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Analysis of Latent Tuberculosis Disease in Health Workers at the Rowosari Health Center Semarang

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Abstract

Background The prevalence of pulmonary TB with bacteriological confirmationwas 759 (95% CI589-961) per 100,000 population aged 15 years and over. Health workers who work in the pulmonary section of the hospital are very susceptible to exposure to Mycobacterium tuberculosis, because every day there is a relationship/contact dialogue (anamnesis) with active tuberculosis suffererswho are being treated. The purpose of this study was to determine the prevalenceof latent TB in health workers using the IGRA method Descriptive research method with samples were all health workers in the pulmonary sectionof rowosari health center consisting of 2 doctors, 2 analysts and 6 nurses, especially those who had worked for more than 5 years had their blood taken forexamination of interferon gamma antibodies using the IGRA method. Results From 10 successfully examined sample, 70% of the health workers that has contact with the patients has positive interferon gamma antibody. Conclusion Prolonged contact with Tuberculosis patient raises the probability of contagion,whereas decent immunity allows the health workers to proceed without any symptoms. An excellent administrative governance is required to reduce the occurrence of latent tuberculosis.

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1. INTRODUCTION

Based on data from the Health Service, the incidence of tuberculosis in Indonesia is high, ranking second in the world (since 2015). Various government programs carried out to reduce incidents have not been optimally successful. TB control efforts. It has been implemented with the DOTS (Directly Observed Treatment Short course) strategy until 2005 and the Stop TB strategy from 2006, but TB is still one of the most important health problems in the world (Ministry of Health of the Republic of Indonesia, 2015).

In 2013, it was estimated that there were 9 million TB cases and 1.5 million deaths. Indonesia is the country with the highest tuberculosis burden in Southeast Asia. Based on the 2012 WHO report, Southeast Asia is the largest contributor to new sufferers (40%) with a prevalence of 5 million and an incidence of 3.5 million. (WHO, 2014) Factors causing the high number of tuberculosis cases in Indonesia can be caused by patients' non-compliance with taking medication, increased cases of immunodeficiency disease, malnutrition, multidrug resistant tuberculosis (MDR-TB) and the presence of latent tuberculosis infection (LTBI). (Pulungan and Permatasari, 2021). Deaths due to tuberculosis in Indonesia show that the number is increasing from year to year, therefore it is necessary to control tuberculosis more optimally, including finding cases as early as possible, adequate

treatment and vaccination. (Maharani, et, all, 2021). The prevalence of pulmonary TB with bacteriological confirmation was 759 (95% CI 589-961) per 100,000 residents aged 15 years and over. (Nurhakim, et, all, 2020).

The prevalence of pulmonary TB with bacteriological confirmation by region is Sumatra 913, Java-Bali 593, and other regions 842 per 100,000 population aged 15 years and over. The prevalence of pulmonary TB with a positive smear was 257 (95% CI 210-303) per 100,000 population aged 15 years and over. The prevalence of positive smear pulmonary TB by region is Sumatra 307, Java-Bali 217, and other regions 260 per 100,000 population aged 15 years and over. The prevalence of pulmonary TB is high throughout Indonesia and in all age groups. The male group had a higher TB prevalence than women, namely 1083 (95% CI 872-1337) in men compared to 461 (95% CI 353-591) in women. Currently there are 1,600,000 people with all types of TB, showing that the TB burden is still high in Indonesia. (Indonesian Ministry of Health, 2015).

The bacteria that cause pulmonary tuberculosis are very easily transmitted, especially through indirect contact, splashing the patient's saliva into the surrounding environment. (R. wow, 2014). Health workers who work in the pulmonary department of hospitals are very vulnerable to exposure to Mycobacterium tuberculosis germs, because every day they always have dialogue (anamnesis) contact with active tuberculosis sufferers who are undergoing treatment. As community service officers, nurses who work in the pulmonary department are very vulnerable to contracting tuberculosis from patients. Nurses in the pulmonary department or pulmonary inpatient room must monitor the progress of the patient's health every day. (Surjanto, 2012). Good in monitoring medication taking, complete patient status, sharing and explaining how to take medication, even though you are using PPE (personal protective equipment), masks and gloves. Transmission that occurs from contact with these patients often goes undetected, what is the prevalence rate in hospitals, especially if the health workers who are exposed have good stamina. As a result, they are not alert when they are infected and only realize it when their stamina decreases or when they retire because their body condition declines due to age. It is necessary to think about what can be done to prevent or reduce it (Heru, 2016).

2. METHOD

Descriptive research was conducted at a private hospital in the city of Surabaya, using blood samples from staff at the hospital's pulmonary clinic. Respondents were health workers who worked in polyclinics, namely 10 respondents and two samples as negative controls. Respondents consisted of 2 doctors, 2 analysts and 6 nurses, especially those who had worked for more than 5 years. Then the presence of interferon gamma antibodies was seen using the Interferon Gamma Release Assay (IGRA) method. (Lopez, 2013).

IGRA is an examination to detect the presence of antibodies (immune response) against Mycobacterium tuberculosis. The blood samples taken are sent to the laboratory for examination using the IGRA method. IGRA can be used as a substitute for the Mantoux test, the reagent of which is now increasingly difficult to obtain on the market. Establishing a diagnosis of latent tuberculosis with the IGRA method is more specific, compared to the Mantoux test which can cross-react with another Mycobacterium. (Hermayanti, 2014).

3. RESEARCH RESULT

There were 10 respondents (health workers) who took part in the research (according to the inclusion criteria) (Table 1). Two samples as negative controls. The results of the IGRA examination of 10 health worker research respondents showed that 70% were positive for IGRA (LTBI/Latent tuberculosis infection), namely in health workers who were

exposed to tuberculosis sufferers every day. Especially health workers who work in infection areas. Exposure to tuberculosis patients by health workers, during anamnesis, when explaining the use of anti-tuberculosis drugs, officers when making sputum preparations for tuberculosis sufferers, during patient visits, when providing counseling, without any barriers between officers and tuberculosis patients. As many as 30% produced negative IGRA, in health workers whose work was not directly exposed to or in contact with tuberculosis sufferers or were not in areas of infection. (Hermayanti, 2014).

4. DISCUSSION

The daily life of a person with LTBI (Latent tuberculosis infection) looks healthy, can carry out activities as usual, it is highly recommended to maintain their immune system, because they have been sensitized or susceptible to Mycobacterium tuberculosis. Stress factors, fatigue, can trigger a decrease in the body's immune system, making it easier for tuberculosis-like symptoms (flu-like syndrome) to appear, such as shorter breathing, repeated coughing or remission. It is hoped that a person with LTBI will not be accompanied by other chronic diseases that can cause secondary infections, increasing the stimulus for activation of other pro-inflammatory cytokines. (Soto, et, all, 2015)

Generally, someone with LTBI can carry out their activities well. Diagnosis of latent TB has always been with a tuberculin skin test (tuberculin skin test or TST) which uses purified protein derivative (PPD). This test is less specific because there is a cross reaction with other mycobacterium antigens and Bacillus Calmette-Guerin (BCG) vaccination so it can give false positive results. The longer the time health workers work in the area of infection, the greater the induration of the Mantoux test results, but it is not specific (Murad, 2013).

Gamma interferon is a type of pro-inflammatory cytokine produced by macrophages or phagocyte cells of the innate immune system which are activated due to the binding of tuberculosis antigens to phagocyte cells. A more specific latent tuberculosis diagnosis detection examination, with the new method IGRA (Interferon Gamma Release Assay) can be an alternative choice, because it is more accurate (Corbiere, 2012).

Table 1: AGRA examination of respondents

No	Respondent	AGRA Examination Results
1	Administration	Negative
2	Registration	Negative
3	Sec. Cleanliness	Negative
4	Midwife	Positive
5	General Nurse	Positive
6	Dentist	Positive
7	General practitioners	Positive

Respondent's AGRA examination results

The positive IGRA results in 70% of health workers indicate that even though they are using personal protective equipment, transmission can occur. In order to reduce transmission rates or prevent transmission, other alternatives need to be considered, such as engineering techniques in treatment rooms and administratively. Technical engineering can be done by creating ventilation or installing a hood in such a way that air flows smoothly in the treatment room and sunlight penetrates into the room. Administratively you can add a face shield or face protector to reduce splashes, reducing contact time by speeding up the

mass duty cycle from 8 hours per day to 6 hours per day, limiting the age of health workers on duty in the lung room, carrying out routine health tests so that latent TB cases can be found as early as possible. it is possible and certainly to treat latent TB cases completely. Apart from this, additional nutrition can be provided to maintain the stamina of health workers working in the lung room. (Pollock, 2013).

Management of Latent Tuberculosis The effectiveness of screening and prophylactic management of latent tuberculosis using Isoniazid has an estimated reduction in the risk of developing active tuberculosis from International Union Against Tuberculosis and Lung Disease (IUATLD) data of up to 77%. Latent tuberculosis with isoniazid prophylaxis within a monitoring period of one-year post-prophylaxis is considered quite effective in preventing progression to active tuberculosis. Prophylactic management of INH or Isoniazid is indicated for health workers with positive IGRA examination detection, people with immunodeficiency conditions (stress, diabetes, chronic hypertension, hepatitis B, HIV and other chronic diseases), babies born to mothers with tuberculosis and in household contact with tuberculosis sufferers. active (still negative, but living in the same house as an active tuberculosis sufferer). (Aditama, 2013).\

5. CONCLUSION

The results obtained were that 70% of health workers working in the area of pulmonary infections (inpatient/outpatient) were diagnosed with latent tuberculosis, this indicates that the transmission of tuberculosis to health workers needs attention in eradicating tuberculosis. It is necessary to think about alternatives to prevent transmission apart from using personal protective equipment, including using other prevention methods such as changing the design of the treatment room and regular health checks. (Pollock, 2013).

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