

## Prevalence and Annual Risk of Tuberculosis Infection in Rural Mysore

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We carried out a tuberculin survey among 5-10 years old children in rural Mysore ( $n=1026$ ) to estimate the annual risk of tuberculosis infection (ARTI). 90.8% of them had BCG scar. The prevalence of infection was estimated as 13.3% with 95% CI of 11.4-15.5 and ARTI as 1.38%. These figures are comparatively higher than what is reported from other places in India.

**Key words:** Annual Risk of Tuberculosis infection, India, Prevalence.

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**T**uberculin survey is the time tested epidemiological tool to detect TB infection in children [1-3]. Annual risk of tuberculosis infection (ARTI), used widely as the surrogate measure of incidence, is defined as the probability of acquiring a new TB infection during the course of 1 year and is computed from estimated prevalence of infection among younger children [3,4]. We carried out this survey to ascertain the prevalence of tuberculosis and ARTI in children belonging to rural Mysore. Little information is available in this regard from Karnataka, other than from Bangalore [5,6].

### METHODS

This cross sectional study was undertaken during May-July 2005 in a rural school near Mysore among children between 5-10 years of age. Ethical clearance was obtained from ethical review committee of JSS medical college. Written consent was taken after explaining the study. Children were enrolled according to the attendance register. Children were examined by a pediatrician. Anthropometry and BCG scar status were entered in the proforma. Those who were on ATT were excluded from the study.

*Tuberculin administration:* Children were given PPD-S 0.1 mL of the standard 1 TU of PPD RT23 intradermally on the volar aspect of the forearm. The tuberculin test was read after 72 hours of injection. The maximum transverse diameter was measured with pen and plastic ruler method. Tuberculin reaction sizes obtained were arranged in the form of frequency distribution table and converted to the graph to identify the mode and antimode of reactions. We used Prism's graph pad version 3 for calculating prevalence and its confidence interval.

### RESULTS

A total of 1057 children aged between 5-10 years were enrolled in the study. Out of them only 1026 came back for tuberculin reading. Of these children 932 (90.8%) had BCG scar. **Table I** depicts the age distribution of registered children. The frequency distribution of reaction sizes among all children is shown in the **Fig. 1**.

The frequency distribution with reaction size on the x-axis was found to be bimodal with antimode at 9mm. This was taken as cut-off. The prevalence of tuberculosis was calculated to be 13.3% (95% CI: 11.4-15.5). Annual risk of tubercular incidence was

**WHAT THIS STUDY ADDS?**

- This study provides baseline information of prevalence and ARTI in rural Mysore and highlights the high prevalence in this population compared to similar population in south India.

calculated to be 1.38, presuming the average age of participants as 7.5 years.

**DISCUSSION**

The prevalence rate of infection was estimated as 13.3% with 95% CI of 11.4-15.5. ARTI calculated was 1.38% in the present study. Comparative National level ARTI is 1.5%, and from South, East, West and North India is, 1.1%, 1.3%, 1.8% and 1.9%, respectively [1,5-7]. A similar study from Bangalore reported the prevalence to be 8.08% and 8.6% for unvaccinated and vaccinated children, respectively. The estimated ARTI in that study was 1.12% and 1.19% in unvaccinated and vaccinated children, respectively [8]. Another study from Trivandrum reported ARTI of 0.75% in 2000 [3]. Similar study by Chadha, *et al.* [6] in 2006 has reported a prevalence of 9.8% and ARTI of 1.5%. Another recent study in 2010 from tribal population of Madhya Pradesh has reported a prevalence of 6.3% and ARTI of 1.2% [9]. The variability of the prevalence between these studies could be attributed to regional differences in the extent of tuberculosis, methodology in using tuberculin and because of better performance of health care systems. Our study children belonged to the lowest socioeconomic class. This could explain the higher prevalence in this group.

Studies have shown that tuberculin surveys among 5-9 years help in estimating the ARTI

**TABLE I** AGE DISTRIBUTION OF REGISTERED CHILDREN

Age (y)	No of children	%
5	42	4.1
6	75	7.3
7	120	11.7
8	163	15.9
9	118	11.5
10	508	49.5
Total	1026	100.0

irrespective of BCG coverage. They have suggested that in areas of high BCG coverage, results of tuberculin testing among vaccinated and unvaccinated can be combined [8,10,11]. Therefore, we did not attempt to study prevalence rates and ARTI amongst vaccinated and unvaccinated groups separately.

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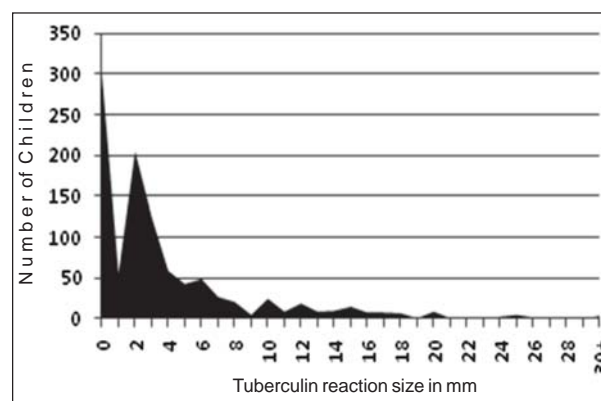
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**FIG. 1** Frequency distribution of tuberculin reaction sizes in children.

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