FACTORS WHICH INFLUENTIAL TO CONVERSION BTA AND CULTURE IN MULTI-DRUG RESISTANCE TUBERCULOSIS PATIENTS AT H. ADAM MALIK GENERAL HOSPITAL MEDAN YEAR 2020- 2021

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ABSTRACT

Conversion of BTA test and culture is an indicator of monitoring MDR TB treatment where the state of Mycobacterium tuberculosis simultaneously shows negative results on BTA examination and culture. The purpose of this research is to find out which factors influence the conversion of AFB and culture in multi-drug resistance tuberculosis patients at H. Adam Malik General Hospital Medan year 2020-2021. This study aims to determine the factors that influence BTA conversion and culture in MDR TB patients at H. Adam Malik Hospital Medan in 2020 - 2021. This descriptive observational study was conducted with across sectional design. The population is all MDR TB patients recorded at the MDR TB Poly of H.Adam Malik Hospital who started treatment from 2020 – 2021 as many as 104 people. by virtue Participating in other clinical trials or taking any studied drug in the 3 months prior to study initiation High likelihood of follow-up (in the opinion of the doctor-researcher) unwillingness or inability of the patient to comply with the study protocol (in the opinion of the doctor-researcher). The number of samples was 50 people. Univariate and bivariate data analysis using chi-square statistical test, with 95% confidence level ($α=0.05$). The results of the bivariate analysis showed that the variables of medication adherence ($p = 0.007$) ($p = 0.001$), drug side effects ($p = 0.047$) ($p = 0.008$), drug ingestion supervisors ($p = 0.001$) ($p = 0.028$), and distance to health care ($p = 0.025$) ($p = 0.047$) together had a significant effect on BTA conversion and culture of MDR TB patients. The results of this study were medication adherence had a significant effect on AFB conversion and culture in MDR TB patients. Drug side effects factor had a significant effect on AFB and culture conversion in MDR TB patients. AFB and culture conversion in MDR TB patients. To MDR TB patients to regularly carry out treatment, consult if there are side effects, and control regularly until treatment is complete. For the entire community to implement a clean and healthy lifestyle (PHBS).

Keywords: MDR TB, BTA Conversion, Culture Conversion, Intrinsic Factor, Extrinsic Factor

Mayer Remora Situmorang et. al | Factors Which Influential To Conversion BTA And Culture In Multi-Drug Resistance Tuberculosis Patients At H. Adam Malik General Hospital Medan Year 2020- 2021

(428-442)

INTRODUCTION

Pulmonary tuberculosis is a global problem and is still a major public health problem, Indonesia is a country with the 3rd most tuberculosis patients in the world after India and China. In 2004 it was estimated that the number of tuberculosis patients in Indonesia was around 10% of the total number of tuberculosis patients in the world, every year there are 539,000 new cases and 101,000 deaths. The incidence of positive AFB (Acid Resistant Bacilli) tuberculosis cases is around 110 per 100,000 population (Ministry of Health, 2008).

About one third of the world's population has been infected by Mycobacterium tuberculosis. In 1995, it was estimated that there were 9 million new tuberculosis patients and 3 million deaths from tuberculosis worldwide, 95% of tuberculosis cases and 98% of deaths from tuberculosis in the world, occurred in developing countries. Likewise, women's deaths due to tuberculosis are more than deaths due to pregnancy, childbirth and the puerperium. Seventy-five percent of tuberculosis patients are the most economically productive age group (15-50 years). An adult tuberculosis patient, will lose an average of 3 to 4 months of working time. This resulted in a loss of annual household income of around 20-30%. If he dies from tuberculosis, he will lose about 15 years of income. Apart from being economically detrimental, tuberculosis also has other negative impacts, socially stigmatized and even ostracized by society.

Since 1995 the pulmonary tuberculosis eradication program has been implemented using the DOTS (Directly Observed Treatment, Shortcourse Chemotherapy) strategy recommended by WHO. The main focus of DOTS is finding and curing patients, priority is given to patients with infectious type tuberculosis. This strategy will break the transmission of tuberculosis and thereby reduce the incidence of tuberculosis in the community. Finding and curing patients is the best way to prevent tuberculosis transmission. In the DOTS strategy program, short-term (6 months) Anti-Tuberculosis Drug (OAT) guidelines for pulmonary tuberculosis cases are grouped into 3 categories based on the results of the sputum smear test and X-ray examination, namely category I OAT for new patients with pulmonary tuberculosis with positive smear tests and new patients with negative smear tests or positive X-rays who are seriously ill and extra-severe lungs who have never taken OAT or if they have had less than one month, OAT category II for patients with recurrent pulmonary tuberculosis (relapse of AFB). positive, and failed patients with positive AFB), and OAT category III for new AFB patients with negative AFB and positive X-rays.

Data on pulmonary tuberculosis patients undergoing the DOTS Category 1 treatment program at the Surabaya City Health Office from January to December 2009 in Semampir sub-district covering 3 areas of the Pegirian Health Center with smear-positive patients with 66 patients and a cure rate of 78%, Sidotopo Health Center with positive smears of 16 patients and a cure rate of 78%, and Wonokusumo Health Center with positive smears of 13 patients and a cure rate of 94% (Surabaya City Health Office, 2010).

The conversion of AFB sputum in pulmonary tuberculosis sufferers is largely determined by factors of pulmonary tuberculosis sufferers, health workers, and the patient's environment (Kanai, 1991). Factors in pulmonary tuberculosis patients associated with the incidence of BTA conversion include medication adherence, co-morbidities, nutritional status, eating

patterns and consumption, life style, the role of the family as drug swallowing supervisor (PMO) and the home environment where the patient lives. Health worker factors associated with the incidence of AFB conversion include knowledge of the implementation of the DOTS program and its application in the field and the ability of laboratory personnel to perform smear examination on the sputum of pulmonary TB patients (Ministry of Health, 2008).

Of the estimated 465,000 TB RO patients, only 206,030 were found and 177,099 (86%) were treated, with a global treatment success rate of 57% (Kemenkes RI, 2020). Based on the WHO Global TB Report in 2020, Indonesia has a TB burden with an estimated number of people falling ill reaching 845,000 with a death rate of 98,000 or the equivalent of 11 deaths per hour. The estimated cases of RR/MDR TB in Indonesia are 24,000 cases with a rate of 8.8 per 100,000 population.

Estimates of TB RR/ MDR TB among new TB are 2.4% and 13% among TB patients on repeated treatment. The aim of the MTPTRO program is to reduce morbidity and mortality due to MDR TB and break the chain of transmission in the community by finding and treating sufferers (Kemenkes RI, 2020). Mycobacterium tuberculosis (Mtb) resistance to anti-tuberculosis drugs (OAT)is a condition where the OAT given is already resistant to these bacteria(Farida, 2020).

Drug Resistance TB consists of: 1) Primary resistance (new cases) namely drug resistance in patients who have never received anti-TB drugs or have received OAT less than one month; 2) Secondary resistance (cases that have been treated), namely resistance medication in patients who have been on anti-TB treatment for at least one year month (Wibowo, 2016).

Globally in 2019, it is estimated that 3.3% of new TB patients and 17.7% from patient

TB Which Once treated is patient TB resistance drug (TB RO).

From estimation 465,000 patient TB RO the, only 206,030 were found and 177,099 (86%) treated, with success rates global treatment 57% (Kementerian Kesehatan RI, 2020).

In Indonesia, the estimated TB RO is 2.4% of all new TB patients and 13% of previously treated TB patients by the total estimate incident case TB RO of 24,000 or 8.8/100,000 population (Chakaya et al., 2021).

Multi-Drug Resistance Tuberculosis (MDR TB) is a type of TB resistance against two first-line anti-TB drugs, namely isoniazid and rifampicin. MDR TB is increasingly difficult to treat due to limited treatment and expensive treatment, recommended drugs are not always available, and many side effects. The occurrence of drug resistance in MDR TB patients according to Munir (2008) is generally influenced by 4 factors, namely patient factors, doctor factors, drug factors, and health service factors.

From the endurance journal entitled "HEALTH PROMOTION AND LITERACY MODELS TO INCREASE THE AUTONOMY OF TUBERCULOSIS PATIENTS" it is said that, the success rate of the Tuberculosis program in Tanjungpinang City is less than 90% so there is a risk of increasing TB drug resistance. (Khariroh, 2022)

Based on the article entitled Strategies to Combat Multi-Drug Resistance in Tuberculosis by Vinayak Singh and Kelly Chibale it can be explained that Modern-day standard TB chemotherapy is effective at treating drug-susceptible (DS) disease requires 6 months of administration using a combination regimen containing INH, rifampicin (RIF), pyrazinamide (PZA), and ethambutol (EMB). The emergence of

Mayer Remora Situmorang et. al | Factors Which Influential To Conversion BTA And Culture In Multi-Drug Resistance Tuberculosis Patients At H. Adam Malik General Hospital Medan Year 2020- 2021

(428-442)

HIV/TB comorbidity led to the declaration of TB as a global public health emergency by the World Health Organization (WHO) in 1993. This is further worsened by a rise in diabetes which results in a more than 3-fold increase in the risk of TB, a bigger risk than HIV in certain regions.

Factors include how well doctors provide education related to TB disease itself and how to carry out treatment. Patient factors include the presence or absence of OAT drinking supervisors, family support, the patient's level of economic ability, the distance of home to health care, the patient's level of education and knowledge of TB itself.

Drug factors include patient knowledge about the type, dosage, use, and side effects of OAT. Initial preparation in the treatment of MDR TB is a supporting examination that aims to determine the patient's initial condition, including examination of various organ functions (kidney, liver, heart), electrolyte examination, and various other laboratory tests (Ministry of Health, 2020).

Patients with Rifampicin-resistant Mtb results from the low-risk TB RO group should undergo a repeat TCM examination using a second good quality sputum at the original TCM health facility.

Happening resistance drug on patient TB MDR according to (Sun, Gui, Wu, Zhang, & Yan, 2022) on generally influenced by 4 factors, namely patient factors, doctor factors, drug factors, and factors service health.

Factor patient covers There is nope supervisor drink OAT, support family, level ability economy patient, distance House to place service health, level education and patient knowledge of TB itself (Nunn et al., 2014). Drug factors include patient knowledge about type, dose, usage, as well as effect side from OAT (Caren, Iskandar, Pitaloka, Abdulah, & Suwantika, 2022).

Research by Widyasrini, et al in 2017 which aims to determine the factors that influence the success of MDR TB treatment, found that the success of TB treatment is influenced by age and side effects medicine (Widyasrini, Probandari, 2017).

In line with research on the evaluation of treatment outcomes of MDR TB patients by Herlina and colleagues who concluded that age and drug side effects affect the success of patient treatment (Herlina & Vestabilivy, 2015). Treatment adherence is important to avoid MDR TB and failure in treatment (Bawonte, Mambo, & Masengi, 2021) Disobedience of TB patients in taking medication regularly is one of the obstacles to achieving cure rates. The high rate of drug withdrawal will result in high cases of resistance to OAT. The publication of research by Yang 2022 also states that the incidence of MDR TB is determined by drug swallowing supervisors, drug side effects, medical history, type 2 DM and routine care (Yang et al., 2022)

OAT used in the treatment of tuberculosis and MDR TB is divided into several groups. In the treatment of tuberculosis, the types of drugs used include Isoniazid (H), Rifampicin (R), Pyrazinamide (Z), Streptomycin (S), and Ethambutol (E).

Initial preparation in the treatment of MDR TB is a supporting examination that aims to determine the patient's initial condition, including examination of various organ functions (kidney, liver, heart), electrolyte examination, and various other laboratory tests (Kemenkes RI, 2020).

In accordance with WHO recommendations in 2020, treatment of TB RO in Indonesia currently uses a combination without injection drugs, which is divided into two, namely short-term (9-11 months) and

LLDIKTI Wilayah X

Mayer Remora Situmorang et. al | Factors Which Influential To Conversion BTA And Culture In Multi-Drug Resistance Tuberculosis Patients At H. Adam Malik General Hospital Medan Year 2020- 2021

(428-442)

long-term (18-20 months) treatment regimens.

In accordance with WHO recommendations in 2020, treatment of TB RO in Indonesia currently uses a combination without injection drugs, which is divided into two, namely short-term (9-11 months) and long-term (18-20 months) treatment regimens. Intrinsic factors include age, gender, co-morbidities, medical history, medication adherence, and drug side effects. Intrinsic factors include age, gender, co-morbidities, medical history, medication adherence, and drug side effects. Extrinsic factors include supervisors swallowing drugs and distance to health facilities. Extrinsic factors include supervisors swallowing drugs and distance to health facilities.

In addition to some of the factors above, other factors such as program and health system factors can also affect the incidence of MDR TB. These factors are factors in the availability of OAT in health services and patient tracing programs, namely efforts to persuade patients who are negligent in TB treatment that has not been carried out optimally can affect the incidence of MDR TB (Putri, Yovi, & Fauzia, 2015)

Patients who fail conversion have a risk of 4.2-20.63 times to experience treatment failure or recurrence (Uddin et al., 2021). Failure of conversion after treatment will have an impact on increasing cases of resistance or MDR TB. MDR TB cases at H.Adam Malik Hospital Medan have increased in the past two years. The purpose of this research is to find out which factors influence the conversion of AFB and culture in multi-drug resistance tuberculosis patients at H. Adam Malik General Hospital Medan year 2020-2021. From the number of patients who died, it can be concluded that the treatment of MDR TB is still very difficult.

METHOD

This descriptive observational study was conducted with a *cross sectional* approach. *Cross-sectional* research is research that aims to study the correlation between risk factors and effects, by means of approach, observational, or data collection. *Cross-sectional* research only observed once and measurements were made on subject variables at the time of the study (Sibbald, Paciocco, Fournie, Van Asseldonk, & Scurr, 2021).

In this study the risk factors included intrinsic factors (age, sex, disease companion, history treatment, obedience drink drug, And effect side) And factorextrinsic (supervision in taking medication and distance to health facilities). Whereas effect is conversion BTA And culture.

The population in this study were all patients declared as TB casesMDR and recorded in the MDR TB Infection Polyclinic at H. Adam Malik Hospital Medan in 2020-2021 as much 104 person.

The stages of presenting the data are Preliminary Study and Research Licensing, then Collection of Secondary Data from Patient Medical Records, after that continue Collection of Primary Data from Questionnaires and Interviews. After that, Data Processing and Analysis then Data Presentation, then Discussion, Conclusions and Suggestions, publication.

The sampling technique was carried out by Engineering probability sampling that is a sampling technique that provides equal opportunities/opportunities for each elements (members) of the population to be selected as members of the sample. So that sample obtained as many as 50 people. This sampling technique uses consecutive sampling that is technique taking sample from all subject

Mayer Remora Situmorang et. al | Factors Which Influential To Conversion BTA And Culture In Multi-Drug Resistance Tuberculosis Patients At H. Adam Malik General Hospital Medan Year 2020- 2021

(428-442)

Which come sequentially And meet the selection criteria included in the study up to the number of subjects who needed fulfilled (Sugiyono, 2018).

Technique collection data in study This covers data primary And data secondary.Data primary is data Which obtained from charging questionnaire nor interview of MDR TB patients in the waiting room of the MDR polyclinic at H. Adam Malik Hospital. Interview patient TB MDR done on moment patient come to RSUP H. Adam Malik For do

inspection routine monthly. Data secondary form data documentation/ record medicalpatient TB MDR in RSUP H. Adam Malik. Etichal clearence number is 1125/KEPK/USU/2022

RESULT AND DISCUSSION

MDR TB Patient Characteristics based on Intrinsic Factors for BTA Conversion and Culture

Tabel 1. MDR TB Patient Characteristics based on Intrinsic Factors for BTA Conversion and Culture at H. Adam Malik Hospital in 2020 – 2021

No	Variable	BTA conversion		No BTA Conversion		Culture Conversion		No Conversion Cultures	
		n	%	N	%	n	%	n	%
1	Age								
	15-50 yrs	22	56,4	9	81,8	8	61,5	23	62,2
	>50 yrs	17	43,6	2	18,2	5	38,5	14	37,8
2	Gender								
	Man	29	74,4	7	63,6	8	61,5	28	75,7
	Woman	10	25,6	4	36,4	5	38,5	9	24,3
3	Comorbidities								
	None	18	46,2	4	36,4	7	53,8	15	40,5
	Diabetes	18	46,2	4	36,4	5	38,5	17	45,9
	HIV	2	5,1	-	-	1	7,7	1	2,7
	Kidney Disorders	-	-	-	-	-	-	-	-
	Other	1	2,6	3	27,3	-	-	4	10,8
4	Treatment History								
	New	38	97,4	9	81,8	12	92,3	35	94,6
	Failed Treatment	-	-	1	9,1	1	7,7	-	-
	Relapse	1	2,6	-	-	-	-	1	2,7
	Deuteronomy	-	-	1	9,1	-	-	1	2,7
5	Adherence to taking medication								
	Yes	38	97,4	8	72,7	12	92,3	15	40,5
	Not	1	2,6	3	27,3	1	7,7	22	59,5
6	Side Effects								
	Exist	12	30,8	7	63,6	1	7,7	18	48,6
	None	27	69,2	4	36,4	12	92,3	19	51,4

Based on medication adherence in the conversion group, 38 people (97.4%) were adherent to taking medication and only 1 person (2.6%) was non-adherent to taking medication. While the group that did not convert patients who were adherent and regularly took medication as many as 8 people (72.7%) and those who did not comply took medicine 3 people (27.3%).

Based on drug side effects, the BTA conversion group found that patients did not experience side effects as many as 27 people (69.2%), while the group that did not experience BTA conversion experienced side effects during treatment as many as 7 people (63.6%).

MDR TB Patient Characteristics based on Extrinsic Factors for BTA Conversion and Culture

Table 2. MDR TB Patient Characteristics based on Extrinsic Factors for BTA Conversion and Culture at H. Adam Malik Hospital in 2020 – 2021

No	Variable	BTA conversion		No BTA Conversion		Culture Conversion		No Conversion Cultures	
		n	%	N	%	N	%	n	%
1	Drug swallowing supervisor (PMO)								
	Exist	34	87,2	3	27,3	12	92,3	22	59,5
	None	5	12,8	8	72,7	1	7,7	15	40,5
2	Distance to healthcare								
	Near (<3 km)	22	56,4	2	18,2	9	69,2	15	40,5
	Far (>3 km)	17	43,6	9	81,8	4	30,8	22	59,5

Of the total sample of 50 people, 39 people experienced BTA conversion (78%) and 11 people did not convert BTA (22%). The characteristics of MDR TB patients based on extrinsic factors to BTA conversion can be seen in Table 2. Based on the presence or absence of PMO (drug swallowing supervisors), patients who experienced BTA conversion stated that there were PMOs who supervised to swallow drugs as many as 34 people (87.2%), and in patients who did not

convert BTA stated the absence of PMO as many as 8 people (72.7%). The distance of the patient's domicile to health services is close to BTA conversion patients as many as 22 people (56.4%) and far away as many as 17 people (43.6%). Meanwhile, in patients who did not convert BTA, the distance to health services was close as many as 2 people (18.2%) and far as 9 people (81.8%).

The Effect of Age on BTA Conversion and Culture of MDR TB Patients

Table 3. The Effect of Age on BTA Conversion and Culture of MDR TB Patients at H. Adam Malik Hospital in 2020-2021

Age	BTA conversion		No BTA Conversion		p value	Culture Conversion		No Conversion Cultures		p value
	n	%	n	%		n	%	n	%	
15-50 years	22	56,4	9	81,8	0,125	8	61,5	23	62,2	0,968
>50 years	17	43,6	2	18,2		5	38,5	14	37,8	
Sum	**39**	**100**	**11**	**100**		**13**	**100**	**37**	**100**	

Statistical test results in table 3 above showed that there was no significant effect between age and BTA conversion of MDR TB patients (p = 0.125). Similarly, the results of bivariate analysis between age and culture conversion of MDR TB patients showed no significant effect (p = 0.968). The majority of respondents in this study are aged 15-50 years which is the economically productive age to work and produce something. According to researchers, most MDR TB patients are in the productive age group because the productive age has high mobility so that it is possible to easily contract with MDR TB bacteria.

The Effect of Sex on BTA Conversion and Culture of MDR TB Patients

Table 4. The Effect of Sex on BTA Conversion and Culture of MDR TB Patients at H. Adam Malik Hospital in 2020-2021

Gender	BTA conversion		No BTA Conversion		p value	Culture Conversion		No Conversion Cultures		p value
	n	%	N	%		n	%	n	%	
Man	29	74,4	7	63,6	0,489	8	61,5	28	75,7	0,953
Woman	10	25,6	4	36,4		5	38,5	9	24,3	
Sum	**39**	**100**	**11**	**100**		**13**	**100**	**37**	**100**	

Statistical test results in table 4. above showed that there was no significant effect between sex and BTA conversion in MDR TB patients (*p* = 0.489). Similarly, analysis of the effect of age on culture conversion in MDR TB patients (*p* = 0.953) showed no significant influence between the 2 variables. Although in this study the number of male respondents (36 respondents) was more than women (14 people), this according to bivariate analysis did not show a meaningful effect.

LLDIKTI Wilayah X

Mayer Remora Situmorang et. al | Factors Which Influential To Conversion BTA And Culture In Multi-Drug Resistance Tuberculosis Patients At H. Adam Malik General Hospital Medan Year 2020- 2021

(428-442)

The Effect of Comorbidities on BTA Conversion and Culture of MDR TB Patients

Table 5. The Effect of Comorbidities on BTA Conversion and Culture of MDR TB Patients at H. Adam Malik Hospital in 2020-2021

Comorbidities	BTA conversion		No BTA Conversion		p value	Culture Conversion		No Conversion Cultures		p value
	n	%	N	%		N	%	n	%	
Exist	21	53,8	7	63,6	0,563	6	46,2	22	59,5	0,405
None	18	46,2	4	36,4		7	53,8	15	40,5	
Sum	**39**	**100**	**11**	**100**		**13**	**100**	**37**	**100**	

Statistical test results in table 5. above shows that there is no significant effect between comorbidities on the occurrence of BTA conversion of MDR TB patients (p = 0.563). In line with the results of bivariate analysis, the effect of treatment history on the occurrence of culture conversion of MDR TB patients showed that there was no significant effect between treatment history and the occurrence of culture conversion of MDR TB patients (p = 0.405). In this study, the comorbidities that researchers found were dominated by Diabetes Mellitus (DM), which was as many as 22 people. According to researchers, the conversion of BTA examination results and cultures of patients who have DM comorbidities, because these patients maintain blood sugar levels so as not to interfere with treatment MDR TB. In line with the results of an interview with one of the respondents who had DM comorbidities, admitted that the person concerned routinely checked blood sugar and consulted health workers and maintain a healthy diet.

The Effect of Treatment History on BTA Conversion and Culture of MDR TB Patients

Statistical test results in table 6 above shows that the effect of treatment history on the occurrence of BTA conversion of MDR TB patients shows that there is no significant effect between treatment history on the occurrence of BTA conversion ($p = 0.765$). Similarly, the results of statistical tests of the effect of treatment history on the occurrence of culture conversion of MDR TB patients showed that there was no significant effect between treatment history and the occurrence of culture conversion of MDR TB patients ($p = 0.765$). From the results of interviews conducted by researchers on MDR TB patients, most patients dropped out of previous treatment or were irregular in usual TB treatment.

Mayer Remora Situmorang et. al | Factors Which Influential To Conversion BTA And Culture In Multi-Drug Resistance Tuberculosis Patients At H. Adam Malik General Hospital Medan Year 2020- 2021

(428-442)

Table 6. The Effect of Treatment History on BTA Conversion and Culture of MDR TB Patients at H. Adam Malik Hospital in 2020-2021

Treatment history	BTA conversion		No BTA Conversion		*p value*	Culture Conversion		No Conversion Cultures		*p value*
	n	%	N	%		n	%	n	%	
New Patients	38	97,4	9	81,8		12	92,3	35	94,6	
Failure/Recurrence/Recurrence	1	2,6	2	18,2	0,765	1	7,7	2	5,4	0,765
Sum	**39**	**100**	**11**	**100**		**13**	**100**	**37**	**100**	

This is because respondents consider it cured because clinical symptoms such as coughing are no longer present at the timeof treatment, even though treatment must be completed 6-9 months. Psend treatment before the treatment period is over or often stop taking medication during TB treatment causing resistance to OAT.

The Effect of Adherence to Taking Medication on BTA Conversion and Culture of MDR TB Patients

Table 7. The Effect of Adherence to Taking Medication on BTA Conversion and Culture of MDR TB Patients at H. Adam Malik Hospital in 2020-2021

Adherence to taking medication	BTA conversion		No BTA Conversion		*p value*	Culture Conversion		No Conversion Cultures		*p value*
	n	%	N	%		n	%	n	%	
Yes	38	97,4	8	72,7	0,007	12	92,3	15	40,5	0,001
Not	1	2,6	3	27,3		1	7,7	22	59,5	
Sum	**39**	**100**	**11**	**100**		**13**	**100**	**37**	**100**	

Statistical test results in table 7 above shows that there is a significant influence between the factor of adherence to taking medication on the occurrence of BTA coversion and culture conversion in patients with values ($p = 0.007$), and the factor of adherence to taking medication to co culture nversion in MDR TB patients with values ($p = 0.001$). In an interview that researchers conducted on MDR TB patients at RSUP H. Adam Malik, non-compliance or irregularity of patients in taking drugs is caused by patients often forgetting. Some patients also complain of side effects from taking the drug so that they stop taking the drug because they

LLDIKTI Wilayah X

437

Mayer Remora Situmorang et. al | Factors Which Influential To Conversion BTA And Culture In Multi-Drug Resistance Tuberculosis Patients At H. Adam Malik General Hospital Medan Year 2020- 2021

(428-442)

cannot stand the perceived side effects of the drug.

Adherence to regular medication taking medication is actually the key to successful healing of pasien TB (Ministry of Health, 2011). Non-compliance or irregularity of TB patients during the previous treatment period will result in genetic mutations of Mtb germs so that anti-TB drugs are not effective against TB germs.

The Effect of Drug Side Effects on BTA Conversion and Culture of MDR TB Patients

Table 8. The Effect of Drug Side Effects on BTA Conversion and Culture of MDR TB Patients at H. Adam Malik Hospital in 2020-2021

Side Effects	BTA conversion		No BTA Conversion		*p value*	Culture Conversion		No Conversion Cultures		*p value*
	n	%	n	%		N	%	n	%	
Exist	12	30,8	7	63,6	0,047	1	7,7	18	48,6	0,008
None	18	69,2	4	36,4		12	92,3	19	51,4	
Sum	**39**	**100**	**11**	**100**		**13**	**100**	**37**	**100**	

The results of statistical tests in table 8 above show that there is a significant influence between drug side effect factors on the occurrence of BTA coversion and culture conversion in MDR TB patients ($p < 0.05$). Fa ktor drug side effect on the occurrence of BTA coversion obtained a value ($p = 0.047$) and drug side effect factor on the occurrenceof culture co-nversion obtained a value ($p = 0.008$). In an interview that researchers conducted on MDR TB patients at the MDR Poly RSUP H. Adam Malik, some patients also complained of drug side effects so they stopped taking the drug because they could not stand the perceived drug side effects. This makes MDR TB difficult to cure and the risk of causing resistance to other OAT *(Pre-XDR and XDR)*. If side effects appear, it is likely that the patient will stop treatment without notifying the health facility staff (default), so an examination of symptoms of treatment side effects must be done before the patient starts MDR TB treatment. In addition, good and adequate handling of side effects is the key to successful MDR TB treatment.

The Effect of Drug Swallowing Supervisors on BTA Conversion and Culture of MDR TB Patients

The results of statistical tests in table 9 above show that there is a significant influence between the presence or absence of PMO factors on the occurrence of BTA conversion and culture conversion of MDR TB patients ($p < 0.05$). Factor presence or absence of PMO on the occurrence of BTA conversion obtained value ($p = 0.001$), and factor presence or absence of PMO on the occurrence of culture conversion obtained value ($p = 0.028$).

Mayer Remora Situmorang et. al | Factors Which Influential To Conversion BTA And Culture In Multi-Drug Resistance Tuberculosis Patients At H. Adam Malik General Hospital Medan Year 2020- 2021

(428-442)

Table 9. The Effect of Drug Swallowing Supervisors on BTA Conversion and Culture of MDR TB Patients at H. Adam Malik Hospital in 2020-2021

Drug swallowing supervisor	BTA conversion		No BTA Conversion		*p value*	Culture Conversion		No Conversion Cultures		*p value*
	n	%	n	%		N	%	n	%	
Exist	34	87,2	3	27,3	0,001	12	92,3	22	59,5	0,028
None	5	12,8	8	72,7		1	7,7	15	40,5	
Sum	**39**	**100**	**11**	**100**		**13**	**100**	**37**	**100**	

PMO is one of the success factors of the DOTS program and the success of therapy because it will affect the compliance of MDR TB sufferers in taking medication so that they are diligent and motivated to swallow drugs. PMO is very necessaryto ascertain whether the drug is really swallowed or not. From the researchers' interviews with respondents, information was obtained that some PMOs came from health service facilities (fasyankes) closest to the patient's domicile, in this case officers from the puskesmas where the patient was recorded. PMO officers from the puskesmas visit patients to their homes to make sure patients swallow medicine. However, there are some patients who complain of the absence of a PMO that supervises them to swallow the drug. This is mentioned because the distance to the patient's home is relatively far from the health center.

The Effect of Distance to Health Services on the Conversion of BTA and MDR TB Patient Culture

Table 10. The Effect of Distance to Health Services on the Conversion of BTA and MDR TB Patient Culture at H. Adam Malik Hospital in 2020-2021

Distance to Healthcare	BTA conversion		No BTA Conversion		*p value*	Culture Conversion		No Conversion Cultures		*p value*
	n	%	n	%		n	%	n	%	
Near <3 km	22	56,4	2	18,2	0,025	9	69,2	15	40,5	0,047
Far >3 km	17	43,6	9	81,8		4	30,8	22	59,5	
Sum	**39**	**100**	**11**	**100**		**13**	**100**	**37**	**100**	

The results of statistical tests in table 8 above show that there is a significant influence between the distance factor to health services on the occurrence of BTA conversion and culture conversion of MDR TB patients ($p < 0.05$). Factors distance to health services on the occurrence of BTA conversion obtained a value ($p = 0.025$) and

LLDIKTI Wilayah X

439

factors distance to health services on the occurrence of culture conversion of MDR TB patients obtained a value ($p=0.047$).

Most MDR TB sufferers have long distances to health services. In this study it was shown that there was a significant effect between distance to health services on AFB conversion and culture in MDR TB patients, the results of the chi square value were (p=0.025) (p=0.047).

The patient's residence which is far from the health service center will make it more difficult for the patient to take medicine every month. The long travel time indicates that access to health services is also far away and takes a long time. In general, MDR TB patients are in the low-income group. Low income and long distances to health services can cause sufferers to be unable to afford transportation. One of the causes of MDR TB sufferers is not taking routine treatment at health services because the distance is far, making it difficult to achieve the results of AFB and culture conversion.

This research is in line with research conducted by Sondakh which states that distance to health services has a relationship with the incidence of MDR TB (Sondakh, 2014). The information that the researchers obtained from the respondents was that the distance from the house to the health facility made patients lazy to come for treatment because they did not have the money to pay for it. In addition, the time spent going to the health facility is the reason patients don't get regular treatment.

The patient's stay far from the health care center will make it more difficult for patients to take medication every month. Long travel time indicates that access to health services is also far away and takes a long time. In general, MDR TB patients are low-income people. The lack of income and the long distance of health services can cause

sufferers to be unable to pay for transportation. One of the causes of MDR TB sufferers not doing routine treatment in health services is because of the long distance so it is difficult toachieve the results of BTA conversion and bia.

CONCLUSSION

Analysis of the factors that influence the conversion and culture of AFB in MDR TB patients at H. Adam Malik Hospital in 2020-2021 it can be concluded that adherence to taking medication has a significant effect on the conversion of AFB and culture in MDR TB patients. In addition, drug side effect factors significantly influence the conversion of AFB and culture in MDR TB patients. Then, the consumption factor has a significant effect on the conversion of AFB and culture in MDR TB patients. Also, the peer factor of health services has a significant effect on the conversion of AFB and culture in MDR TB patients. AFB and culture conversion in MDR TB patients.

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Mayer Remora Situmorang et. al | Factors Which Influential To Conversion BTA And Culture In Multi-Drug Resistance Tuberculosis Patients At H. Adam Malik General Hospital Medan Year 2020- 2021

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