INTERNATIONAL MULTI DISCIPLINARY JOURNAL FOR RESEARCH & DEVELOPMENT
eISSN 2394-6334 Impact factor: 7,854 Volume 12, issue 12 (2025)

UDC 616.711-002.5-053.8

CHANGES IN COAGULATION PARAMETERS IN PATIENTS WITH DESTRUCTIVE PULMONARY TUBERCULOSIS COMBINED WITH TUBERCULOUS SPONDYLITIS

Abdukarimov Mirzobek Ulugbekovich
Assistant of the Department of Phthisiology and Pulmonology
Bukhara State Medical Institute, PhD. Bukhara, Uzbekistan
mirzobek_abdukarimov@bsmi.uz
https://orcid.org/0009-0000-2048-7213

Abstract: The combined course of destructive pulmonary tuberculosis and tuberculous spondylitis is characterized by severe clinical manifestations, prolonged inflammatory activity, and a high risk of complications. Disorders of the hemostatic system play an important role in the progression of the disease and significantly affect treatment outcomes. This study aimed to evaluate changes in coagulation parameters in patients with destructive pulmonary tuberculosis complicated by tuberculous spondylitis. The results demonstrated pronounced alterations in the coagulation system, indicating a tendency toward hypercoagulation and increased risk of thrombotic complications. Regular assessment of coagulation parameters may improve disease monitoring and therapeutic strategies in this group of patients.
Keywords: destructive pulmonary tuberculosis, tuberculous spondylitis, coagulation system, coagulogram, D-dimer, fibrinogen.

Introduction

Tuberculosis remains one of the leading infectious diseases worldwide, posing a serious challenge to public health systems. Destructive pulmonary tuberculosis is associated with extensive lung tissue damage, cavity formation, and a severe clinical course. Among extrapulmonary forms, tuberculous spondylitis represents one of the most serious manifestations, often leading to long-term disability and significant deterioration in quality of life.

The coexistence of destructive pulmonary tuberculosis and tuberculous spondylitis reflects a generalized and prolonged infectious process. Such conditions are accompanied by intense inflammatory responses, tissue destruction, and systemic intoxication, which may profoundly affect the hemostatic system. Previous studies have shown that severe infectious and inflammatory diseases are frequently associated with coagulation abnormalities, including hypercoagulation, microthrombosis, and an increased risk of thromboembolic events.

Evaluation of coagulation parameters is therefore of great clinical importance, as it allows early identification of hemostatic imbalance, assessment of disease severity, and prevention of potentially life-threatening complications. However, data on coagulation changes in patients with combined pulmonary and spinal tuberculosis remain limited, which highlights the relevance of the present study.

Aim of the Study

To assess changes in coagulation parameters in patients with destructive pulmonary tuberculosis combined with tuberculous spondylitis and to determine their association with disease severity and risk of complications.

Materials and Methods

The study was conducted in 2023 at the Bukhara Regional Center of Phthisiology and Pulmonology. A total of 54 hospitalized patients with confirmed tuberculosis were included. Diagnosis was established based on clinical findings, laboratory tests, and radiological examinations.

Patients were divided into two groups:

- **Main group:** 31 patients with destructive pulmonary tuberculosis combined with tuberculous spondylitis
- **Control group:** 23 patients with destructive pulmonary tuberculosis without extrapulmonary involvement

Venous blood samples were collected from all patients to assess coagulation parameters, including:

- activated partial thromboplastin time (APTT),
- prothrombin index (PI),
- fibrinogen concentration,
- D-dimer levels.

Statistical analysis was performed using standard methods. Data were expressed as mean ± standard error (M±m). Differences between groups were considered statistically significant at **$p < 0.05$**.

Results

The analysis revealed significant alterations in coagulation parameters among patients in the main group compared with the control group.

The mean APTT in the main group was **44.1 ± 3.7 seconds**, which was significantly prolonged compared with **39.8 ± 2.9 seconds** in the control group ($p < 0.05$).

The prothrombin index was significantly lower in the main group (**72.6 ± 5.4%**) than in the control group (**79.3 ± 4.8%**, $p < 0.05$), indicating impaired coagulation function.

Fibrinogen levels were elevated in patients with combined pathology (**4.7 ± 0.5 g/L**) compared with patients with isolated pulmonary tuberculosis (**4.1 ± 0.4 g/L**, $p < 0.05$).

D-dimer concentrations were also significantly higher in the main group (**0.83 ± 0.2 µg/mL**) than in the control group (**0.59 ± 0.1 µg/mL**, $p < 0.01$), suggesting activation of coagulation and fibrinolysis processes.

Discussion

The findings of this study demonstrate that destructive pulmonary tuberculosis combined with tuberculous spondylitis is associated with pronounced disturbances in the hemostatic system. Prolonged inflammation, extensive tissue destruction, and systemic immune activation contribute to dysregulation of the coagulation cascade.

Elevated fibrinogen and D-dimer levels reflect an inflammatory-driven hypercoagulable state, which increases the risk of thrombosis and microcirculatory disorders. At the same time, prolongation of APTT and reduction of the prothrombin index may indicate exhaustion of compensatory mechanisms within the coagulation system.

These changes underline the necessity of regular monitoring of coagulation parameters in patients with severe and combined forms of tuberculosis. Early detection of hemostatic abnormalities may allow timely correction and reduce the incidence of thromboembolic complications.

Conclusion

Patients with destructive pulmonary tuberculosis combined with tuberculous spondylitis exhibit significant alterations in coagulation parameters. Prolongation of APTT, reduction of the prothrombin index, and increased levels of fibrinogen and D-dimer are associated with disease severity and an elevated risk of complications.

Routine assessment of coagulation markers should be considered an essential component of clinical management in this category of patients to improve prognosis and treatment outcomes.

REFERENCES

1. Abdukarimov M. U., Kh U. I. The study of the prognostic value of procalcitonin and changes in the blood coagulation system in the course of pulmonary tuberculosis //Journal of Survey in Fisheries Sciences. – 2023. – T. 10. – №. 1S. – C. 3217-3247.
2. Abdukarimov M. U., Usmonov I. K. Changes in the blood coagulation system in destructive tuberculosis //Central Asian Journal of Medicine. – 2024. – №. 3. – C. 111-117.
3. Abdukarimov M. U., Kh U. I. 67-7 (69) 2024-Abdukarimov MU, Usmonov I. Kh.-pathogenesis of the origin of destructive forms of pulmonary tuberculosis: review of scientific sources.
4. Usmonov I., Shukurov U. Features of the clinical course, the state of diagnosis and treatment of HIV-associated pulmonary tuberculosis in modern conditions literature review //Annals of the Romanian Society for Cell Biology. – 2021. – T. 25. – №. 4. – C. 1809-1828.
5. Usmonov I. K., Muazzamov B. R., Jumaev M. F. Features of Diagnostics and Treatment of Drug-Resistant Forms of Pulmonary Tuberculosis //International Journal of Pharmaceutical Research (09752366). – 2020. – T. 12. – №. 3.
6. Парпиева Н. Н. и др. Особенности диагностики и лечении при генерализированных формах туберкулёза //Новый день в медицине. Бухара,(2). – 2020. – С. 424-428.
7. Khaydarovich U. I., Khodgamovich N. P. Technique of use of titanium mesh cylinder of exemplary cage tubercular spondylitis //European science review. – 2018. – №. 9-10-2. – C. 178-184.
8. Назиров П. Х. и др. Преимущество и недостатки боковых хирургических доступов при радикально-восстановительных опeratsiях туберкулёзного спондилита поясничного и пояснично-крестцового отдела позвоночника //Новый день в медицине. – 2020. – №. 2. – С. 453-458.
9. Usmonov I. X., Iskandarova I. M. Xavfli o‘smalar va o‘pka tuberkulyozini davolashda klinik va diagnostik xususiyatlar hamda qiyinchiliklar //Журнал гуманитарных и естественных наук. – 2024. – №. 8. – С. 113-117.
10. Усмонов И. Х., Гобилов Н. Ю. Особенности лечения при генерализированных формах туберкулёза //Молодой ученый. – 2020. – №. 29. – С. 65-68.
11. Назиров П. Х., Усмонов И. Х., Зайиров М. Х. Состояние очагов туберкулезной инфекции в современных условиях //Вестник Ассоциatsii Пульмонологов Центральной Азии. – 2025. – Т. 14. – №. 9. – С. 362-366.
12. Усмонов И. Х. и др. Особенности пост лечебных морфологических изменений мульти резистентных формах туберкулёза легких и оценка его прогностической значимости //Ta'limning zamonaviy transformatsiyasi. – 2025. – Т. 19. – №. 1. – С. 202-206.
13. Аслонов Ф. И., Усмонов И. Х. Влияние гендерных и клинических факторов на исходы лечения туберкулёза: сравнительный анализ первичных и вторичных patsientов //International Conference on Modern Science and Scientific Studies. – 2025. – С. 51-53.
14. Усмонов И. Х., Умурова Д. О. Особенности клинического течения туберкулезного спондилита у больных с сердечной потологией //Наука и инноватsiя. – 2024. – Т. 2. – №. 32. – С. 62-64.
15. Ливерко И. В., Абдуганиева Э. А. Связь патогенетических механизмов развития инфаркта миокарда с хронической обструктивной болезнью легких: причины и факторы риска (обзор) //Georgian medical. – 2019. – С. 66.
16. Абдуганиева Э. А., Халмухаммедова С. М., Дадабаева Р. К. Влияние изменения образа жизни и характера питания на качество жизни patsientов с ХОБЛ //В сборнике: Особенности формирования здорового образа жизни: факторы и условия. – 2015.

17. Fatullayevich J. M. Biological characteristics of the causative agent of tuberculosis in patients with pulmonary tuberculosis //World Bulletin of Public Health. – 2021. – T. 5. – C. 27-32.
18. Jumayev M. F. Characteristics and shortcomings of clinical and medical diagnostics of pulmonary tuberculosis // Barqarorlik va Yetakchi Tadqiqotlar Online Scientific Journal. – 2022. – Vol. 2. – No. 10. – Pp. 367–372.