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New opportunities in tuberculosis control

To the Editors:

The main objective of a tuberculosis (TB) control programme is to break the chain of transmission in the community [1, 2]. Early identification and effective treatment of infectious cases is key. It is assumed that active TB may develop in ~10% of infected patients, usually within 2 yrs of infection [3].

In our centre (Hospital Center of Vila Nova de Gaia/Espinho, Vila Nova de Gaia, Portugal), reflecting the Portuguese policy, the focus of TB contact investigations used to be only on the persons named by the index case. In 2004, we decided to include a routine evaluation of every patient's home and work environment with the co-operation of public health teams [4].

According to Portuguese guidelines, a close contact is defined as a subject exposed to the index case for >8 h daily or >40 h of cumulative exposure time. All these identified contacts are requested to undergo a screening programme, which includes a symptoms questionnaire, clinical examination, a tuberculin skin test (TST) with 2 TU of purified protein derivative RT 23, an interferon-γ release assay (IGRA) and chest radiography. TST reactions >10 mm in diameter are confirmed with IGRAs. 6 months of chemotherapy with isoniazid is offered to contacts with latent TB infection (LTBI) [5]. The rate of compliance with this preventive treatment, which is not compulsory, has been described to be between 19% and 96% [6].

In this letter, we present a report where failing to identify at-risk contacts and the refusal of preventive therapy resulted in a family cluster.

In 2001, a 28-yr-old female was diagnosed with TB in our outpatient TB clinic. The sputum was smear- and culture-positive for *Mycobacterium tuberculosis*, and the isolate was resistant to streptomycin. The patient began treatment with isoniazid, rifampicin, pyrazinamide and ethambutol in the form of directly observed treatment (DOT). The clinical, radiological and bacteriological courses were favourable.

At that time, contact investigation was based only on clinical interview. The patient named one contact, her husband. The husband was asymptomatic, had normal chest radiography and a positive TST of 21 mm diameter. He was offered preventive treatment but refused. Follow-up was proposed and scheduled, but he failed to attend.

In 2008, the husband came to our outpatient TB clinic, complaining of cough, dyspnoea and asthenia. Chest radiography revealed an infiltrate with cavities in the right apical region. The sputum was smear- and culture-positive for *M. tuberculosis*, and the isolate was resistant to streptomycin. He began treatment with isoniazid, rifampicin, pyrazinamide and ethambutol in the form of DOT. The clinical, radiological and bacteriological courses were favourable.

During clinical interview, this male named only two contacts, both of them cohabitants: his wife and his 6-yr-old son. The wife did not present any sign of recurrent TB. The child presented growth retardation, cough and low-grade fever. Chest computed tomography revealed mediastinal adenopathy and subpleural consolidation at the left lung apex. He began treatment with

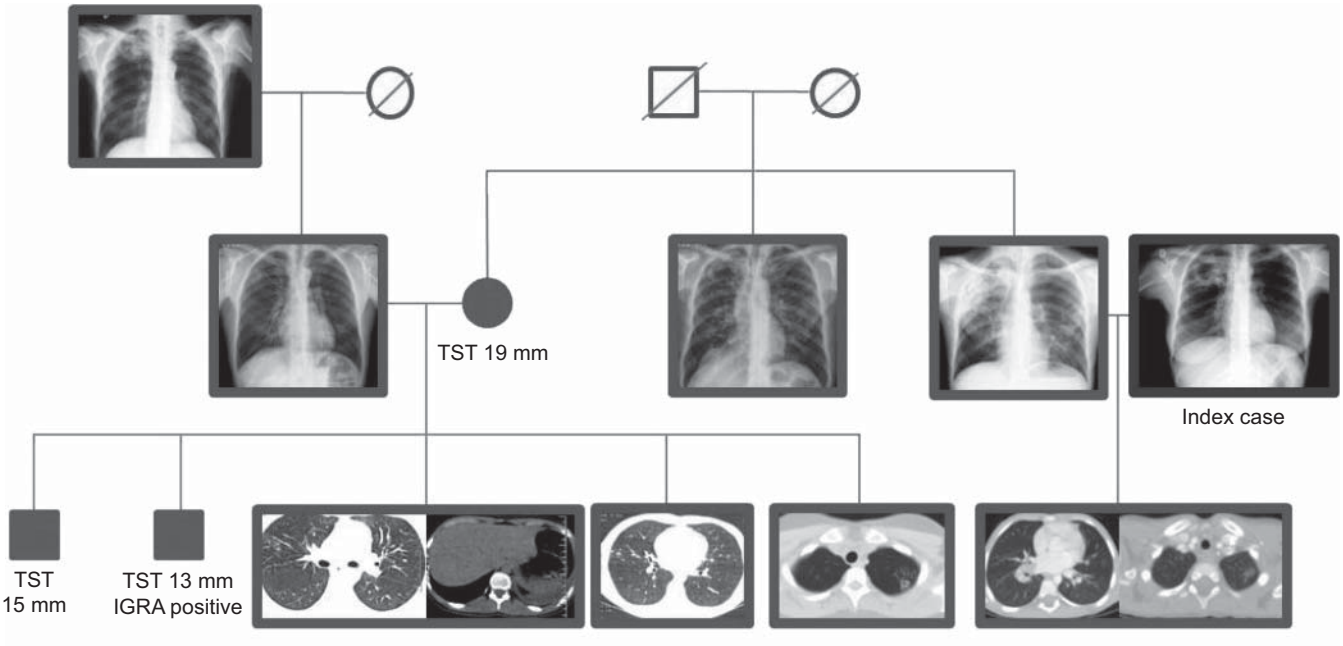

FIGURE 1. Family cluster detected after home and social environment evaluation. TST: tuberculin skin test; IGRA: interferon-γ release assay.

isoniazid, rifampicin and pyrazinamide in the form of DOT, with a good outcome.

By that time, we had already implemented a new contact investigation strategy including an evaluation of the home and workplace. With those visits, potential at-risk contacts not identified in the patient's interview were recognised.

Home and social environment evaluation allowed the identification of a further nine close contacts within the family. Six of them presented abnormal chest radiography and active TB was confirmed by bronchoalveolar lavage analyses, which were culture positive (fig. 1). All isolates were resistant to streptomycin and susceptible to all first-line drugs. They all began treatment with isoniazid, rifampicin, pyrazinamide and ethambutol in the form of DOT. The other three contacts had LTBI. Preventive treatment was offered and accepted.

HIV testing was performed routinely following an opt-out strategy, according to national guidelines, and was negative in all cases.

As the rate of infection was very high and active TB was found in this group, the screening was extended to 24 more individuals. None was infected. There were three cases of positive TST (10–11 mm) but IGRAs were negative.

Home and workplace visits allowed the identification of at-risk contacts who were not detected in the clinical interview. In 2001, the patient did not name all contacts, nor did the husband when he was diagnosed with active TB; he named only two contacts, when in fact nine additional persons were at risk.

Contact tracing interview outcomes are known to be influenced by several factors affecting the interviewer and interviewee. These include the ability of the interviewer and the willingness of the patient to provide the information [7]. These difficulties may help to explain several outbreaks in which the initial patient interview failed to identify at-risk contacts [8, 9]. Visits to homes and workplaces improve the probability of finding unsuspected epidemiological links between patients [4].

Public health visits can also improve treatment compliance by increasing the motivation of contacts to be screened and complete the prescribed course of medication. In 2001, the one contact identified and screened refused both treatment and follow-up. In 2008, all identified contacts accepted screening, and the three individuals infected accepted and completed preventive therapy. Evaluation of a 2-yr period with this strategy showed an improvement of compliance to screening and preventive treatment [4].

One limitation of our study is that we did not perform genotyping. However, the susceptibility pattern, with streptomycin resistance and susceptibility to all first-line drugs, and the confirmed close contact between all patients strongly suggest that all these cases of TB could have been avoided by the treatment of latent infection in 2001.

Contact tracing is included in TB control and elimination strategies in the European Union and European Economic Area [10]. That a lack of identification of at-risk contacts leads to TB outbreaks has already been shown, and it is well known that interviews are not sufficient for contact tracing. The inclusion of home and workplace visits presents a new opportunity in TB control, identifying more at-risk contacts and improving treatment compliance.

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