mycobacterium tuberculosis (M.Tb) through sputum through the Ziehl Neelsen (ZN) examination which is mandatory for patients during the treatment period of 2 months, 5 months and the end of treatment, can be used as time for detecting the presence of severe acute respiratory syndrome coronavirus 2 (SARS-Cov2).

The purpose of this study was to detect the presence of SARS-CoV2 in pulmonary tuberculosis patients in Manado City through the Antigen-Rapid Detection Test (Ag-RDT) using a sputum sample. 100 respondents were taken from the population of TB sufferers in 9 health centers with the highest TB burden in Manado City.

The results obtained that 3% of the respondents were reactive to the SARS-Cov2 antigen. The conclusion is that the SARS-Cov2 Rapid Antigen examination method using sputum samples when the patient performs the ZN examination obligation can be an alternative for early detection of COVID-19. It is recommended to follow up with a real time reverse transcription quantification polymerase chain reaction (RT-PCR) examination for TB patients after the results are reactive to the SARS-Cov2 antigen.

Keywords: Sputum of TB Patients, Rapid Antigen SARS-Cov2

BACKGROUND (Uppercase Bold, 12 pts)

Tuberculosis (TB) is an infectious disease caused by Mycobacterium tuberculosis. The majority of TB infections occur through the air, namely the inhalation of droplets containing germs from an infected person. People infected with Mycobacterium tuberculosis have a 10% risk of developing pulmonary TB. People with compromised immune systems, such as people living with HIV, people with TB, malnutrition, diabetes or people who use tobacco, are at higher risk of getting sick (Visca et al., 2021)

WHO estimates that there are 10.4 million new TB cases worldwide, of which 5.9 million (56%) are men, 3.5 million (34%) are women and 1.0 million (10%) are children. According to the 2021 Global Tuberculosis Report (WHO, 2022), Indonesia occupies the second position with the highest TB burden in the world after India. It is estimated that 1.3 million deaths from pulmonary TB

According to data from the Regional Health Office of North Sulawesi Province (Kemenkes RI, 2021), the CNR (Case Notification Rate) per 100,000 population of pulmonary TB in 2016 was 217 cases, increased in 2017 by 250 cases and in 2018 increased by 273 cases. Pulmonary TB is one of the fourth highest diseases in North Sulawesi Province. There are 15 regencies/cities in North Sulawesi Province, in 2018 Manado City ranked first with 2,052 cases of pulmonary TB, then Bitung City ranked second with 563 cases, and Tomohon City

ranked third with 353 cases. Of the 16 health centers in Manado City, there are 9 health centers with a high TB burden.

The World Health Organization (WHO) reported that as of July 18, 2021, globally, there were 190,597,409 confirmed cases of Covid-19, including 4,093,145 deaths (Faurin, 2021), and cases in 2022 would increase again when tests decreased (Azanella, 2022). Coronavirus Disease 2019 (Covid-19) is an infectious disease caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-Cov-2). Tuberculosis (TB) patients infected with SARS-CoV-2 can give a poor clinical picture, especially if there are interruptions during TB treatment. Symptoms can be felt more severe if there has been damage to lung structure and function caused by previous TB (Malik et al., 2020).

Tuberculosis (TB) is still a burden of health problems in Indonesia today. At the same time, Indonesia is also facing an outbreak of the corona virus (Covid-19) and TB patients must be more vigilant. These two diseases are respiratory pandemics that are transmitted through droplets, affecting a wide age range such as the elderly and people with special health conditions such as those with chronic lung disorders, even in children. Some of the symptoms of TB such as cough, fever, and feeling weak are also experienced by COVID-19 patients, thus making us aware of how vulnerable they are if TB patients do not seek treatment, because their immune system and lung conditions are also more susceptible to infection.

RESEARCH METHODS

The method used in this study is a true experiment, on the basis of sputum examination which is carried out again at 2 months 5 months and the end of treatment.

The population of 9 Public Health Centers in Manado City which has a high TB burden, attracted 100 respondents from the sputum examination schedule from January to April 2022. Sputum collection was carried out by visiting the respondent's home. Sputum samples were carried out as well as screening for COVID-19 using a rapid test antigen examination.

The data obtained are presented in tabular form and analyzed descriptively.

RESULTS AND DISCUSSION

The results obtained according to the age characteristics of the respondents can be seen in table 1.

Table 1 Distribution of Respondents by Age

Age	Frequency	Percentage
>65	6	6%
56-65	27	27%
46-55	22	22%
36-45	12	12%
<35	33	33%
Total	100	100%

The results obtained according to the educational characteristics of the respondents can be seen in table 2.

Table 2 Distribution of Respondents Based on Last Education

Last Education	Frequency	Percentage
SD	11	11%
Junior High School	58	58%
Senior High School	24	24%
College	7	7%
Total	100	100%

The results obtained according to the occupation characteristics of the respondents can be seen in table 3.

Table 3 Distribution of Respondents by Occupation

Work	Frequency	Percentage
Civil Servant	3	3%
Self-employed	37	37%
Student	1	1%
Housewife	21	21%
Laborer	38	38%
Total	100	100%

The results obtained according to the results of rapid antigen examination from sputum samples can be seen in table 4.

Table 4 Distribution of Respondents Based on Rapid Antigen Examination Results

Rapid Antigen	Frequency	Percentage
Reactive	3	3%
Non Reactive	97	97%
Total	100	100%

CONCLUSION AND RECOMMENDATION

Rapid antigen examination can be done using a sputum sample. It is recommended for TB officers at the Puskesmas when carrying out routine examinations of AFB sputum so that they can screen for COVID-19 on TB patients with the sputum sample.

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