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She is developing her scientific career in the National Center for Tuberculosis and Lung Diseases (NCTBLD) in Tbilisi, Georgia. Her research focuses on TB Contact investigation and latent and active tuberculosis among the contacts of TB patients. Currently she works as an Advocacy, Communication and Social Mobilization (ACSM) Advisor for USAID Georgia Tuberculosis Prevention Project

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ISID Grant Report

Contact Investigation for Tuberculosis in Georgia, Tbilisi (Pilot Project)

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Background

Investigating the contacts of patients with tuberculosis (TB) is a priority public health measure employed in high-income countries.1 TB contact investigation has typically been a low public health priority in most high TB incidence countries and in low and middle-income countries (LMIC).2,3

Georgia has a high burden of TB including MDR-TB disease.4,5 In 2012, the incidence rate of was 116 per 100,000 persons and approximately 9.2% of new cases and nearly a third of retreatment cases had MDR-TB.6 In the past, an "invitation" model of contact investigation was implemented: only contacts who presented to health care facilities in conjunction with an index TB case were investigated.7

In Georgia limited data exists regarding TB contact investigation. Previously published investigations of LTBI in Georgia have been conducted among Georgian healthcare workers and internally displaced persons (IDP).8,9

Specific Research Aims and Methods

The purpose of our study was to assess the utility of TB contact investigation.

The objectives included:

- To assess the utility of contact investigations in active TB case finding;
- To determine the prevalence of LTBI among TB contacts;
- To identify risk factors associated with LTBI and active TB disease among TB contacts.

Research Design and Methods

Study Design – A prospective observational study design was used.

Study Period – Study data for TB patients and their contacts were collected from September 2012 through November, 2013.

Study Location – The National Center for Tuberculosis and Lung Diseases (NCTBLD) in Tbilisi, Georgia.

Participants – The participants were index cases and their contacts.

Index cases and contacts were defined according the WHO recommendations.10 Eligible index cases for the study included patients with pulmonary MDR TB who registered in the NCTBLD from September, 2012 to November, 2013 and who brought in close contacts for investigation. Once contacted and asked to participate in the research study, index cases' medical records were reviewed and index cases were interviewed using a structured questionnaire. A list of contacts for each index case was developed. Eligible contacts for this study included any close contacts brought to the NCTBLD by an enrolled index patient. Contacts were approached, interviewed and evaluated for clinical symptoms by clinicians; chest radiography

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(CXR) and tuberculin skin tests (TST) were performed. Nurses at the NCTBLD performed TST on the contacts who agreed to be tested using the Mantoux method.11

Variables –The primary study outcomes were presence of secondary active TB cases and LTBI among contacts. Secondary TB cases were defined as active TB disease among contacts during the investigation.10 A contact with LTBI was defined as any contact person with a positive TST (an induration of five or more millimeters) who during baseline investigation.10,11,12

Statistical Methods –Data management and statistical analyses were conducted using SPSS v.19.0 (IBM, USA) and OpenEpi v.2.3.1 (Open source).

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Results

Between September 2012 and November 2013, 114 index TB patients brought in 393 contacts for investigation (Figure 1) at the NCTBLD; a median of 3 (range: 1-8) contacts were referred per index case. The median age of index cases was 36.5 years (range: 17-77 years) (Table 1). The median age of all contacts was 33 years (range: 0-88 years) (Table 2). Median income of the interviewed households was 600 GEL (range: 200 – 3000 GEL). Other demographic and clinical characteristics are described in the Table 1&2.

Active TB disease

Among 393 contacts, 7 or 1.8% (95% CI 0.7 – 3.6%) were found to have active TB during the baseline period. This included 5 cases of pulmonary TB and 2 cases of extrapulmonary TB; DST profiles of 6 out of 7 contacts were matched with the DST profiles of their index patients.

Latent TB infection

The prevalence of LTBI among the contacts who performed TST, was 58.8% (95% CI 49.4 – 67.8%).

Contacts aged 15-24 years (OR 22.00; 95% CI 3.42 – 141.70) compared to other age groups were associated with having LTBI (Table 3). Also Index patients aged 15-24 years and >35 years comparing to index patients aged 25-34 years were associated with an increased risk of developing LTBI among their contacts. The odds of having LTBI was greater (OR 2.08; 95% CI 0.99 – 4.37) in contacts of index patients who were not single compared to single index patients. Index patients with higher education level (OR 4.50; 95% CI 1.78 - 11.40) were significantly associated and Index patients with higher household income (>500GEL) were non significantly associated with developing of LTBI among their contacts. The prevalent of LTBI among the contacts of previously treated index patients was greater than among those of index patients with new TB cases, however this difference was not statistically significant (Table 3).

Discussion

There is increasing interest in the utility of contact investigation in LMIC where contact investigation has traditionally not been part of TB control efforts.13 In the past, an "invitation" model of contact investigation was implemented in Georgia. Although the "invitation" model of contact investigation may miss a large proportion of contacts, the retrospective study from NCTBLD in Tbilisi showed the model was successful in TB case detection among contacts.14 However, above mentioned retrospective study showed that a median of 2 (range: 1-8) contacts were referred per index case whereas according to our prospective study, with more active TB contact investigation more contacts – a median of 3 – were referred per index case.

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According to our study, the prevalence of active TB cases among contacts of index patients was almost 2%. We observed that LTBI was highly prevalent among contacts of index patients; more than half of the contacts without active TB disease had prevalent LTBI. We also found some associations between contacts'/index patients' clinical/demographic characteristics, and prevalence of LTBI among contacts.

Our findings are the first data reported from Georgia on the utility of MDR TB patients' contact investigation. This project helped to provide information that can be used to define the benefit of interventions among the contacts of active TB cases in settings of high tuberculosis prevalence and if successful, lead to country wide implementation.

Our study is subject to several limitations. First, because the study included only contacts of index TB cases that received care from NCTBLD in Tbilisi, the cohort may not be representative of the entire country of Georgia. Second, because we did not perform genotyping of M. tuberculosis strains, we were not able to compare transmission patterns and were unable to definitively determine if transmission occurred from the contacts' index patient or from another source.

Conclusion

The burden of active TB disease and LTBI was high among the contacts of active MDR TB cases in this study carried out in Tbilisi, Georgia. Our results suggest that in LMIC such as Georgia, aggressive and timely contact investigation may efficiently enhance TB case finding among recent contacts. Public health interventions are needed to scale up contact investigations and more aggressively identify contacts of index TB cases.

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