



RESEARCH

INFORMATION

The effect of type 2 diabetes mellitus (DM) on tuberculosis (TB) treatment outcomes



AIMS

- Tuberculosis (TB) is the world's deadliest infectious disease, killing one person every 20 seconds. The number of diabetes cases is expected to double in the next decade, affecting over 600 million people.
- The burden of TB and multimorbidity remains an important public health concern in the UK.
- This is a major concern as diabetes increases the risk of TB returning and raises the likelihood of death from TB.
- This research aims to understand why diabetic patients respond poorly to TB treatment. The goal is to develop effective, personalized treatment strategies to improve patient care.



KEY FINDINGS

- Diabetic patients take longer to absorb TB medication, meaning that these drugs take longer to reach effective levels in their bloodstream.
- Diabetic patients with TB clear the bacteria more slowly, indicating a delayed treatment response.
- Analysing data from over 5,000 TB patients confirmed that those with diabetes have worse treatment outcomes. This is the first high-quality study to confirm previous observational research.
- These findings suggest that diabetic patients with TB need tailored treatment plans, possibly requiring longer or adjusted medication dosages.





WHAT DID THE STUDY INVOLVE?

The research was conducted in three stages:

1. **Systematic Review:** Analysed published research to understand TB medication dosing for diabetic patients.
2. **Patient Study in Uganda:** Recruited TB patients in Kampala to examine how diabetes influences TB disease and treatment response.
3. **Data Analysis:** Used existing high-quality datasets to evaluate how diabetes affects TB treatment outcomes.

Throughout the study, the research team engaged with TB patients, community groups and TB patient groups in Kampala such as Friends Council. Patients helped shape the project by sharing their experiences and providing feedback on research design.

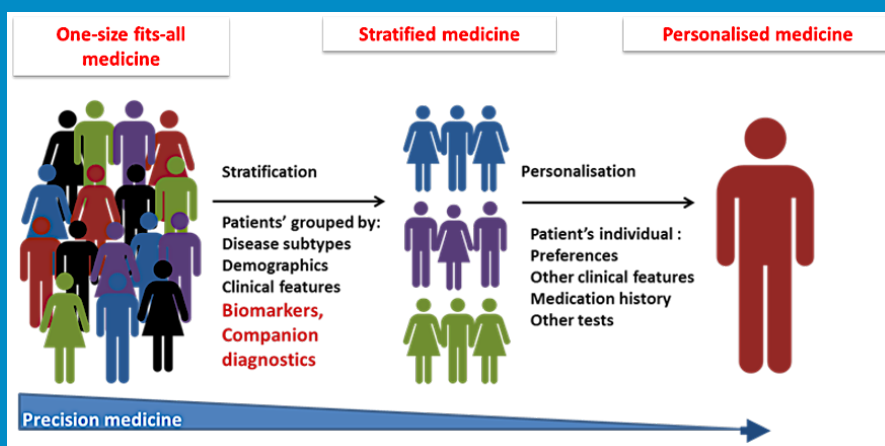


WHAT WERE THE RESULTS AND WHAT DO THEY MEAN?

- Diabetes complicates TB treatment, thereby increasing the burden on patients, families, and healthcare systems.
- According to the results of this research, TB medications take longer to reach effective levels in diabetic patients. This finding has contributed to discussions on revising TB drug dosage guidelines by the World Health Organization (WHO).
- In Uganda, 7% of TB patients were also diabetic. These patients had slower bacterial clearance, highlighting the need for personalized treatment approaches.
- The research will help inform community-based healthcare strategies and improve future drug development and host-directed therapies for TB

The findings strengthen Scotland's research capacity on interactions between infectious and chronic diseases, an important global health priority.

Precision medicine
Modern medicine often treats one health condition at a time, yet people usually face multiple health risks. By understanding how tuberculosis and diabetes interact at a biological level, we can develop more personalised and effective treatments for each person.





WHAT IMPACT COULD THE FINDINGS HAVE?

- **Patients and Families:** The findings will help improve TB care for diabetic patients by enabling more effective treatment. Personalised treatment strategies may reduce complications and improve recovery times, ultimately improving quality of life for patients and reducing the burden on their families.
- **Healthcare Professionals:** These insights will support the development of updated clinical guidelines, improve TB management in diabetic patients, and provide healthcare professionals with evidence-based strategies to enhance patient care.
- **Policymakers and NGOs:** The research offers critical evidence to inform national and international health policies. It will support integrating diabetes screening into TB programs, improve treatment protocols, and contribute to global efforts to combat TB. Additionally, the findings will support the development of community-based interventions that address the unique needs of patients with both TB and diabetes.



HOW WILL THE OUTCOMES BE DISSEMINATED?

- Major findings are published in open-access journals and shared through traditional and social media channels.
- Results have been presented at research events at the University of St Andrews, the University of Edinburgh, and the Infectious Diseases Institute in Uganda.
- Future presentations are planned for the Scottish Health Protection Network and the Ugandan Ministry of Health.
- A patient information leaflet summarising key findings will be distributed to study participants and community advisory boards.
- Insights from stakeholder discussions, including Uganda's National TB Program, will be compiled and shared with policymakers and nonprofit organisations.



CONCLUSION

- By understanding the biological mechanisms underlying the TB-DM interaction, we can develop effective, individually tailored interventions.
- The outcomes of this project and engagement work will inform the development of strategies and improved practices to enhance personalised care.



RESEARCH TEAM & CONTACT



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