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POINT OF VIEW

Tuberculin test in tuberculosis contacts, HIV-positive and non-HIV positive children and adolescents, in Rio de Janeiro

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Abstract

We describe the tuberculin skin testing (TST) results tuberculosis contacts using a database of the State Secretary of Health of Rio de Janeiro, Brazil. 2,441 (97%) contacts had a TST ≥ 5mm, 61.9% being < 10 years. Most of the HIV + contacts had a positive TST. Our data suggest that TST is useful in a most of TB latent infection cases, even in HIV infected ones.

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Although Brazil presents high vaccination rates in newborn infants, the tuberculin test could still help to identify latent tuberculosis infection (LTBI) when taking into consideration the previous BCG vaccination, immunosuppression situations, and the child's age[1-4].

The World Health Organization (WHO) recommends preventative therapy with isoniazid (ITP) for HIV-infected individuals if active TB is ruled out[3,5,6].

To describe the tuberculin test results in contacts under 18 years old and in a subgroup, which was tested later for HIV, the State Health Department of Rio de Janeiro (SES-RJ) database was utilized. There were records of reported LTBI in children and adolescents (0 to 18 years old), who have done ITP between January of 2006 and December of 2009. Every one of them was asymptomatic and thoracic X-rays turned out normal.

The reactions to the tuberculin test were divided into four groups: ≥ 15 mm, 10 to 14 mm, 5 to 9 mm, and < 5 mm. Later, these results were re-grouped as: non-reactors (< 5 mm) and reactors (≥ 5 mm)[6,8], and as children (< 10 years old) and adolescents (> 10 years old)[4]. A subgroup of participants had also been tested for HIV. The statistical analysis was based on the description of the categoric values per frequency. The odds ratio (OR) was used to measure the association between the results for tuberculin and HIV tests. The significance level used was 5%.

Of the 2,668 reported cases of LTBI, 1,344 (50.4%) were females. The distribution by age was as follows: 329 (12.3%) up to 1 year and 11 months, 1,382 (51.8%) from 2 to 9 years and 11 months, and 957 (35.9%) from 10 to 18 years and 11 months. Almost in every case (n = 2,534; 94.6%), participants had received the BCG vaccine, and a total of 2,528 (95%) participants were subjected to the tuberculin test. Of this group, 1,412 (55.85%) had positive reactions ≥ 15 mm, 965 (38.17%) had positive reactions between 10 and 14 mm, 64 (2.54%) had positive reactions between 5 and 9 mm, and 87 (3.44%) did not exhibit a positive reaction (< 5mm). Dichotomization of the tuberculin test showed that 2,441 (97%) of contacts were reactors (> 5 mm), and of these, 1,511 (61.90%) were aged 9 years and 11 months or under.

A total of 105 individuals were tested for HIV. Figure 1 shows the results for the tuberculin test in all participants and in the subgroup of participants tested for HIV. Among the HIV-infected individuals , 35/54 (64.81%) were reactors, and 19/54 (35.19%) were non-reactors. Among non-HIV-infected participants, 39/44 (89%) were reactors, and 5/44 (11%) were non-reactors (OR = 0.24 [95% IC: 0.08-0.70]; p = 0.006).

Our data demonstrated that the tuberculin test was three times more likely to show positive results among non-HIV-infected participants than among HIV-infected participants. However, despite the energy caused by HIV, a positive reaction to the tuberculin test was observed in 65% of the HIV-infected participants in an urban population where TB is endemic and BCG vaccination rate is high.

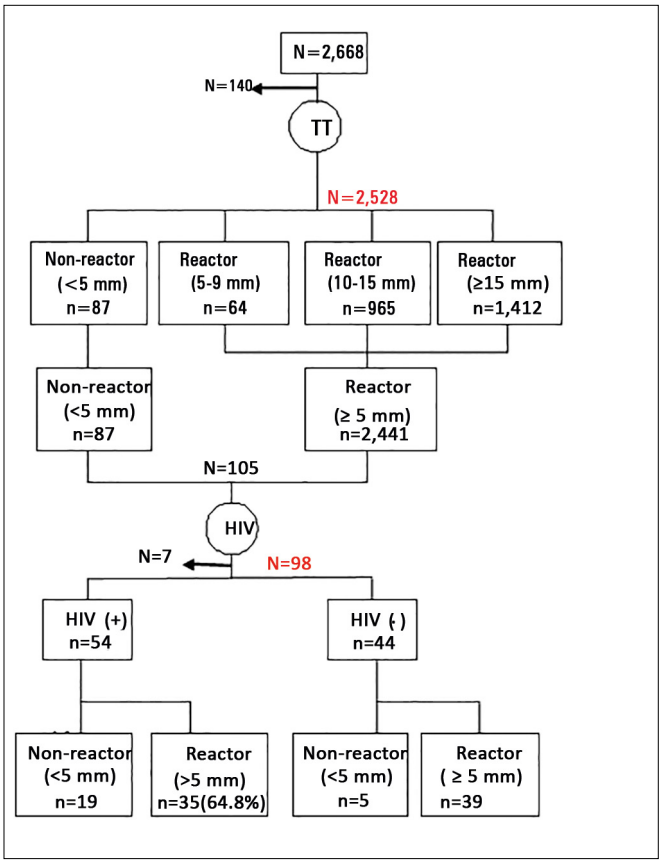

Figure 1. Flowchart describing the 2,668 contacts evaluated in Rio de Janeiro regarding the tuberculin and HIV tests.

When data were collected, the Brazilian guidelines only recommended HIV testing in suspected cases as also recommended by the WHO[7]. On the other hand, it is possible that the immunosuppression among the HIV-infected contacts was not severe, since all these participants were all outpatients.

Because of the universal lack of PPD, starting in 2014, the WHO recommends that both developing and developed countries to perform the tuberculin test and interferon gamma release assays (IGRAs) for LTBI diagnosis. In Brazil, IGRAs are not yet recommended in the routine practice. In Europe, there are discussions about providing PPD again, since the use of IGRAs would be restricted to countries that could afford the high costs of these tests, and where TB incidence is low. IGRAs do not exceed the tuberculin test in terms of sensitivity, and should not be used as the only test to rule out a TB diagnosis in HIV-infected adults or young children[8-12].

Therefore, our data suggest that the tuberculin test may be helpful in most LTBI cases, even in those involving HIV-infected individuals.

Although most HIV-infected contacts showed positive reactions to the tuberculin test, we need to emphasize the WHO guidelines followed in Brazil, in which the ITP should be initiated in HIV-infected contacts without the need to

conduct the tuberculin test if the possibility of active TB has been ruled out[4].

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