

Research Report

FACTOR RELATED TO ANTI-TUBERCULOSIS DRUG RESISTENCY ON PULMONARY TUBERCULOSIS PATIENTS IN LABUANG BAJI HOSPITAL MAKASSAR

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ABSTRACT

Tuberculosis become crucial diseases in the world. The disease can spread rapidly since it spreads through the air. The transmission through coughing and sneezing from droplet TB Patients. Containing Mycobacterium tuberculosis can be exposed to anyone who is around the patient. The aim of this research is to analyze the factors that affect the anti-tuberculosis drug resistance in patients with pulmonary tuberculosis in Labuang Baji Hospital Makassar. The research design is cross sectional approach. This study is conducted in June–July 2017 with a total sample of 60 respondents. Based on the data analysis, it is found that there were 34 respondents (56.7%) from 15–34 years old group and 26 respondents (43.3%) from 35–54 years old group. There were 35 female respondents (58.3%) and 25 male respondent (41.7%), is respondents with positive VCT test result and 45 respondensts (74.0%) with negatif VCT test, 54 respondents (90,0%) who have treatment history previously, 45 respondents (78.3%) have history with TB contact, 45 respondents (75.6%) who had good knowledge. 51 respondents (95%) with anti tuberculosis drug resistance. The result of statistical test using Chi-Square test is showed that there was a significant correlation between treatment history and anti tuberculosis drug resistance with $p = 0.024 < \alpha = 0.05$. But, there was no relationship between sex and knowledge with anti-tuberculosis drug resistance with p value 0.56 and 0.566 (p value $> \alpha = 0.05$). It is recommended to health worker to give health education for patient and their family, so they can do their treatment until the patients are cured. It can prevent the patient to be anti tuberculosis drug resistance patient.

Keywords: Tuberculosis, anti-tuberculosis drug resistance, treatment history, sex, knowledge

ABSTRAK

Tuberkulosis adalah salah satu penyakit menular yang membahayakan kesehatan. Penyakit ini dapat menyebar dengan cepat karena menyebar melalui udara yang terjadi saat penderita tuberkulosis batuk dan bersin sehingga droplet yang mengandung Mycobacterium tuberculosis dapat terpapar pada siapapun yang berada di sekitar penderita. Tujuan umum dari penelitian ini adalah untuk menganalisis faktor-faktor yang memengaruhi resistensi obat anti tuberkulosis pada pasien tuberkulosis paru di Rumah Sakit Labuang Baji Makassar. Desain penelitian dengan pendekatan cross sectional. Penelitian ini dilakukan pada bulan Juni–Juli 2017. Dengan total sampel sebanyak 60 responden berdasarkan kriteria inklusi dan eksklusi. Berdasarkan analisis data, ditemukan bahwa kelompok usia 15–34 tahun sebanyak 34 responden (56,7%) dan 35–54 tahun sebanyak 26 responden (43,3%), Jenis Kelamin sebanyak 35 responden (58,3%) perempuan dan 25 responden (41,7%) laki-laki, hasil tes positif VCT sebanyak 15 responden (25,0%) dan 45 responden (74,0%) dengan uji VCT negatif, responden yang memiliki riwayat pengobatan sebelumnya ada 54 responden (90,0%), responden yang memiliki riwayat kontak dengan TB sebanyak 45 responden (78,3%), yang memiliki pengetahuan sebanyak 45 responden (75,6%) Responden dengan resistansi obat anti tuberkulosis sebanyak 57 responden (95%). Hasil uji statistik dengan uji Chi-Square menunjukkan ada hubungan yang signifikan antara riwayat pengobatan dengan resistensi obat anti tuberkulosis yang memiliki nilai $p = 0,024 < \alpha = 0,05$. Namun, tidak ada hubungan antara jenis kelamin dan pengetahuan dengan resistensi obat anti tuberkulosis, nilai p 0,56 dan 0,566 (p value $> \alpha = 0,05$). Dianjurkan kepada petugas kesehatan untuk memberikan pendidikan kesehatan bagi pasien dan keluarga mereka, sehingga mereka dapat menjalani pengobatan hingga dinyatakan sembuh. Hal tersebut dapat mencegah pasien menderita resistansi obat anti tuberkulosis.

Kata kunci: Tuberkulosis, resistensi obat anti tuberkulosis, riwayat pengobatan, jenis kelamin, pengetahuan

INTRODUCTION

Tuberculosis become crucial diseases in the world. This disease can be transmitted quickly because of its spread through the air. This deployment occurs when the TB Patients are coughed and sneezed so that the droplets containing *mycobacterium tuberculosis* can be exposed to anyone who is around the patient.

In 1993 the *World Health Organization* (WHO) is declared TB as very important and serious public health problem. WHO (1993) is stated that the disease causes pulmonary tuberculosis is a global emergency because the disease could not well-controlled yet in most countries in the world. This is due to the many patients who are not successfully treated, and it will cause death due to by infectious diseases.¹

Every year there are 9 million new cases and death cases nearly 2 million people. In 2015, Indonesia has 2nd rank after India with TB incident reaching 330,910 cases. The incidence of TB continues to increase, the government is implemented the DOTS strategy (*Directly Observed Treatment Short-course*) optimally to combat TB. DOTS is a medical supervision directly in a short period which is expected to perform early diagnosis and appropriately to unexpected² TB through microscopic examination.

This strategy has proven to be the most cost effective¹. This strategy focuses on finding and healing TB patients by breaking the TB chain of transmission as well as to reduce the incidence of TB in the community.

Implementation of DOTS strategy is proved able to decrease TB cases in Indonesia. But other problem arised is related to TB in Indonesia today, which is the increasing cases of MDR-TB (*Multi Drug Resistant*). MDR-TB is a resistant form of TB two most potent anti tuberculosis drugs, namely *Rifampicin* and *Isoniazid*.¹

Data WHO *Annual report* 2017 has put Indonesia in 9th rank of the 27 countries with the highest burden of MDR-TB patients in the world with an estimated 32000 cases. Estimated MDR-TB cases number of among notified pulmonary cases are 10000 cases. There are 2,8% of TB cases with MDR-TB among new cases. In 2013, there are 809 notified case in Indonesia and 51% have success treatment.³ Based on Medical Record from Labuang Baji hospital Makassar, there were 162 cases of MDR-TB in South Sulawesi from Makassar and other districts in South Sulawesi.⁴

Most cases of MDR-TB is a chronic cases caused by the failure of the first categories of treatment. The results of the 2010 study from Tehran, Iran, are stated that there were 78 patients with MDR-TB, 46.8% of Afghan patients and 2.1% in Bangladesh. The patient's status is immigrant or refugee. That means if the resident patient becomes a risk factor for MDR-TB incidence. This suggests that there is a possibility that TB patients who become immigrants and they have drop out of treatment can be MDR-TB case. The case of MDR TB in HIV-infected TB patients is twice than non-HIV-infected TB patients. With the increasing cases of

HIV infection, it is no doubt that it will stimulan the higher occurrence of MDR TB in Indonesia.⁵

Unfavorable treatment of TB health services in China in 2012 is also a risk factor for MDR-TB. This includes the availability of TB drugs in the health care center and treatment monitoring center of patients 95% did not meet the standards, including the availability of medicines in health care center so that the patients possible dropped out from the treatment.⁶

According to Dedi research (2010), there were 23.8% of patients who receive late TB treatment although having good communication, information and education about TB.⁷ The correct information will be accept from healthcare worker through health education to increase knowledge of the patients. Knowledge of the patients can support their self to do the treatment. Factors associated with loss of follow up during treatment for multi drug resistant TB (MDR-TB) are TB knowledge of the patient, health care worker, and vomiting as adverse drug reaction.⁸

However, different research by Mekonnen (2015), is stated that there was no significant relationship between sex, age, educational status, history of smoking, BCG vaccination, with MDR-TB status among pulmonary TB cases, but there is a significant correlation between history of previous treatment with MDR-TB status.⁹ Other reported associated factors include occupation, education status, rural residence,^{10,11} older age, male sex,^{10,12} underlying health conditions such as HIV infection and diabetes mellitus.¹³

Labuang Baji Hospital is the referral center for MDR-TB examination in South Sulawesi, while the number of MDR-TB patients reaches 162 cases, the MDR-TB case continues to increase.⁴ As an MDR-TB referral center, Patients from various regions came to confirm the type of TB suffered. Based on this background, the authors are interested in conducting research on factors related to resistance of anti tuberculosis drugs in patients with Pulmonary Tuberculosis at Labuang Baji Makassar Hospital.

METHOD

This study is use descriptive analytic research design with cross sectional study approach to determine the factors of anti-tuberculosis drug resistance from TB patients in Labuang Baji Hospital. The population is TB patients at Labuang Baji hospital since 2016 until July 2017. The sample size in this research is determined by using categorical analytic sample based on research result about the influence of drug adherence in tuberculosis patients with success therapy in Great Comunity Health Center for Lung in Surakarta, patients who adhered to treatment had 76% efficacy therapy while non-adherent only 4%. Large samples are required with type I error of 5%, type II error of 10% using two-way hypothesis. Thus, the sample size of each group is 30, so the sample required in this study is 60 people.

The sample in this research is pulmonary tuberculosis patients from Labuang Baji Hospital. The sample is selected through simple random sampling technique. The study sample is TB patient who have positif examination of BTA, and are stated MDR through GenXPert examination seen on the patient's medical record. Patients given informed consent to be respondents and structured interviews are conducted based on questionnaires. Measurements of knowledge according to patient perception are done through instrument made by the researcher using guttman scale. True statement given score 1 and wrong statement given score 0. Good knowledge is performed if score more than mean (average value). In the history of treatment variables are conducted interviews directly to respondents to see the history of previous treatment including category I or category II. Variable History of TB contact is conducted through interviews with respondents to find out that the people closest to TB patients maybe from the family, neighbors or colleagues and friends of respondents. While the HIV and anti tuberculosis resistant are known from the respondent's medical records provided by health worker.

RESULT AND DISCUSSION

Univariate Analysis

Univariate analysis in this study will describe the frequency distribution of the variables in this research. The frequency distribution of age, sex, HIV infection, treatment history and contact with TB patients, the officer's behavior and resistance frequency distribution anti tuberculosis drug are the variables in the research.

Table 1. Univariate variable frequency distribution in RSUD. Labuang Baji Makassar Year 2017

Variables	Frequency (n)	Percentage (%)
Age		
15–34 years old	34	56.7
35–54 years old	26	43.3
Sex		
Male	25	41.7
Female	35	58.3
HIV infection		
Negative	45	74.0
Positive	15	26.0
Treatment History		
Yes	54	90.0
No.	6	20.0
Contacts TB		
Yes	47	78.3
No.	13	21.7
Knowledge		
Poor	15	75.0
Good	45	25.0
Anti-Tuberculosis Resistant		
Negative	3	5.1
Positive	57	95.0

Bivariate Analysis

Bivariate analysis is performed by using Chi-Square test to see the relationship of gender, history of treatment and knowledge with resistance of anti tuberculosis drug in pulmonary tuberculosis patient at Labuang Baji Makassar Hospital.

The relationship between sex and anti-tuberculosis drug resistance in TB patients in RSUD Labuang Baji

From the research result it can be seen that female respondents with positive anti tuberculosis drug resistance were 34 respondents (56.7%), while men with positive anti tuberculosis drug resistance were 23 respondents (38.3%). The respondents with negative anti tuberculosis drug resistance in women were 1 respondent (1.7%) and 2 respondents (3.3%) in men. The studies in Georgia which reveal that female were at higher risk of MDR-TB compared with male. The reason is postulated by the study, such as the role of women as care givers which may have predisposed them to developing MDR-TB as they have longer contact at home with sick MDR-TB patients than men. Especially when the MDR-TB treatment was not widely available in the country.¹⁴

Based on Chi-square statistic test with Fisher's Exact Test derived value $p = 0,565 > (\alpha = 0,05)$. Thus it can be concluded that there is no significant relationship between gender with anti tuberculosis drug resistance from tuberculosis patient in Labuang Baji Hospital. This result supported by Omar research who stated that there is no significant relationship between MDR-TB incidence and gender.¹⁵ Other reported that there is associated sex and cases of resistant TB.¹⁶

In the current global drug resistance survey report, the association between sex and MDR-TB was not clearly demonstrated. Some countries in the former Soviet Union reported a higher prevalence among males compared to females. This was thought to be related to alcohol dependency and imprisonment status where more men than women are involved.¹⁷

The relationship between treatment history and anti-tuberculosis drug resistance in TB patients in RSUD Labuang Baji

From the results in Table 2 it can be seen that respondents with positive anti tuberculosis drug resistance and never had a history of treatment as much as 53 respondents (88.3%). They do not have history of treatment as much as 4 respondents (6.7%), as for respondents with negative anti tuberculosis drug resistance and 1 treatment (1.7%) and 2 respondents (3.3%) did not have a history of treatment.

Based on the results of the statistical test *chi-square* with *fisher's exact test* is showed that there were significant association between history of treatment with resistance of anti tuberculosis drug in TB patient in Labuang Baji Hospital ($p_{value} = 0.024 < \alpha = 0.05$). Others reported associated that treatment history of tuberculosis is strong risk factor for bacterial resistance to anti tuberculosis drugs.^{18,19}

Table 2. Relationship of category Gender, treatment history and knowledge in anti tuberculosis drugs resistance on TB patients in hospitals Labuang Baji Tahun 2017

Variables	Anti Tuberculosis Drug Resistance						P
	Negative		Positive		Amount		
	N	%	N	%	Total	%	
Gender							p = 0,56
Man	2	2.7	23	38.4	25	41.7	
Women	1	1.4	34	57.5	35	58.3	
Treatment History							P = 0.024
Yes	1	1.7	53	88.3	54	90.0	
No	2	3.3	4	6.7	6	10.0	
Knowledge							P = 0.566
Good	3	5.0	42	70.0	45	75.0	
Less	0	0	15	25.0	20	25.0	

The patients who have previous of treatment history had 9,49 times to be MDR-TB than without previous of treatment history.²⁰ It is well understood that bacterial factor play great role in the spread of MDR-TB. With the population MTB, spontaneous mutation in genes responsible for drug resistance for all first line and some second line drugs, thus scenarios are highly pronounced by misuse of drugs result in rapid selection of drug resistant mutants.²¹

The relationship between knowledge and anti-tuberculosis drug resistance in TB patients in RSUD Labuang Baji

Based on Table 2, we can explain if respondents with positive OAT resistance have good knowledge are 42 respondents (70,0%), while having knowledge less are 15 respondent (25,0%). The respondents with negative OAT resistance with good knowledge are 3 respondents (5.0%).

Based on Chi-square statistic test with Fisher's Exact Test, we get value $p = 0,566 > (\alpha = 0,05)$. Thus it can be concluded that there is no significant relationship between knowledge with anti-tuberculosis drug resistance in TB patients in Labuang Baji Hospital Makassar. According to the researchers' assumptions, some respondents who experience positive OAT resistance but lack knowledge, this is caused of a better understanding of treatment and MR-TB is a close relative. This research is different with Marahatta's research which states that there is a relationship between knowledge with MDR-TB.²² A lack of knowledge about the treatment in progress have an impact on disease transmission and treatment outcomes. Health education must be done to prepare the patient about knowledge of TB, disease-causing agent, transmission, and treatment that will be undertaken.

CONCLUSION

There is correlation between treatment history and anti tuberculosis drug resistance in TB patient at RSUD Labuang Baji Makassar. Recommendation to nursing profession in

order continuously improve knowledge, attitude and skill in assisting patient on TB treatment and motivate patient to adherence treatment are needed.

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