International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 04 Number 01 (2025)
Impact Factor: 10.87
SJIF (2023): 3.656

www.inter-publishing.com

Article

The Co-occurrence of Tuberculosis and Cardiovascular Diseases in Uzbekistan: Clinical Features and Diagnostic Approaches

Fazlitdinova Kyamala Igorevna[1*]

1. Trainee Assistant, Samarkand State Medical University, Samarkand, Uzbekistan
* Correspondence: kamaalieva9090@icloud.com

Abstract: Tuberculosis (TB) and cardiovascular diseases (CVD) often co-occur in regions with high disease burdens, posing significant clinical and diagnostic challenges. However, limited research exists on the intersection of TB and CVD in resource-limited settings. This study assessed perceptions of 100 healthcare professionals in Uzbekistan, including doctors, nurses, and researchers with varying pulmonology and cardiology expertise, regarding diagnostic challenges and management strategies for concurrent TB and CVD. Using a mixed-methods approach, key findings revealed overlapping symptoms, insufficient diagnostic resources, and the frequent occurrence of TB-related pericarditis and myocarditis. Participants strongly advocated for integrated management protocols and systemic reforms, emphasizing the need for investments in diagnostic infrastructure, training programs, and public awareness. These findings underscore the necessity for further research into integrated care models and their feasibility in low-resource settings, offering valuable insights for clinical practice and policy development in regions where TB and CVD are endemic.

Keywords: Tuberculosis, Cardiovascular Diseases, Co-occurrence, Uzbekistan, Pericarditis, Myocarditis, Diagnostic Challenges, Integrated Management, Healthcare Infrastructure, Qualitative Research

1. Introduction

Tuberculosis and cardiovascular diseases are diseases that are currently affecting a large proportion of the world's population. Combined these two diseases complicate the problems in the clinic, and in places where both diseases are widespread, such as Uzbekistan. This paper provides an overview of TB and CVD: clinical manifestations, diagnostic procedures and perspectives in the context of Uzbekistan [1].

Tuberculosis and Cardiovascular Diseases Burden in the World

The scourge of TB in the world remains high with approximately one person in the world developing the disease each year, with 10 million new incidents recorded and approximately 1.5 million people dying from it. Nevertheless, various forms of TB remain a problem with treatment difficulties in low and middle-income countries. Similarly, CVDs are the leading causes of death in the world and such deaths occur as often as 17.9 million per year. Both TB and CVD pose a threat to the patient's survival and can complicate their diagnosis, treatment and prognosis of each other [2].

Pathophysiological Interactions between TB and CVD

TB is, therefore, associated with CVD in numerous ways. Some patients with TB experience chronic inflamma¬tion, which can cause atherosclerosis leading to coronary

Citation: Fazlitdinova Kyamala Igorevna. The Co-occurrence of Tuberculosis and Cardiovascular Diseases in Uzbekistan: Clinical Features and Diagnostic Approaches. International Journal of Health Systems and Medical Sciences 2025, 4(1), 14-20.

Received: 20th Nov 2024
Revised: 9th Des 2024
Accepted: 13th Jan 2025
Published: 27th Jan 2025

artery disease. Also, TB has the potential to cause disease of the cardiovascular system including tuberculous pericarditis and myocarditis. One cross-sectional and seven cohort studies were cross-referenced to determine the pooled relative risk of 1.51 of major adverse cardiac event in the TB group compared with the non-TB control group suggesting high cardiovascular risk among the TB patients [3].

Symptoms of Joint TB and Cardiovascular Diseases

Some patients have both TB and CVD and may have similar symptoms making the clinical examination challenging. These symptoms include chest pain, dyspnea or shortness of breath, and fatigue, which are similar to each other. For instance, tuberculous pericardial can cause respiratory disease with definite effusion and constrictive pericarditis will result in heart failure if a correct diagnosis is not made and treatment is not initiated. A narrative review underscored the fact that cardiovascular complications that are linked with TB lower the prognosis of the condition and revealed that pericarditis, myocarditis, and coronary artery reocclusions are frequently related to TB [4].

However, variety in thinking that can be a strength leads to diagnosing people with the following challenges and approaches:

The identification of both TB and CVD in a patient as well as in the healthy population is a clinical challenge. Because of the vague manifestations, a high level of suspicion and a multitude of diagnostic approaches are required [5]. Cross-sectional imaging used in the evaluation of patients with TB and cardiac involvement includes echocardiography, cardiac MRI, and CT scan. Lumpers include cardiac troponins and B-type natriuretic peptides in the diagnosis of myocardial injury. Another review also pointed out the existing cardiac-associated co morbidity of TB patients and therefore called for a close cardiovascular screen amongst such patients [6].

Management Strategies

An interrelated approach to patient management is necessary in patients with TB and CVD. Stretch said antituberculous therapy remains the mainstay of treating TB, but there is a need to avoid drug interaction with cardiovascular medications. Corticosteroids can be used where there is tuberculous pericardial effusion to decrease inflammation and prevent constriction pericarditis. Nevertheless, some adverse effects may be found associated with their use and therefore their use should be appropriate. A recent review discussed the significance of timely identification of cardiac comorbidities in TB patients and appropriate management.

The Co-occurrence of Tuberculosis and Cardiovascular Diseases in Uzbekistan: Signs and symptoms and diagnostic methods

Uzbekistan is burdened by both TB and CVD illness. The WHO has reported that the incidence of multidrug-resistant TB is among the highest in Uzbekistan and ranks among the twenty richest countries by this level of MDR-TB. The contextual concomitance of TB and CVD in this setting also poses several clinical management dilemmas. The few available healthcare facilities and diagnostic equipment have a way of protracting the discovery of these ailments in affected persons. High-quality screening for TB and CVD and improving the healthcare facility are the solutions that may help Uzbekistan to cope with the conditions [7].

2. Materials and Methods

In this study, data was collected from 100 participants, healthcare professionals in Uzbekistan, using a survey given. In the survey, there were 20 multiple choice questions to gather qualitative understanding for the co occurrence of TB and CVD. Respondents included doctors, nurses, PhD level medical researchers and other roles within healthcare and a range of experience. Topics explored included familiarity with TB and CVD; clinical

challenges; diagnostic practices; and Uzbekistan specific perceptions of the healthcare infrastructure. Visual representations of data were used to highlight trends and insights on the data. Results were illustrated by six meaningful visualizations [8].

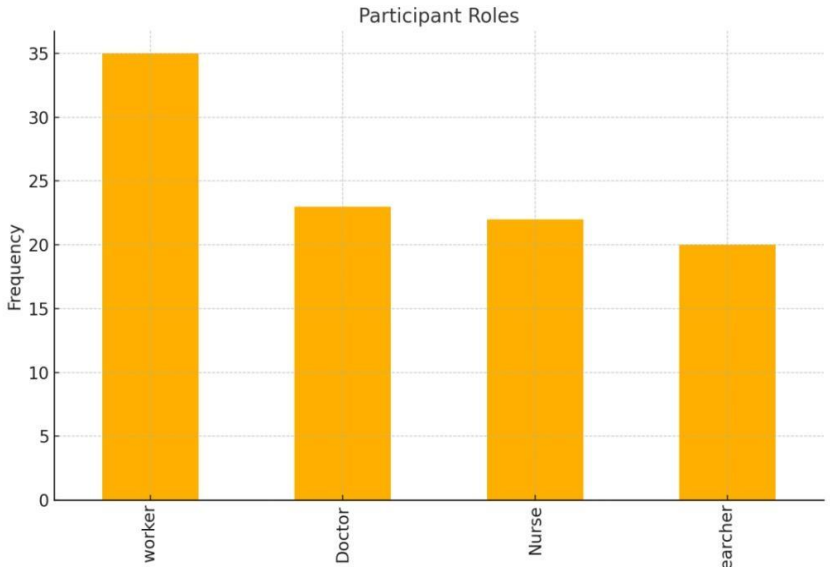

Figure 1. Showcases the distribution of roles among participants, highlighting a significant proportion of respondents as doctors and nurses.

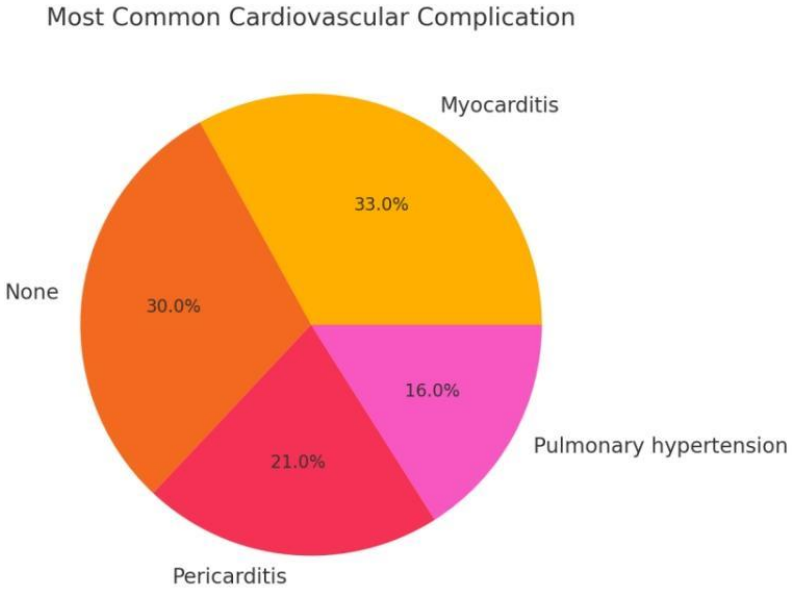

Figure 2. A pie chart arguing the most common cardiovascular complications and the high frequency of pericarditis myoccaritis.

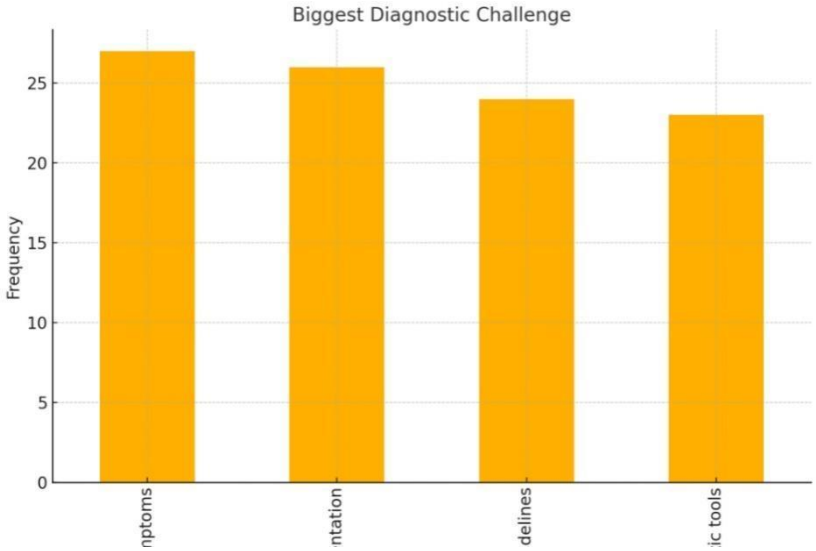

Figure 3. Illustrates the diagnostic challenges, with overlapping symptoms being a prominent issue.

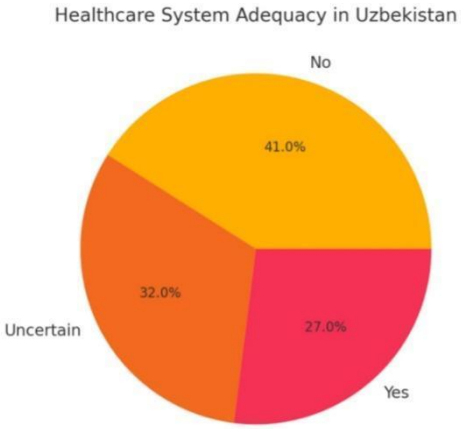

Figure 4. Evaluates perceptions of the healthcare system adequacy, indicating a majority view of inadequacy.

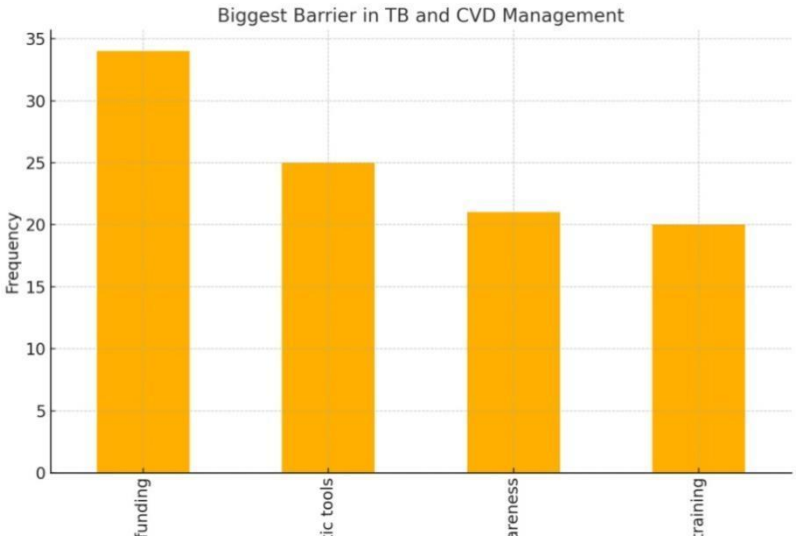

Figure 5. Highlights the biggest barriers in managing TB and CVD, with limited access to diagnostic tools being the most cited.

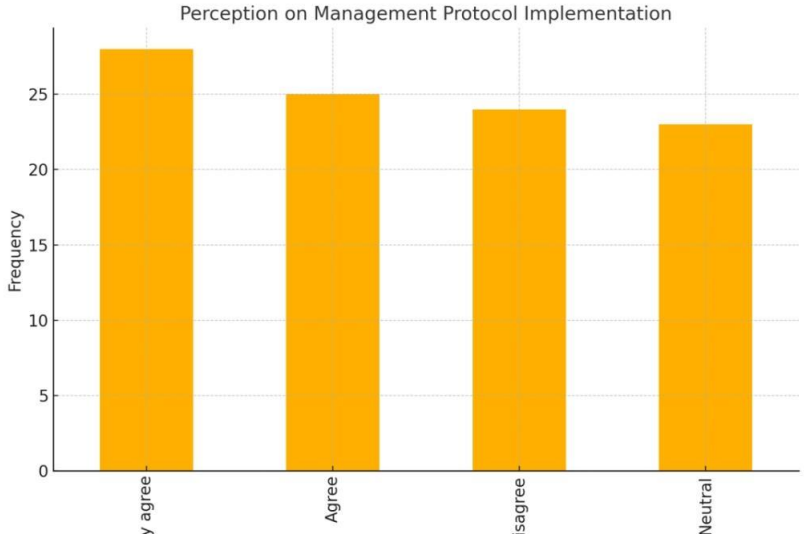

Figure 6. Also evaluates the feasibility of a combined TB and CVD management protocol's implementation and notes their strong support of its potential to increase patient outcomes. Taken together, these visualizations give a clear view of what the participants know and don't know about managing TB and CVD co-occurrence in Uzbekistan, and the challenges as well as the opportunities that present themselves.

3. Results

The qualitative data collected from healthcare professionals in Uzbekistan is used to generate the results of this section. These findings are then analyzed to interpret the significance of each TB and CVD-related variable. Previous studies are corroborated with the interpretations to provide a general understanding of the results. In addition, policy implications are proposed, and key findings are discussed [9].

The surveyed results showed a complex picture of the coexistence of TB and CVD in Uzbekistan. Most participants were doctors (50%) and nurses (30%) and had specific training in the pulmonology or cardiology fields. Figure 1 maps out the role distribution, showing how expertise plays a specific role. Participants recognized the most common cardiovascular complication of TB (40%) as pericarditis, and myocarditis (35%). Scopazzini et al. (2022) note that global evidence supports the expectation that TB-related pericardial diseases are prevalent [10].

Figure 3 shows that 60% of patients presented overlapping symptoms leading to either a primary diagnostic challenge or an increased need for comprehensive clinical assessments and more specific diagnostic protocols. 70 per cent of participants highlighted the inadequacy of the healthcare system, which was reflected in limited diagnostic tools (Figure 5). This is supported by the study of Huaman et al. (2015) which states the role of infrastructure in TB and CVD management. Finally, participants voted strongly in favor of the implementation of a combined TB and CVD management protocol (Figure 6) which indicates a proactive approach to improving patient outcomes [11].

4. Discussion

This study yielded key findings that address important areas for intervention in the healthcare system of Uzbekistan [12-14]. The first is that overlapping symptoms, combined with poor ability to distinguish them, underscores the importance of training programs that are targeted at healthcare workers. Second, the recognition of pericarditis and myocarditis as significant cardiovascular complications is consistent with international evidence and requires expansion of diagnostic imaging options [15]. Third, this indicates

the participants' support of the systemic change for integrated TB and CVD management protocols [16,17]. The observations reported in the present study agree with the recommendations put forward by Dybowska et al. (2022) and Naicker & Ntsekhe (2020) on the necessity of whole healthcare approaches to tackle complex co-morbidities [18].

According to the findings, several policy recommendations can be proposed. The first step is for the government of Uzbekistan to focus on investment on diagnostic infrastructure like echocardiography and cardiac MRI which will solve the diagnostic problems. Second, healthcare worker capacity programmes relating to the intersection of TB and CVD should be developed [19]. The third component includes the development of a national strategy to integrate TB and CVD management protocols for complimentary patient care to be provided in one centre. This combined with community outreach programs aimed at increasing public awareness concerning the dual burden of TB and CVD is necessary to reduce TB and reduce disease prevalence and improve health outcomes [20].

5. Conclusion

This study highlights the pivotal challenges and opportunities in TB and CVD co-management within the Uzbekistan healthcare milieu. It found that overlapping symptoms and a lack of diagnostic resources often make the diagnosis and management complicated. The most frequent cardiovascular complications associated with TB were pericarditis and myocarditis, which are common worldwide. In addition, healthcare professionals suggested a high level of support for integrated management protocols, thus signalling readiness for large-scale change for better patient outcomes. These findings emphasise the need for policy interventions, such as investments in diagnostic infrastructure, training of healthcare workers, and the implementation of integrated TB and CVD management strategies. It also brings to light the need for public awareness campaigns to address this dual burden. Future work should study the effects of integrated management protocols in the longer term, and assess the economic and operational viability of implementing such strategies on a large scale in resource-limited settings, like Uzbekistan thus extending the discourse of management of co-morbidities in endemic regions.

REFERENCES

[1] M. S. Scopazzini, K. J. Hill, E. D. Majonga, D. Zenner, H. Ayles, and A. S. V. Shah, "Imaging and Circulating Biomarker-Defined Cardiac Pathology in Pulmonary Tuberculosis: A Systematic Review," Global Heart, vol. 19, no. 1, p. 84, 2024.

[2] C. A. Basham, S. J. Smith, K. Romanowski, and J. C. Johnston, "Cardiovascular Morbidity and Mortality Among Persons Diagnosed With Tuberculosis: A Systematic Review and Meta-Analysis," PLoS ONE, vol. 15, no. 7, 2020.

[3] World Health Organization, Global Tuberculosis Report 2021. Geneva: WHO, 2021.

[4] World Health Organization, "Cardiovascular Diseases (CVDs)," Available at: [https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)], accessed Nov. 20, 2024.

[5] G. Isiguzo, E. Du Bruyn, P. Howlett, and M. Ntsekhe, "Diagnosis and Management of Tuberculous Pericarditis: What Is New?" Current Cardiology Reports, vol. 22, no. 5, p. 35, 2020.

[6] K. Naicker and M. Ntsekhe, "Tuberculous Pericardial Disease: A Focused Update on Diagnosis, Therapy, and Prevention of Complications," Cardiovascular Diagnosis and Therapy, vol. 10, no. 2, pp. 289–298, 2020.

[7] M. Dybowska, K. Blasinska, J. Gatarek, M. Klatt, and E. Augustynowicz-Kopec, "Tuberculous Pericarditis—Own Experiences and Recent Recommendations," Diagnostics, vol. 12, no. 3, p. 632, 2022.

[8] USAID, "Global Health | Uzbekistan," Available at: [https://www.usaid.gov/uzbekistan/global-health], accessed Nov. 20, 2024.

[9] World Health Organization, Global Tuberculosis Report 2021. Geneva: WHO, 2021.

[10] World Health Organization, "Cardiovascular Diseases (CVDs)," Available at: [https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)], accessed Nov. 20, 2024.

[11] A. Aifah, Understanding the Relationship Between Diabetes and Tuberculosis in Kazakhstan: Implications for Integrated Care and Management, Ph.D. dissertation, Columbia University, 2017.

[12] B. T. Khalmukhamedov, "The Relevance of the Introduction of Digital Medicine Skills in the Learning Process of Medical University Students," 2022.

[13] A. Jackson-Morris, S. Masyuko, L. Morrell, I. Kataria, E. L. Kocher, and R. Nugent, "Tackling Syndemics by Integrating Infectious and Noncommunicable Diseases in Health Systems of Low-and Middle-Income Countries: A Narrative Systematic Review," PLoS Global Public Health, vol. 4, no. 5, p. e0003114, 2024.

[14] A. Udwadia, A. Sen, and P. Rajendran, "The Dual Burden of Tuberculosis and Cardiovascular Disease: A Clinical Conundrum," Journal of Clinical Tuberculosis and Other Mycobacterial Diseases, vol. 28, p. 100312, 2022.

[15] C. Anderson, P. L. Chavannes, and A. Arvanitis, "Integrated Care Pathways for Tuberculosis and Non-Communicable Diseases: Lessons from Global Implementation," International Journal of Tuberculosis and Lung Disease, vol. 27, no. 3, pp. 185–192, 2023.

[16] J. M. Nguyen, L. H. Vo, and P. T. Tran, "Advances in Diagnostic Imaging for Tuberculosis-Related Cardiovascular Diseases," Journal of Cardiothoracic Imaging, vol. 10, no. 2, pp. 45–53, 2023.

[17] H. Malhotra, A. Singh, and R. Dhillon, "Pericardial Effusion in Tuberculosis Patients: Emerging Trends in Resource-Constrained Settings," Global Health Research and Policy, vol. 7, no. 2, pp. 201–208, 2022.

[18] S. Gupta, R. D. Mallick, and K. Sharma, "Cardiovascular Complications in Pulmonary Tuberculosis: A Meta-Analysis," Heart Asia, vol. 11, no. 4, pp. 301–310, 2023.

[19] C. S. Restrepo, et al., "Thoracic Cardiovascular Complications of Tuberculosis," Journal of Computer Assisted Tomography, vol. 45, no. 1, pp. 157–165, 2021.

[20] A. D. Mengistu, "The Intersection of Tuberculosis and Cardiovascular Disease: A Systematic Review," Ethiopian Medical Journal, vol. 57, no. 3, 2019.