Jurnal Profesi Medika : Jurnal Kedokteran dan Kesehatan
DOI: https://doi.org/10.33533/jpm.v18i2.9445
Vol 18 No 2 (2024) ISSN 0216-3438 (print); ISSN 2621-1122 (online)

ARTICLE

RESISTANCE PATTERNS IN SECOND-LINE SENSITIZATION TESTS AND THEIR EFFECT ON MDR-TB TREATMENT SUCCESS IN RELAPSED AND FAILED CASES

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ABSTRAK

Tuberculosis recurrence is caused by reinfection with Mycobacterium tuberculosis that has already been experienced or infection with a new strain of bacteria. The increasing incidence of TBMDR in the community accelerates the spread of TBMDR. Objective: To identify TBMDR treatment failure in relapse cases, and category 1 and 2 treatment failure. Method: Retrospective. Secondary data from the Ministry of Health SITB, 2017-2019 period shows that the sample size of relapses, category 1 and 2 treatment is 466 patients. Results: the relapse bivariate test and treatment failure categories 1 and 2 obtained a p-value of <0.05 (age 17-about 60 years and second-line sensitivity test). They are affected by HIV status. The regression results of the second sensitization test strongly influenced TB-relapsed patients to fail, dropout, and complete treatment compared to cured treatment patients, still-relapsed 17-44 years old patients, and category 1 and 2 treatment failure were more likely to be LFU than recover, and the second sensitivity test affected treatment failure and completion rather than recovery, although HIV status did not affect treatment outcomes. Conclusion: Strategy to reduce the rate of recurrence and conversion failure by examining genetic mutations (biomarkers) of M. tuberculosis

Keywords: Relapse; Treatment Failure; Sensitization Test; Outcome Treatment

АБСТРАКТ

Рецидив туберкулеза возникает в результате повторного заражения уже перенесенной инфекцией Mycobacterium tuberculosis или заражения новым штаммом бактерий. Рост заболеваемости туберкулезом в обществе ускоряет распространение ТБМДР. Цель: Выявить неудачи лечения ТБДРМ в случаях рецидива, а также неудачи лечения категории 1 и 2. Метод: Ретроспективный. Вторичные данные Министерства здравоохранения SITB за период 2017-2019 гг. показывают, что размер выборки рецидивов, категории 1 и 2 лечения составляет 466 пациентов. Результаты: бивариационный тест рецидивов и неудач лечения категорий 1 и 2 получил р-значение <0,05 (возраст 17-около 60 лет и тест чувствительности второй линии). На них влияет ВИЧ-статус. Результаты регрессии второго теста на чувствительность сильно повлияли на неудачу, отказ от лечения и завершение лечения больных с рецидивом туберкулеза по сравнению с вылеченными пациентами, на пациентов с рецидивом в возрасте 17-44 лет, а также на неудачу лечения 1 и 2 категории, которые чаще подвергались ЛФУ, чем выздоровлению, а второй тест на чувствительность повлиял на неудачу и завершение лечения, а не на выздоровление, хотя ВИЧ-статус не повлиял на результаты лечения. Выводы: Стратегия снижения частоты рецидивов и неудач конверсии путем исследования генетических мутаций (биомаркеров) M. tuberculosis

Ключевые слова: Рецидив; неудача лечения; тест на сенсибилизацию; исход лечения

Submitted: 6 October 2024. ; Received in revised form: 23 November 2024; Accepted: 6 December 2024; Available online ; 17 December 2024
Published regularly: December 2024

INTRODUCTION

There are around thirty percent of MDR-TB patients in Indonesia that are identified as suspected MDR-TB and are subjected to sensitivity testing. However, in nine percent of diagnosed cases, forty-five point one percent received a treatment regimen that was supported by DST results. The treatment was finished by 25.5% of the patients.[1] Global report in 2022 reported that the countries contributing to TB cases in the world are India (27%0, Indonesia (10%), and China (7.1%). Estimates Of MDR-TB in the world amounted to 410.000, but 17.586 cases discovered, consisting of 149.511 people detected MDR/RR-TB and 27.075 Pre-XDR/XDR-TB, still lower than in 2019, and people diagnosed and started treatment around 175.650 of the global TB treatment coverage target in 2018-2022 of 1.5 million.[2] This condition illustrated that there are still minimal cases of TBMDR diagnosis. Concerns are growing that the most common causes of MDR-TB health problems are relapse and line-1 or line-2 treatment failures.[3,4] Zhao and others in 2012, said that the drug-resistant TB epidemic in TB-burdened countries is a threat to TB program control. Mycobacterium TB strains are resistant to isoniazid and rifampicin. Two of the most powerful first-line drugs, then healthcare providers to a combination of second-line drugs, but MDR-TB strains can also grow resistant to second-line drugs. XDR TB strains may also be resistant to additional drugs on second-line drugs, greatly complicating therapy. TB resistance patterns in Indonesia show very high secondary resistance to one type of OAT or a combination of several types of OAT, increasing cases of MDR-TB.[5,7] Each of the altered anti-TB genes includes resistance to rifampicin, streptomycin, and quinolone. These genes include the rpoB gene for rifampicin, the katG gene for isofluoroquinolone, the gyrA gene for fluoroquinolone, and the Rsrs gene for aminoglycoside.[6,7] Recurrence is a recurrence of TB infection in the same person after successful treatment. Recurrence is a relapse with the same strain of mycobacterium tuberculosis bacteria or reinfection with a new strain's recurrence is usually associated with drug resistance (Mathema al, 2006).[8-12] Treatment failure of both category one and category two TB results from several factors such as patient ignorance about the disease, lack of compliance, regularity, and motivation, ineffective drug regimens or inadequate doses, irregular supply of drugs, and bioavailability and quality of drugs can increase the incidence of secondary drug resistance.[13]

In the report that was compiled by the Sistem Information Tuberculosis (SITB) for the period of 2017-2019, the suspected TBMDR criteria were dominated by 45.9% of relapse cases, 15.1% of category one treatment failure, and 5.4% of category two treatment failure. The results of the first-line drug sensitivity test diagnosed tuberculosis with multidrug resistance (TBMDR), while the results of the second-line drug sensitivity test diagnosed tuberculosis with pre-XDR and XDR status. Patients with RR (56.26%), MDR-TB (47.62%), Pre-XDR (3.7%), and XDR TB (7.9%) were the majority of those who were diagnosed with tuberculosis. The treatment failure outcomes that were achieved were 0.003%, and 25.4% of the patients dropped out of the program. This is connected to the criteria for suspected TBMDR relapse or treatment failure types 1 and 2, which might potentially hasten the development of widespread infection throughout the population. Less than thirty percent of patients who start treatment with TBMDR/PRE-XDR or XDR-TB do not respond to treatment."14"" For the goal of evaluating the pattern of recurrence in the second-line sensitization test and the effect on the efficacy of MDR-TB treatment in cases of relapse and treatment failure categories 1 and 2, this problem serves as the basis for research.

MATERIAL AND METHODS

Specifically, a retrospective cohort approach was utilized for this investigation. From 2017 to 2019, the sample was taken from the Tuberculosis Information System (SITB) that is maintained by the Ministry of Health of the Republic of Indonesia.

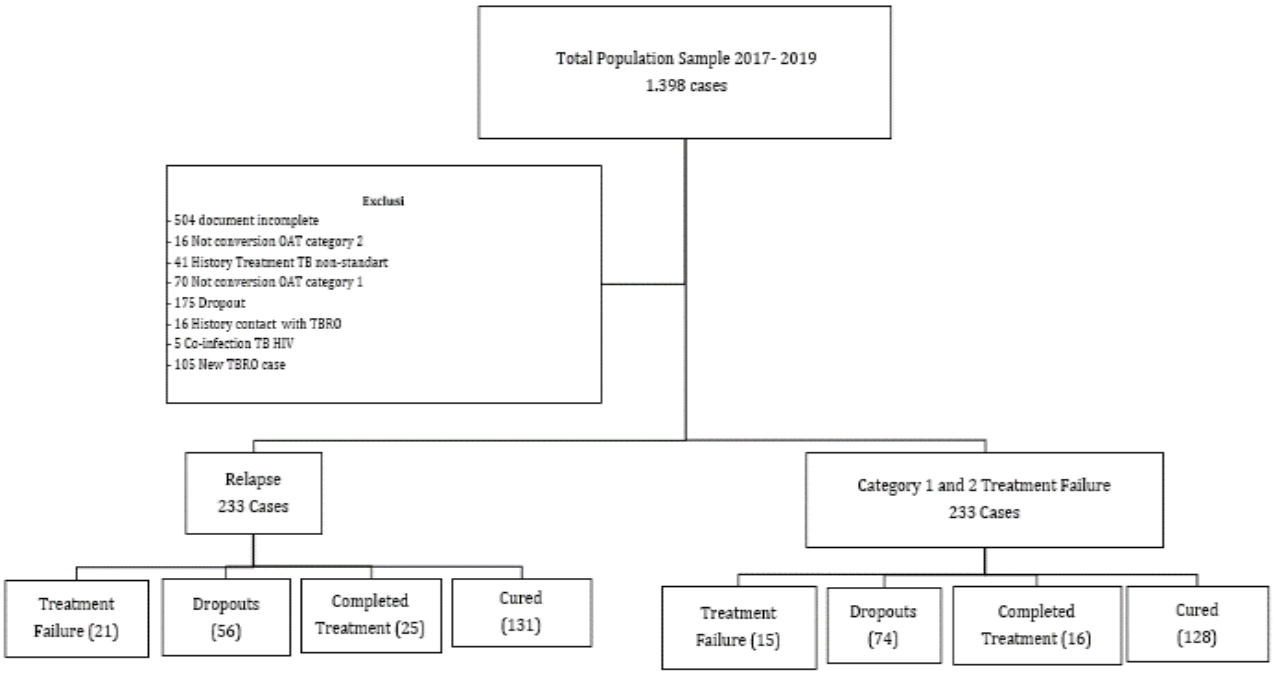
 DOI: https://doi.org/ 10.33533/jpm.v18i2.9445 Vol 18 No 2 (2024)

The research was conducted between March and April of 2024. The first figure participants in the research included individuals who were at least 17 years old, had been diagnosed with a suspected recurrence of multidrug-resistant tuberculosis (MDR-TB), had failed therapy in categories 1 and 2, and had experienced the outcomes of treatment failure, medication withdrawal, complete treatment, or recovery. The results of the polymerase chain reaction (PCR), the first and second sensitivity tests, the HIV test, and the treatment status are all included in reports that are complete.

During the process of conducting the analysis of the findings of the research, Microsoft Excel and SPSS version 23.0 were utilized as application software. In the event that the p-value that was obtained was lower than 0.05, the Kruskal-Wallis method was applied in order to carry out the analysis of the data. In addition, the multinominal logistic regression test contained the Eligibility Test, the Model Significance Test, and the Output Analysis. The latter included the effect size, the partial test, and the regression equation that was obtained, as well as the p-value, the Odd ratio, and the confidence interval (CI: 95%). After the research was finished, both ethical approval and informed consent were acquired from the participants. after the Institutional has provided its approval, as quickly as possible.

A decision was made to proceed with the research after receiving authorization from the Institutional Ethics Committee of the Faculty of Medicine at Syarif Hidayatullah State Islamic University in Jakarta (B-081/F12/KEPK/TL.00/12/2023).The aims of the study were explained to the participants, and they gave their written agreement to take part in the research.

Figure 1. The Procedure for Collecting a Study Sample



 DOI: https://doi.org/ 10.33533/jpm.v18i2.9445 Vol 18 No 2 (2024)

RESULT

Table 1. Characteristics of Suspect TBMDR Categories Relapse

Characteristic	n	Percentage (100%)
Gender :		
Male	145	61,2
Female	88	37,8
Age Group :		
17-44 years	136	58,4
45-59 years	84	36,1
>60 years	13	5,6
HIV Test :		
Negative	227	97,4
Positive	6	2,6
First line test:		
HR	79	33,9
RR	51	21,9
HRS	35	15,0
HRE	24	10,3
HERS	44	18,9
Second Line *test:*		
MDR	142	60,9
RR-TB	47	20,2
PRE-XDR	41	17,6
XDR	3	1,3
Outcome treatment:		
Failure	21	9,0
Loss to Follow Up	56	24,0
Complete	25	10,7
Cured	131	56,2

In cases of suspected TBMDR relapse, the majority of individuals are male (62%), aged between 17-44 years (58.36%), and have tested negative for HIV. The sensitivity tests for line one show 78.1% and 21.9% for RR, while line two sensitivity tests show 60.9% for TBMDR, 20.2%(RR), 17.6% (Pre XDR), and XDR (1.2%). The predominant majority of treatment outcomes result in cured (56.2%), with 10.7% complete treatment status due to lack of laboratory examination, followed by 24% Loss to follow-up (LTFU) and 9% failure, as shown in the Table.1

Table 2. Characteristics of Suspect TBMDR Categories 1 and 2

Characteristic	N	Percentage (100%)
Gender :		
Male	121	51,9
Female	112	48,1
Age Group :		
17-44 years	134	57,5
45-59 years	82	35,2
>60 years	17	7,3
TB Resistant suspect :		
Failure category 1	57	24,5
Failure category 2	176	75,5
HIV Test :		
Negative	232	99,6
Positive	1	0,4
First Line test:		
HR	62	26,6
RR	24	10,3
HRS	35	15,0
HRE	57	24,5
HERS	55	23,6
Second line test:		
MDR	158	67,8
RR-TB	19	8,2
PRE-XDR	53	22,7
XDR	3	1,3
Outcome treatment:		
Failure	15	6,4
Loss to Follow Up	74	31,8
Complete	16	6,9
Cured	128	54,9

In the study, the treatment failure of TBMDR was sorted as Category One (24.5%) and Category Two (75.5%). The distribution between male and female patients was similar (48-52%), the age average was 17-44 years (57.5%), and all patients had negative HIV test results. The results of line 1 sensitivity tests showed that TBMDR was 89.7% and 10.7% for RR. Meanwhile, in the line 2 sensitivity tests,

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TBMDR was 67%, 8%, RR was 8.2%, Pre-XDR was 22.7%, and XDR was 1.3%. While 54.9% of patients had successful treatment outcomes, 6.9% had a complete treatment due to a lack of laboratory examination results. Almost 31.8% went missing (Lost to follow-up), and 6.4% experienced treatment failure. Please refer to Table 2 for detailed information.

In Table 3, the relapse category showed statistically significant results with a p-value of less than 0.05 for the 17-44 ages group (p-value: 0.023; 95% CI: 0.022-0.028), a negative HIV test (p-value: 0.016; 95% CI: 0.014-0.018, and 2nd line sensitization test in MDR (p-value: 0.000; 95% CI: 0.000-0.000). These factors are evaluated as part of the treatment outcome (dependent variable), which include failure, loss to follow-up, complete treatment, and cure. The next step is to proceed with the logistic regression test.

Relapse category p-value <0.05 on the effect of age group 17-44 years (p-value: 0.020; 95% CI: 0.017-0.023) and line 2 sensitization test on MDR (p-value: 0.001; 95% CI: 0.001-0.002) on treatment outcome (dependent variable), including Failure, loss to follow up, complete and cured so a multinomial test was performed. (Table 4) The results of the study (Table 5) indicate a p-value of less than 0.05 in the first-line sensitivity test for both MDR (p-value: 0.003; OR: 0.020; 95% CI: 0.002-0.227) and RR (p-value: 0.035; OR: 0.056; 95% CI: 0.004-0.821) when comparing treatment failure to being cured. For the age group 17-44 years, the results showed a p-value of 0.012 (OR: 0.158; 95% CI: 0.043-2.672), and for the 45-59 years age group, the p-value was 0.030 (OR: 0.197; 95% CI: 0.047-3.255).

Table 3. Bivariate analytic category Relapse Treatment

Variables	Treatment Resault								p-value (Kruskal-Wallis)
	Failure		Loss To Follow Up		Complete		Cured		
	N	%	n	%	n	%	n	%	
Gender:									
Male	13	5,8	34	15,2	19	8,5	79	35,4	0,726
Female	8	3,5	22	9,6	6	2,6	52	23,3	
Age Group :									
17-44 years	11	4,9	28	12,5	17	7,6	80	35,8	0,025*
45-59 years	8	3,5	21	9,4	7	3,1	48	21,5	
>60 years	2	0,8	7	3,1	1	0,4	3	1,3	
HIV Test :									
Negative	20	8,9	52	23,3	25	11,2	130	58,2	0,016*
Positive	1	0,4	4	1,7	0	0	1	0,4	
First Line Test :									
	6	2,6	17	7,6	8	3,5	48	21,5	0,724
	4	1,7	12	5,3	10	2	25	11,2	
	4	1,7	10	4,4	2	0,8	19	8,5	
	1	0,4	9	4,0	3	1,3	11	4,9	
	6	2,6	8	3,5	2	0,8	28	12,5	
Second Line *Test :*									
MDR	4	1,7	33	14,7	11	4,9	94	42,1	0,000*
RR-TB	3	1,3	11	4,9	8	3,5	25	11,2	
PRE-XDR	12	5,3	12	5,3	6	2,6	11	4,9	
XDR	2	0,8	0	0	0	0	1	0,4	

 DOI: https://doi.org/ 10.33533/jpm.v18i2.9445 Vol 18 No 2 (2024)

In the second-line sensitivity test for MDR, the results were significant with a p-value of 0.000 (OR: 3.500; 95% CI: 0.000-0.000) for loss to follow-up compared to being cured. The RR category also showed significance with a p-value of 0.000 (OR: 3.681; 95% CI: 0.000-0.000), and the Pre- XDR category had a p-value of 0.000 (OR: 7.517; 95% CI: 0.000-0.000).

Regarding treatment completion compared to cure, the second-line sensitivity test for MDR was significantly associated, with a p-value of 0.000 (OR: 2.885; 95% CI: 8.700-9.400). The RR category had a p-value of 0.000 (OR: 7.815; 95% CI: 2.100-2.700), and the Pre-XDR category showed a p-value of 0.000 (OR: 1.438; 95% CI: 1.400-1.400).

Table 6, shows a significant p-value <0.05 in the 1st line sensitivity test: MDR (p-value: 0.001; OR: 0.119; CI 95%: 0.003-0.227) to treatment failure rather than cure. In the 17-44 years age group (p-value: 0.010; OR: 0.232; CI 95%: 0.076-0.727) became Loss to follow-up rather than cured. Treatment complete was significantly associated with recovery in 17-44-year-olds (p-value: 0.000; OR: 6.800; CI 95%: 1.800-2.500, and 45-59-year-olds (p-value: 0.000; OR: 3.200; CI95%: 3.200-3.200).

Table 4. Bivariate analytic Failure treatment category 1 and 2

Variables	Treatment Resault								p-value (Kruskal-Wallis)
	Failure		LTFU		Complete		Cured		
	n	%	n	%	n	%	n	%	
Gender :									
Male	7	3,0	42	18,0	10	4,2	62	26,6	0,370
Female	8	3,4	32	13,7	6	2,5	66	28,3	
Age Group :									
17-44 years	8	3,4	31	13,3	13	5,5	82	35,1	**0,020***
45-59 years	6	2,5	33	14,1	3	1,2	40	17,1	
>60 years	1	0,4	10	4,2	0	0	6	2,5	
HIV Test :									
Negative	15	6,4	73	31,3	16	6,8	128	54,9	0,997
Positive	0	0	1	0,4	0	0	0	0	
TB Resistant Suspect:									
Failure Category 1	4	1,7	17	7,2	5	2,1	31	13,3	0,997
Failure Category 2	11	4,7	57	22,3	11	4,7	97	41,6	
First Line Test :									
HR	2	0,8	15	6,4	5	2,1	40	17,1	0,090
RR	1	0,4	12	5,1	2	0,8	9	3,8	
HRS	1	0,4	10	4,2	3	1,2	21	9,0	
HRE	3	1,2	25	10,7	3	1,2	26	11,1	
HERS	8	3,4	12	5,1	3	1,2	32	13,7	
Second Line *Test :*									
MDR	4	1,7	45	19,3	11	4,7	98	42	0,001*
RR-TB	1	0,4	10	4,2	2	0,8	6	2,5	
PRE-XDR	8	3,4	19	8,1	3	1,2	23	9,8	
XDR	2	0,8	0	0	0	0	1	0,4	

 DOI: https://doi.org/ 10.33533/jpm.v18i2.9445 Vol 18 No 2 (2024)

Table 5. Logistic Regression analytic category relapse

Outcome Treatment	Variables	B	p-value	OR	CI:95%
Failure	Age Group :				
	17-44 years	-1,066	0,316	0,344	0,043-2,672
	45-59 years	-0,936	0,386	0,392	0,047-3,255
	>60 years	-	-	-	-
	Second line test:				
	MDR	-3,888	0,003*	0,020	0,002-0,227
	RR-TB	-2,888	0,035*	0,056	0,004-0,821
	PRE-XDR	-0,748	0,567	0,474	0,037-6,112
	XDR	-	-	-	-
	HIV test :				
	Negative	-0,625	0,679	0,535	0,028-10,354
	Positive	-	-	-	
Loss To Follow Up	Age Group :				
	17-44 years	-1,846	0,012*	0,158	0,043-2,672
	45-59 years	-1,624	0,030*	0,197	0,047-3,255
	>60 years	-	-	-	-
	Second Line Test:				
	MDR	15,068	0,000*	3,500	0,000-0,000
	RR-TB	15,119	0,000*	3,681	0,000-0,000
	PRE-XDR	15,883	0,000*	7,517	0,000-0,000
	XDR	-	-	-	-
	HIV test :				
	Negative	-2,040	0,080	0,535	0,013-1,218
	Positive	-	-	-	
Complete	Age Group :				
	17-44 years	-0,106	0,924	0,900	0,084-9,661
	45-59 years	-0,521	0,930	0,606	0,053-6,953
	>60 years	-	-	-	-
	Second line Test :				
	MDR	14,875	0,000*	2,885	8,700-9,400
	RR-TB	15,872	0,000*	7,815	2,100-2,700
	PRE-XDR	16,482	0,000*	1,438	1,400-1,400
	XDR	-	-	-	-
	HIV test :				
	Negative	10,535	0,970	2,016	7,060-7,060
	Positive	-	-	-	

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Table 6. Logistic regression Analytic Failure treatment

Outcome Treatment	Variables	B	p-value	OR	CI:95%
Failure	**Age Group :**				
	17-44 years	-0,561	0,636	0,571	0,056-5,825
	45-59 years	-0,451	0,711	0,637	0,059-6,919
	>60 years	0			
	Second line Test :				
	MDR	-2,128	0,001*	0,119	0,003-0,227
	RR-TB	-2,888	0,538*	0,050	0,004-0,821
	PRE-XDR	0			
Loss To Follow Up	**Age Group :**				
	17-44 years	-1,459	0,010*	0,232	0,076-0,727
	45-59 years	-0,691	0,232	0,501	0,161-1,555
	>60 years	0			
	Second Line Test :				
	MDR	-0,486	0,188	0,612	0,298-1,267
	RR-TB	0,853	0,171	2,346	0,693-7,943
	PRE-XDR	0			
Complete	**Age Group :**				
	17-44 years	18,045	0,000*	6,800	1,800-2,500
	45-59 years	17,295	0,000*	3,200	3,200-3,200
	>60 years	0			
	Second Line Tes :				
	MDR	-0,486	0,726	0,728	0,199-3,077
	RR-TB	0,853	0,439	2,223	0,294-16,791
	PRE-XDR	0			

DISCUSSION

The characteristics of relapse categories and category 1 and 2 treatment failures overpowered by male sufferers greater than women with an age range of 17-44 years not influenced by HIV status. The sensitivity tests, both 1 and 2, confirmed the diagnosis of MDR-TB/RR. This finding aligns with the World Health Organization's 2023 report and the study by Zong et al. (2018), which indicated that male sufferers aged 25-44 years exhibit a higher rate of recurrence after more than two years of initial treatment compared to those with less than two years between treatments.[9]

Neesha et al. (2016) highlighted the lack of research on biomarkers to predict treatment failure and relapse in MDR-TB. They also emphasized the importance of disease severity scores to screen patients, prioritize intensive treatment, and address the high variability in immune responses influenced by both host factors and geographical differences.[12] control of the resistant drugs epidemic and reduce transmission in the patient's environment. Wollenberg et al. (2020) analyzed an outbreak of drug-resistant TB in Moldova, noting that gene diversity, evolution, and epidemiology play significant roles in determining the status of recurrent infections. Their study found that patients are often reinfected with strains similar to or different from the initial infection, emphasizing the need for strict follow-up and control measures to reduce transmission.[14]

In our study, relapse significantly affected treatment outcomes, particularly in the second-line sensitization test for MDR-TB/RR, leading to treatment failure, loss to follow-up, and incomplete treatment. The age group of

 DOI: https://doi.org/ 10.33533/jpm.v18i2.9445 Vol 18 No 2 (2024)

17-59 years was notably at risk of treatment dropout. Previous research has reported early resistance in DST results, where healthcare providers might not be aware of acquired resistance, often due to persistent positive cultures. This lack of awareness can result in regimen failure, highlighting the importance of performing and repeating DST routinely throughout therapy.[15] Effective standard treatment for newly diagnosed MDR-TB patients is crucial for rapid health improvement and stabilization.[16]

Another factor in treatment failure is a focus on prevention and early diagnosis.[17] For example, in Balikpapan City, MDR-TB / TB RR cases are predominantly caused by relapse in women aged 35-44 years with poor nutritional status. Strategies like counselling, disease education, and treatment support are essential to reduce dropout rates and treatment failure.[18]

In contrast, in London, a phenomenon was observed in relapse and reinfection cases of tuberculosis (TB). Relapse cases are found in patients with a previous TB treatment history of less than one year, who are infected with a non-clustered strain of Mycobacterium tuberculosis. These cases involve diseases located in the pulmonary or extra-pulmonary regions and are not identified during contact tracing. In contrast, reinfection cases involve patients previously diagnosed with TB, with age and sex distributions similar to those of all TB cases. Patients with a previous TB diagnosis tend to have higher rates of resistance to one or more first-line drugs compared to those without a previous diagnosis. Relapse or reinfection is observed in more than 10% of patients infected with multidrug-resistant (MDR) strains. Host susceptibility factors, such as stress, poverty, and social risk factors like homelessness, imprisonment, and old age, contribute significantly to relapse. Of the MDR TB cases with a history of previous TB, 48% are due to reinfection, while relapses account for only 18%.[19]

In the study, treatment failure categories 1 and 2 were associated with treatment failure due to multidrug-resistant TB (MDR-TB) in sensitivity test 1. Age groups 17-44 were significantly related to loss to follow-up, and ages between 17-59 years were influenced by treatment completion status. Wuhan Province, China, reported suboptimal treatment success rates among patients with MDR-TB and extensively drug-resistant TB (XDR-TB), as well as high treatment dropout rates. Predictor factors affecting patients with MDR-TB and XDR-TB included resistance to ofloxacin and kanamycin as independent predictors of treatment failure. Loss to follow-up was higher in MDR-TB patients compared to those with XDR-TB.[20] In Yemen, factors contributing to unsuccessful treatment (failure and loss to follow-up) among MDR-TB patients included 1-4 resistance to first-line oral anti-TB drugs (OAT), a baseline body weight of ≤40 kg, comorbidities, low economic status, a history of previously treated TB, and a family history of MDR-TB.[21]

In contrast, the results of both studies were not influenced by age, gender, or occupation in the treatment of MDR/XDR-TB. TB treatment involves antibiotics over several months, during which immune responses affect both the host and the pathogen. Using potential host and pathogen biomarkers to monitor treatment response in active and latent TB/MDR-TB patients allows for the evaluation of interventions, providing early warnings for outbreaks and new strains.[22,23]

Factors associated with delay (between eligibility for DST and initiation of treatment among bacteriologically confirmed MDR-TB patients enrolled for treatment were significantly against age 45-64 years and over 65 years with criteria of suspected MDR-TB relapse and use of after failure of category one regimen or category two regimen and outcome effected on the treatment outcome of MDR/XDR TB.[24] Study in Taiwan, the age and gender, patients infected with FQ- resistant strains were significantly more likely to fail treatment, Re-treatment cases were significantly against lost to follow-up.[25] In contrast to the opinion of Khan Imran and others that the males, and an initial body weight of less than 40 kg to lose to follow-up,

 DOI: https://doi.org/ 10.33533/jpm.v18i2.9445 Vol 18 No 2 (2024)

there are no significant factors in multivariate analysis.[26] MDR/RR TB and XDR TB patients have a higher risk of resistance in young age groups, unmarried, smokers, a history of previous treatment, especially those who have experienced failed treatment to high risk of influencing treatment outcomes.[27] Poor treatment outcomes were associated with the male gender and a smoking habit, comorbid or HIV status, so the rate of unsuccessful treatment outcomes is high due to the high rate of patients who stop treatment before completion (34.6%) and treatment failure (6.7%).[28,29] Women have a higher treatment success rate than men under 30 years of age, but the treatment outcome of relapse cases and patients who are re-treated after previous failure is less than 12%. Many risk factors and socially adaptive patients affect the treatment success rate.[30]

CONCLUSION

The results of the second sensitivity test in patients with relapse and treatment failure categories one or two could potentially impact treatment decisions. This consideration is assessing suspected MDR TB at the healthcare level. It focuses on the extent to which these criteria contribute to improving the management of drug-sensitive TB and to monitor the reporting of relapse cases and treatment failures promptly for evaluation. Additionally, there is a need to enhance services and standard operating procedures, as these can play a role in reducing the transmission of MDR TB reinfection cases involving the same bacteria or new strains in the community.

ACKNOWLEDGMENT

We express gratitude to the Indonesian Ministry of Health's director of Infectious Disease Control for allowing me to execute this search.

DECLARATIONS

Patient consent in this study was taken during the home visit.

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