

A Survey of Latent Tuberculosis Screening and Treatment Practices in a Tertiary Centre

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Abstract

Aim

Knowledge of latent tuberculosis infection (LTBI) screening and treatment practices are lacking in Ireland, where LTBI is not programmatically surveyed or managed. The aim of this research was to describe current clinical practice when screening and treating patients for LTBI in a tertiary referral centre in Ireland.

Methods

A 17-question survey relating to LTBI screening and management practices with both open-ended questions and close ended multiple-choice questions was created using SurveyMonkey. The survey target sample was healthcare workers in the tertiary centre who direct LTBI screening and treatment for patients at risk of TB disease in their respective departments.

Results

The response rate to the survey was 45% (21/47). Seventy-one percent (15/21) of those surveyed responded to the question "What barriers exist to screening patients for latent TB in your clinical practice?". Fifty-three percent (8/15) said that they found it difficult to access LTBI testing and 27% (4/15) cited accessing the interferon-gamma release assay (IGRA) result as a barrier. Forty-three percent (9/21) responded that there was not a clear referral pathway for patients that they would like specialist input on when diagnosing and managing patients with LTBI.

Conclusion

Access to LTBI testing, LTBI test results, TB specialist services and the use of rifamycin-based regimens should be improved in this tertiary centre. Consideration should be given to developing a national LTBI education programme for healthcare professionals and updating national LTBI treatment guidelines.

Introduction

Latent tuberculosis infection (LTBI) is a state of persistent immune response to stimulation by *Mycobacterium tuberculosis* (Mtb) antigens with no evidence of clinically manifest active disease.¹ It is estimated that 23% of the world's population has LTBI.² In the World Health Organisation (WHO) European Region, the estimated prevalence of LTBI is 13.7% (95% confidence interval (CI) 9.8-19.8). TB reactivation is most likely to occur within two years of infection and in Europe an estimated 0.2% to 0.3% of those with LTBI are recently acquired infections (within two years).² Of those with recent LTBI in the WHO European Region, 29.5% are infected with isoniazid resistant Mtb, the highest such proportion among any WHO region.² Assuming 0.15% of those latently infected develop TB disease, then the disease incidence among this population alone is estimated to be 16.5 cases per 100,000 population per year by 2035.² In countries with a low incidence of TB and established systems for contact tracing, like Ireland (incidence of 5.6 cases per 100,000 of population³), most TB disease is due to TB reactivation.^{2,4} The WHO Framework Towards Tuberculosis Elimination in Low Incidence Countries highlights the importance of systematic screening for LTBI in at-risk groups to achieve TB elimination (less than 1 case per million of population).⁵ People living with HIV, contacts of pulmonary TB cases, patients initiating anti-tumour necrosis α treatment, dialysis patients, patients preparing for organ transplantation and patients with silicosis should undergo systematic screening for and treatment of LTBI according to the WHO.⁵ Systematic screening and treatment of LTBI may also be considered for prisoners, health workers, migrants from countries with a high burden of TB, homeless people and people who use illicit drugs.⁵ However, the risk benefit of LTBI treatment will vary depending on the patient's risk of TB reactivation and risk of treatment-related adverse events. Knowing what current clinical practices are when screening and managing LTBI is important to understand how effectively LTBI care is being provided and how it could be improved. However, knowledge of LTBI screening and treatment practices is lacking in Ireland, where LTBI is not programmatically surveyed or managed. The aim of this research was to describe current practices when screening and treating patients for LTBI in a tertiary referral centre in Ireland.

Methods

A 17-question survey with both open-ended questions and close ended multiple-choice questions was created using SurveyMonkey (SurveyMonkey Inc., www.surveymonkey.com). The survey target sample was healthcare workers in the tertiary centre who direct LTBI screening and treatment in their respective departments for patients who, according to national guidelines, should be screened for LTBI.⁵ A list of hospital specialists, clinical nurse specialists and advanced nurse practitioners was drafted from the hospital internal directory and recorded in Microsoft Excel (Microsoft Corporation, 2018). The total number of entries in this excel spreadsheet defined the denominator of the survey response rate. The survey was disseminated via internal hospital email. The survey was sent a total of three times to all those on the list at two-weekly intervals. Responses were analysed using Microsoft Excel. Qualitative data were analysed and coded by author 1 according to the themes expressed in the responses. Ethical approval from the Royal College of Surgeons in Ireland Research Ethics Committee was received to perform this survey.

Results

The response rate to the survey was 45% (21/47) and included hospital specialists, clinical nurse specialists, advanced nurse practitioners and occupational health specialists. Figure 1 demonstrates that among the 20 respondents able to offer a response regarding patients on immunosuppressive treatment, 75% (15/20) said they frequently offered this cohort LTBI screening. Among the 15 respondents able to offer a response regarding recent TB case contacts, 73% (11/15) said they frequently offered this cohort LTBI screening. Regarding patients with silicosis, people living with HIV, people who are homeless and people in prisons, 62% (13/21), 48% (10/21), 43% (9/21) and 43% (9/21) of respondents, respectively, reported that they did not encounter this cohort often enough to answer. With regard to people from high TB incidence countries, only 50% (8/16) of respondents reported offering this cohort LTBI screening frequently.

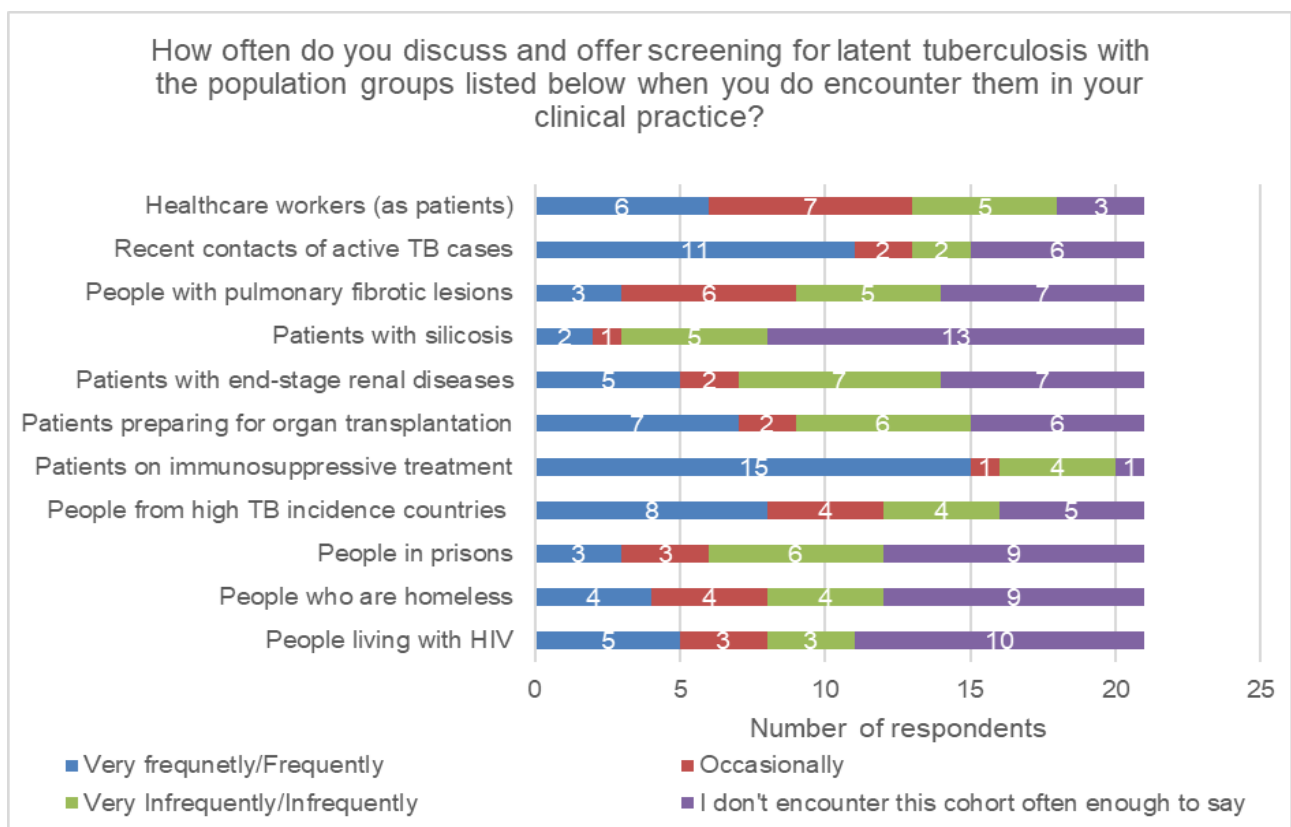


Figure 1: How often do you discuss and offer screening for latent tuberculosis with the population groups listed below when you do encounter them in your clinical practice?

Seventy-one percent (15/21) of those surveyed responded to the question “What barriers exist to screening patients for latent TB in your clinical practice?”. Fifty-three percent (8/15) said that they found it difficult to access LTBI testing. Respondents cited problems such as a lack of 2TU tuberculin skin tests (TST), lack of clinic space to read TSTs and for testing with interferon-gamma release assays (IGRA), barriers were sourcing and filling out order request forms, accessing phlebotomy to draw the sample, the frequency and location of sample processing and the time taken to request the test.

Difficulty accessing the IGRA test result was reported as a barrier by 27% (4/15) of respondents. A perception among healthcare workers of the risk of TB in at-risk cohorts being low was cited as a barrier by 20% (3/15). A lack of systems to identify all the target cohort for screening, a failure of patients to attend for screening when invited, and healthcare workers not knowing who to screen were each cited by 7% (1/15) of respondents as barriers to screening for LTBI.

Forty-five percent (9/20) of respondents said they did not have a guideline or protocol they followed when screening or managing LTBI. Among the 55% (11/20) that reported having a guideline or protocol, multiple were followed (American Thoracic Society/Infectious Diseases Society of America (2 respondents), Health Protection Surveillance Centre Guidelines on the Prevention and Control of Tuberculosis 2010 (1), Centre for Disease Control and Prevention (1), British Transplant Society (1), European Crohn’s and Colitis Organisation (2), British Thoracic Society (1), departmental protocol (3)). Risk factor assessment for TB, an assessment for active TB and an assessment for LTBI treatment contra-indications were performed frequently by most respondents (Figure 2). Pre-test counselling, however, was performed frequently by only 48% (10/21).

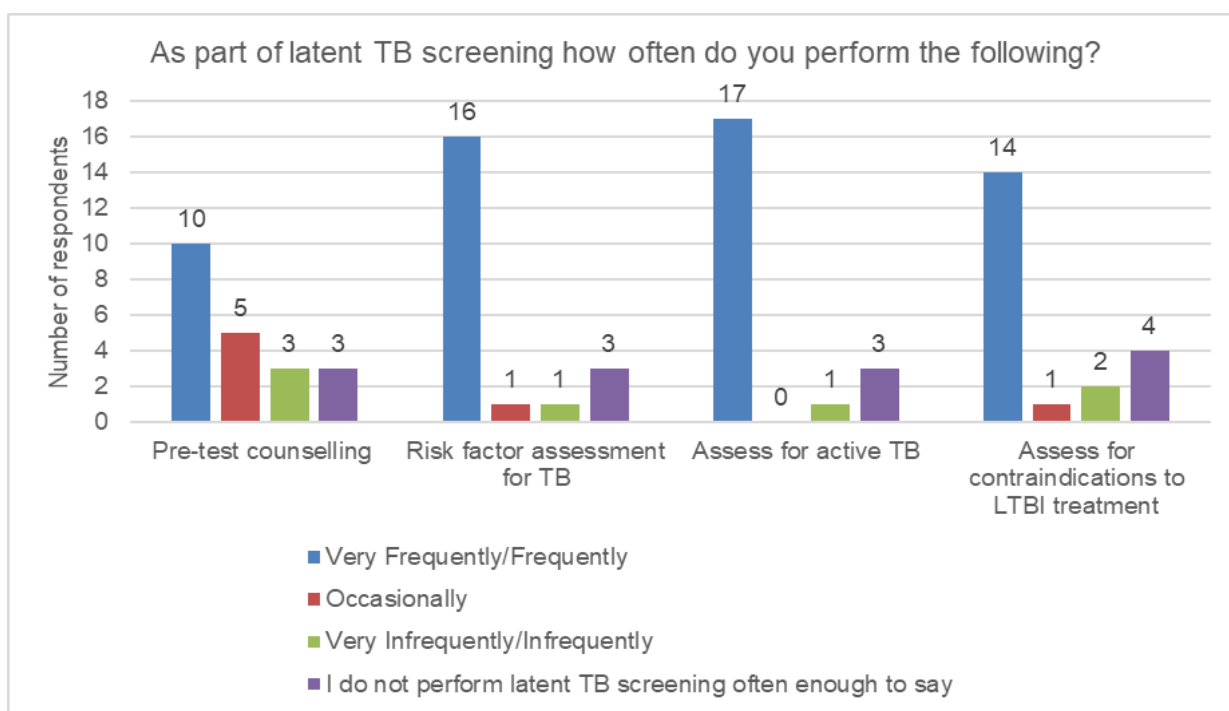


Figure 2: As part of latent TB screening how often do you perform the following?

Across all risk groups, IGRA was the screening test most frequently reported as being used by respondents (n=21) (Figure 3). Among healthcare workers, people with pulmonary fibrotic lesions, patients with silicosis, patients with end-stage renal diseases, patients preparing for organ transplantation, patients on immunosuppressive treatment, people in prisons and people who are homeless, IGRA was reported as being used with or without TST by all respondents. While IGRA remained the most frequently reported test used to screen people living with HIV, people from high TB incidence countries and recent case contacts for LTBI, in each of these cohorts, one respondent reported using TST alone.

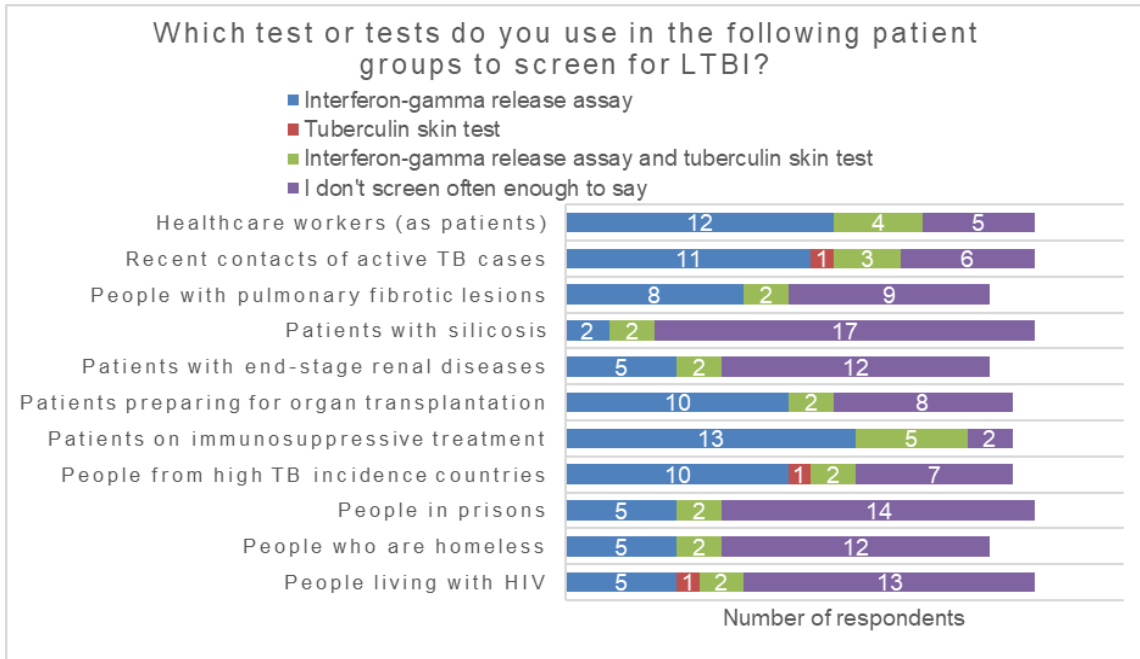


Figure 3: Which test or tests do you use in the following patient groups to screen for latent TB?

Most respondents (57% (12/21)) reported that they have treated patients for LTBI without referring to a TB specialist and 43% (9/21) reported that there was not a clear referral pathway for patients that they would like specialist input on when diagnosing and managing LTBI. If referring a patient for specialist TB review, 38% (8/21) of healthcare professionals surveyed would refer patients to the infectious diseases department and 33% (7/21) would refer patients to the respiratory medicine department.

Respondents strongly agreed or agreed that they were confident in their ability to perform LTBI screening (90% (19/21)), initiate LTBI treatment (50% (10/20)), monitor LTBI treatment (48% (10/21)) and manage complications of LTBI treatment (43% (9/21)) (Figure 4).

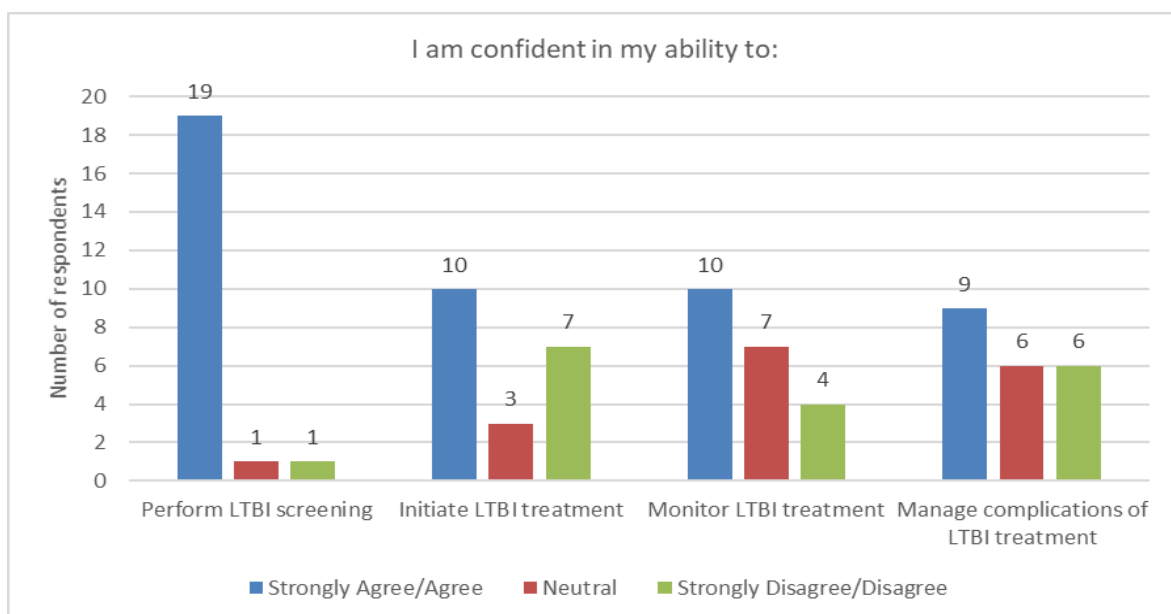


Figure 4: Respondents' self-perceived competency in LTBI care.

There were 13 respondents to the question of what LTBI regime they usually prescribe when they do treat LTBI, 62% (8/13) prescribed Isoniazid for either six or nine months, 23% (3/13) prescribed rifampicin and isoniazid for three months and 15% (2/13) prescribed rifampicin monotherapy for four months.

Discussion

This research describes LTBI screening and treatment practices among healthcare professionals who direct such care for patients at risk of TB disease. The main findings were that patients on immunosuppressive treatment and TB case contacts were those most often reported as being offered LTBI screening frequently, but only 50% of those surveyed reported offering people from countries with a high incidence of TB screening frequently. Barriers to LTBI screening identified were primarily logistical (difficulties accessing testing and retrieving results), but also a lack of knowledge because at-risk patients were reportedly perceived by healthcare professionals to be low risk for TB disease. This research has identified areas where clinical practice could be improved, namely the performance of pre-test counselling when screening for LTBI, monitoring patients on LTBI treatment, managing the complications of LTBI treatment and reducing the use of isoniazid monotherapy as the first-choice treatment regimen. Deficits in the processes of LTBI care were the reported lack of a clear referral pathway, and the large proportion of respondents (45%) who reported that there was no guideline or protocol which they followed when screening for LTBI.

Based on the identified barriers, areas for clinical practice improvement, and deficits in care processes, recommendations for quality improvement can be made. The process of quality improvement may be pursued in isolation at a local level, but this may be challenging for healthcare providers if multiple simultaneous quality improvement initiatives are pursued, dividing their time and efforts.⁷ Many deficits in quality in TB care are a result of system-wide problems that may be better solved at a system level rather than a local level.⁷ Therefore, recommendations arising from this research may have both local and national relevance.

The logistical barriers to LTBI screening identified should be resolved at a local level within the hospital. Removing such barriers identified will be important to scale up effective LTBI screening. However, because these barriers are multifactorial, they will require engagement with multiple stakeholders, such as phlebotomists, laboratory personnel, information-technology technicians, and hospital managers at a local level.

The reported low perception of the risk of TB disease, low performance of pre-test counselling, and low confidence in performing aspects of LTBI treatment should be addressed. This could be done through a programme of LTBI education for healthcare professionals. This is recommended by the European Centre for Disease Prevention and Control and is a feature of other effective TB programmes such as that of the Netherlands.^{8,9} An LTBI education programme would be best established nationally rather than locally to maximise benefit from the resources expended in its development.

The referral pathway for accessing TB services locally should be improved. Although most respondents (57%) said they treated LTBI without referring to a TB specialist, only a minority agreed they were confident in monitoring treatment or managing complications. This suggests the need for a referral pathway is primarily for treatment rather than diagnostic purposes. When initiating treatment, a high proportion of respondents (62%) reported using isoniazid monotherapy. The use of newer rifamycin-based regimens should be encouraged where possible given the potential for isoniazid resistant LTBI and it is known they cost less, require fewer appointments, and have superior treatment adherence and completion rates.^{10,11,12} This could be done through the development and promotion of updated national guidance on LTBI treatment given the reported multiplicity of guidelines in use and, for many, the absence of a reference guideline or protocol.

A limitation of this study was the small sample size and low response rate, meaning response bias cannot be excluded. Although this survey targeted healthcare professionals who direct LTBI care among at-risk patients in their respective departments, practices among other healthcare professionals within their departments, such as trainees or general nursing staff, may differ. The single centre nature of this survey limits the generalisability of some of the findings. Primary care physicians, who are important in any population-based effort for systematic disease prevention and control, were not surveyed. Future research evaluating LTBI care practices in primary care will be important if a programmatic approach to LTBI is to be taken in Ireland.

In summary, effectively screening for and treating LTBI is key for countries with a low incidence of TB to achieve elimination by reducing the incidence of TB reactivation and secondary disease transmission. This research has identified opportunities and made recommendations to improve local and national LTBI screening and treatment.

Declaration of Conflicts of Interest:

The authors declare they have no conflicts of interest to declare.

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