Reviewer’s report

Title: Estimating the annual risk of infection with Mycobacterium tuberculosis among adolescents in Western Kenya in preparation for TB vaccine trials

Version: 2 Date: 31 May 2019

Reviewer: Cheng Meng-Hsuan

Reviewer's report:

1. In this study, a total of 5004 patients underwent tuberculin skin test, but only 4808 patients (96 %) returned for the report. What are the characteristics of 4% patients without further visit? Will reasons for loss to follow-up affect the recommendations made in the discussion?

2. It was mentioned in the discussion that the ARTI values measured by the cuff-off method or the mirror method in subjects aged 12-18 years were more than twice as high as those of the 10-year-old subjects measured by serial TST in the same region. The authors cited "Age- and Sex-Specific Social Contact Patterns and Incidence of Mycobacterium tuberculosis Infection" to demonstrate that data for children may underestimate the infection rate in adults, but the literature cited herein refers to subjects older than 18 years. The mean age of the subjects in this article was 14.4 years, but it was twice as high as the serial TST measured by the 10-year-old subjects. Is there any other reason for the rapid rise in such a short period of time?

3. In order to make the TB vaccine trail faster and more cost effective, the interferon-γ release assays (IGRA) conversion is currently used to represent effectiveness of prevention of infection. Most of the enrolled subjects have received BCG vaccine, and the prevalence of HIV infection has changed considerably over time. Both of these factors make it difficult to evaluate the effects of new TB vaccination, also the ideal sample size. This article describes the local TB epidemiology of 12- to 18-year-old adolescents in Kenya, but there are still many questions about whether applied older and less accurate measurements (TST test) are helpful for TB vaccine research.

4. To choose the appropriate sample size for assessing the effectiveness of the TB vaccine, the local rate at which MTB exposure status (TST+, TST-) is converted to TB disease or TB infection over time should also be documented in the same age group.

5. Line 216, repeat "%"
6. Line 59 and 61, error of reference format

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.
Does the work include the necessary controls?  
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?  
If not, please explain in your comments to the authors.

No

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?  
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I am able to assess the statistics

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