Qamarul Huda Journal of Pharmacology
Vol. 1, No.2, Mei 2026, pp. 1-4 ISSN : 3123-982X

Evaluation Of Drug-Related Problems In The Category Of Drug Interactions In Tuberculosis Treatment Among Outpatients At Teratak Public Health Center

Supiani Rahayu[1)], Aya Shaufia Itsnayain[2)], Khaeditama Purnama[3)], Mira Oktawina[4*)]
miraoktawina@gmail.com : [4]
[1,2,3,4)]Department of Pharmacy, Faculty of Health, University of Qamarul Huda Badaruddin Bagu, Indonesia

ABSTRACT

Tuberculosis (TB) remains a major global health problem, including in Indonesia, due to its high incidence and mortality. The concomitant use of anti tuberculosis drugs (ATDs) with medications for comorbidities may cause Drug Related Problems (DRPs), particularly drug interactions, which can affect treatment effectiveness and safety. This study aimed to evaluate drug interaction related DRPs among TB outpatients at Teratak Public Health Center. A non experimental descriptive quantitative study with a retrospective approach was conducted using medical records of TB patients from January to December 2024. Samples were selected by total sampling, and drug interactions were identified using DrugBank and Drugs.com. Most patients were male (69.2%), with the highest proportion in the early elderly, late elderly, and geriatric groups (19.2% each). Eight potential drug interactions between ATDs and non ATDs were identified. Most interactions were classified as minor (50.0%), followed by moderate (40.0%) and major (10.0%). The major interaction involved rifampicin and amlodipine, which may reduce antihypertensive effectiveness. Overall, drug interactions were predominantly low severity. Regular monitoring and evaluation by healthcare professionals are recommended, especially for patients with comorbidities, to maintain therapeutic effectiveness and minimize adverse drug reactions.

Keywords: Tuberculosis, Drug-Related Problems, Teratak Public Health Center.

1. BACKGROUND

Tuberculosis remains one of the leading causes of morbidity and mortality worldwide. Indonesia is among the top three countries with the highest TB burden (WHO, 2022). TB treatment requires a combination of ATDs, but comorbidities often necessitate the use of additional non-ATD drugs, increasing the risk of drug interactions (Syamsudin, 2011). These interactions may reduce therapeutic effectiveness or increase adverse effects, resulting in DRPs (Amal, 2021). Therefore, evaluating drug interactions among TB patients is essential in primary care settings such as public health centers.

In addition, TB remains a major public health concern in primary care facilities, particularly in rural areas such as Teratak. Limited resources, coupled with the need for long-term multidrug therapy, increase the likelihood of medication errors, poor adherence, and

drug-related problems. Evaluating drug interactions in such settings is therefore essential to ensure treatment success, minimize adverse events, and support the role of pharmacists and healthcare workers in comprehensive TB management.

2. RESEARCH METHODS

This study employed a non-experimental retrospective descriptive quantitative design. The research was conducted at Teratak Public Health Center, Central Lombok, West Nusa Tenggara. The population consisted of all tuberculosis (TB) outpatients during the period of January to December 2024, with a total sample of 26 patients selected through total sampling. The research instruments included patient medical records and medication lists obtained from the health center. Potential drug interactions were identified using DrugBank and Drugs.com, with additional reference to Tatro (2009). The collected data were analyzed descriptively using frequency distribution and percentage tables to present the findings.

3. RESULTS AND DISCUSSION

In total, 26 TB outpatients were included in this study, consisting predominantly of males with a considerable proportion of elderly patients. Demographic and clinical characteristics of the patients are summarized in Table 1 (gender) and Table 2 (age group), while the identified drug interactions are presented in Table 3. The overall distribution of gender and drug interaction severity is further visualized in Figures 1 and 2, providing a clearer understanding of the study population and interaction profiles. Additionally, the separation of demographic data by gender and age group highlights the need to consider both biological and social determinants in TB prevalence and outcomes.

Table 1
Patient Gender Characteristics

Gender	Frequency (n=26)	Percentage (%)
Male	18	69.2
Female	8	30.8

The results demonstrate the importance of examining demographic and clinical characteristics together with drug interaction severity among TB outpatients. Table 1 shows that the majority of patients were male, which is consistent with global and national TB data where men are disproportionately affected due to higher exposure to risk factors such as smoking, alcohol consumption, and occupational environments (WHO, 2022; Kementerian Kesehatan RI, 2022).

Table 2 Patient
Age Group Characteristics

Age Category	Age Range (years)	Number of Patients	Percentage (%)
Children	5 – 11	2	7.7
Late Adolescence	17 – 25	5	19.2
Early Adulthood	26 – 35	1	3.8
Late Adulthood	36 – 45	3	11.5
Early Elderly	46 – 55	5	19.2
Late Elderly	56 – 65	5	19.2
Very Elderly	> 65	5	19.2
Total		26	100

Table 2 highlights that early elderly, late elderly, and geriatric groups each represented a significant proportion of cases, emphasizing the vulnerability of older patients whose immune systems are declining and who often present with comorbidities (Amal, 2021). This trend suggests that advancing age not only increases the risk of TB infection but also complicates treatment

due to the higher probability of polypharmacy and chronic diseases such as diabetes or hypertension. Elderly patients are therefore at a greater risk of experiencing drug interactions, adverse drug reactions, and therapeutic failure if not closely monitored. These findings reinforce the need for age-specific strategies in TB management, including regular health assessments, dose adjustments, and comprehensive counseling to improve adherence and minimize complications.

Table 3
Drug Interaction Severity

Interaction Severity	Frequency	Percentage (%)
Minor	4	50.0
Moderate	3	40.0
Major	1	10.0

the distribution of drug interactions, with most cases classified as minor or moderate. However, the identification of a major interaction between rifampicin and amlodipine is clinically important, as rifampicin induces CYP450 enzymes that accelerate amlodipine metabolism, thereby reducing its antihypertensive efficacy (Tatro, 2009; Syamsudin, 2011). Together, these findings suggest that demographic risk factors and drug interaction profiles must be closely monitored to optimize TB therapy outcomes. The involvement of pharmacists in early detection, therapy monitoring, and patient education remains crucial to minimize risks and ensure treatment success.

4. CONCLUSION

Drug interactions among TB outpatients at Teratak PHC were predominantly minor to moderate. Nonetheless, the presence of a major interaction underscores the need for vigilant monitoring, especially for patients with comorbidities.

5. THANKS

The author would like to express sincere gratitude to the supervisors, lecturers, and staff at the Faculty of Health, University of Qamarul Huda Badaruddin Bagu, as well as the healthcare workers at Teratak Public Health Center for their valuable support and guidance during the completion of this study. Special thanks are also extended to family and colleagues who provided continuous encouragement and assistance throughout the research process.

BIBLIOGRAPHY

[1] Amal, A. (2021). *Drug-related problems in infectious disease therapy*. Jakarta: EGC.
(2) Kementerian Kesehatan Republik Indonesia. (2022). *Indonesia TB situation report*. Jakarta: Kemenkes RI.
(3) Syamsudin, S. (2011). *Drug interactions and their impact on therapy*. Yogyakarta: Gadjah Mada University Press.
(4) Tatro, D. (2018). *Drug interaction facts*. St. Louis, MO: Wolters Kluwer Health.
(5) World Health Organization. (2022). *Global tuberculosis report*. Geneva: World Health Organization.
(6) Khutsiyah, L. (2018). *Potential drug interactions in outpatient pulmonary tuberculosis patients at Dr. Soegiri Lamongan Hospital in 2017* [Undergraduate thesis, UIN Maulana Malik Ibrahim Malang].
(7) Khotimah, K., & Sutrisna, E. M. (2023). Identification of drug-related problems (DRPs) in intensive phase tuberculosis treatment among geriatric patients at Surakarta General Hospital. *Medical Sains: Jurnal Ilmiah Kefarmasian, 8*(3), 945–953.
(8) Lestari, D. F. (2021). Analysis of potential drug–drug interactions in drug-resistant tuberculosis patients at Tangerang Selatan General Hospital during 2019–2021. *Jurnal Ilmu Kefarmasian Indonesia, 19*(2), 155–163. https://doi.org/10.22435/jifi.v19i2.5372
(9) Manson, G. C., & Zumla, A. I. (Eds.). (2008). *Manson's tropical diseases* (22nd ed.). Saunders Elsevier.
(10) Utami, S., Athiyah, U., & Nita, Y. (2022). Signal detection of adverse drug reaction

to first-line anti-tuberculosis drugs using the Indonesian pharmacovigilance database. *Pharmacy Education, 22*(2), 270–274. https://doi.org/10.46542/pe.2022.222.270274

(11) Veryanti, P. R., Ni, P. K. D., & Dian, P. (2019). Potential drug interactions of anti-tuberculosis drugs in the inpatient installation of X General Hospital Jakarta during 2016. *Sainstech Farma (SFJ): Jurnal Ilmu Kefarmasian, 12*(1), 23–31.

(12) Yasuda, S., Horai, Y., Tomono, Y., Nakai, D., & Yamato, C. (2002). The roles of CYP2D6 and stereoselectivity in the clinical pharmacokinetics of chlorpheniramine. *British Journal of Clinical Pharmacology, 53*(5), 519–525.