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INTRODUCTION

As a part of the training schedule of WHO in-country fellowship on "TB Control and Epidemiology", 8 fellows were imparted training from 4th October-12th November 2004 at NTI, Bangalore. During the training they were divided into two groups and each group was given following assignments:

(1) To determine sensitivity of 1TU PPD of Span Diagnostics among smear positive pulmonary TB patients of SDS Sanatorium, Bangalore and

(2) To find out the prevalence of tuberculous infection among child contacts of smear positive cases

These assignments were towards imparting skills in protocol writing, planning, organisation & implementation of fieldwork, analysis and report writing for conducting such kind of epidemiological studies in future in their respective areas. The reports on the above assignments are published in this issue of NTI Bulletin. Since the sample size in both the studies was small due to time constraints, the results derived were not conclusive.

Paper 1: Tuberculin Sensitivity

SENSITIVITY OF 1TU PPD OF SPAN DIAGNOSTICS AMONG SMEAR POSITIVE PULMONARY TUBERCULOSIS PATIENTS OF SDS SANATORIUM, BANGALORE

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ABSTRACT

It was proposed to study the sensitivity of 1TU PPD RT 23 supplied by the Span diagnostics Ltd. Thirty seven (37) adult Tuberculosis patients diagnosed as sputum positive within the last 14 days and hospitalized at SDS sanatorium were registered and tested with 1TU of Span diagnostic intradermaly. Number of satisfactorily test read were 31, out of which males were 20 and females 11 (64.5% and 35.5% respectively). Sensitivity of Tuberculin at 10mm cut off was 58.1%, it was 51.6% at 12mm and 38.7% at 15mm. Though the sensitivity in the study is lower than that expected, the same cannot be concluded due to inadequate sample size. A study with a larger sample size is suggested to arrive at more conclusive findings.

Key words: Sputum positive, Tuberculin test, Reaction size, Sensitivity test.

INTRODUCTION

TB is a major public health concern in India. The Tuberculin test is extensively used in TB Epidemiological surveys to assess the disease situation and its trends in a representative sample of the community. In clinical practice, it is used to find out the presence or absence of tuberculous infection. It aids in the differential diagnosis of TB among children and to decide about administration of chemoprophylaxis. The

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sensitivity of a test is defined as the proportion of the people correctly identified with a given characteristic.

Tuberculins are immunobiologicals whose potency, specificity, antigenicity and stability usually varies from laboratory to laboratory and even batch to batch prepared in the same laboratory in a manner which is difficult to predict and control. In India, tuberculin PPD vials were being supplied by BCG laboratory, Guindy till the year 2003. Since the BCG laboratory has now stopped supplying Tuberculin, there is need to explore the other Tuberculin products available in the country. The Span Diagnostic Ltd (SDL), Surat is one of the leading firms manufacturing 1TU of PPD RT23 with Tween 80, which is a diluted and ready to use solution for performing the tuberculin test. Hence to know the sensitivity of the tuberculin supplied by SDL, this study was carried out among smear positive pulmonary TB patients hospitalized at SDS Sanatorium, Bangalore.

MATERILAS AND METHODS

(a) Study Design

A cross-sectional study.

(b) Study Period

The study was conducted between 15th October 2004 to 25th October 2004 at SDS sanatorium Bangalore.

(c) Sampling method

No sampling technique was adopted since all the smear positive cases admitted in SDS sanatorium during the study period were registered.

(d) Study population

The study population comprised of adult cases diagnosed as smear positive pulmonary TB and hospitalized at SDS sanatorium Bangalore.

(e) Field procedure

Thirty seven (37) available smear +ve TB patients who were admitted at the Sanatorium and were smear positive within the last 14 days were registered for tuberculin testing. HIV positive patients, critically ill patients and febrile patients were dropped out of the study as they could be immunocompromised which may cause false negative reactions. The tester administered 1 TU of PPD RT23 with Tween 80 on the mid-volar aspect of the left forearm with disposable tuberculin syringes. The reading of the reaction was performed between 48-96 hours and the relevant information pertaining to the patient was entered in individual patient cards.

(f) Ethical consideration

The reagent and all the procedures used in the study constituted no hazard to the subjects except transient itching and swelling among a small proportion of individuals. No individual was forced to participate.

(g) Analysis

After the reactions were read, the entries in the patient cards were entered in the computer for analysis by using EPI INFO software. The sensitivity of tuberculin was determined at different cut-off points.

RESULTS

Out of 37 smear positive adult TB cases registered, 34 were tested satisfactorily, 3 were unsatisfactorily. Out of 34, 31 were test read (males 20, females 11 and 3 were absent for reading. The 3 unsatisfactorily tested and the 3 absentees were excluded from the analysis. Age and sex distribution of the test read population is given in table 1.

Flow chart showing the No. Cases test read

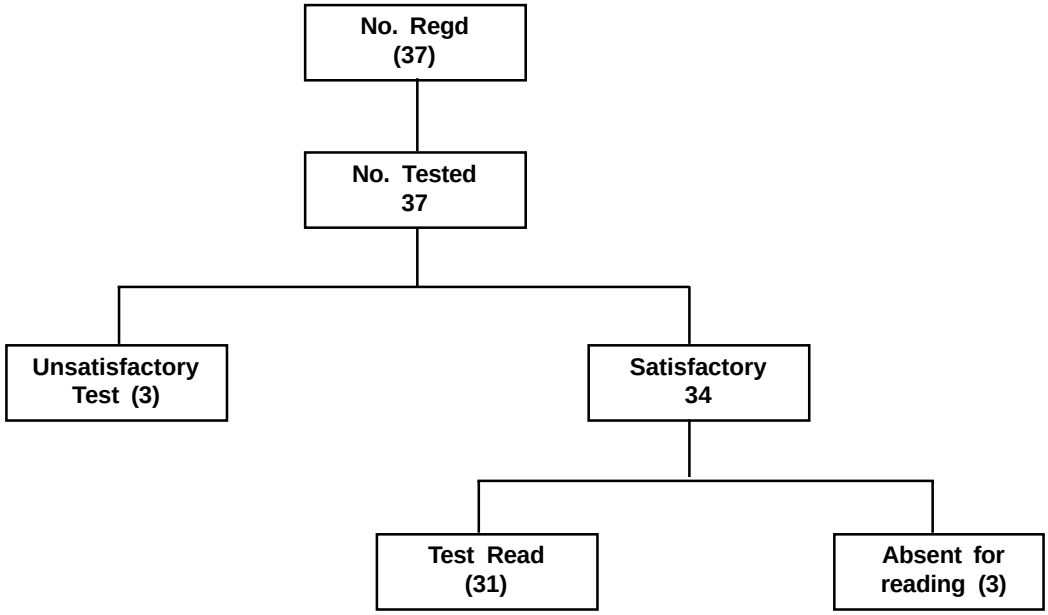

Table 1: Age & Sex distribution of patients satisfactorily test read

Sl. No.	Age in years	Males	Females
1	15—34	11	2
2	35—54	6	5
3	55 & Above	3	4
	Total	**20**	**11**

The sensitivity of tuberculin was found to be 58.1% cut-off at 10mm, it was 51.6%, at 12 mm and 38.7% at 15mm. The confidence limits are given in the table 2.

Table 2: Sensitivity of Tuberculin at different cut off points

No. of reaction size ≥10mm	%	No. of reaction size ≥12mm	%	No. of reaction size ≥15mm	%
18	58.1 (39.1-75.5)	16	51.6 (33.1-69.8)	12	38.7 (21.8-57.8)

Figures in Parenthesis are 95% Confidence Interval

Discussion

The outcome of the study provided the information on tuberculin sensitivity among smear positive TB patients. The sensitivity of the tuberculin was found to be 58.1% at 10 mm and 39% at 15 mm cut off points respectively. The sensitivity of different batches of 1 TU PPD RT 23 with tween 80 obtained from BCG Lab, Guindy and used in the NSS-ARI survey indicated a range of 82 - 94% at 14mm and 80 – 94% at 15mm cut off points respectively.

In the current study, since the sample size was small, the results derived from it cannot be generalised. The study can be considered as a pilot study for planning bigger studies at later point of time. The sensitivity of this tuberculin can be decided after testing more number of smear positive TB cases and also by comparing it with other standard tuberculin like that of 1 TU RT23 with tween 80 of SSI Copenhagen. The study was conducted under the close guidance and supervision of staff experienced in TB epidemiological studies.

Acknowledgement

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Paper 2: Contact Study

PREVALENCE OF TUBERCULOUS INFECTION AMONG CHILD CONTACTS OF SMEAR POSITIVE CASES OF PULMONARY TUBERCULOSIS

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ABSTRACT

A pilot study was conducted to find out the prevalence of tuberculous infection among child contacts of smear positive cases of pulmonary TB, in selected slums of Bangalore city. 57 child contacts (1-14 years of age) residing in the house and the neighborhood of smear positive TB patients in urban slums of Bangalore city were tuberculin tested.

The finding of this study revealed that about one third of children residing in the households and neighborhoods of these cases were infected with *Mycobacterium tuberculosis.* This indicates a high level of transmission of tuberculous infection among child contacts of smear positive TB patients suggesting further intensification of Revised National Tuberculosis Control Programme RNTCP in urban slums

Keywords: Tuberculosis, Child contacts, Tuberculin, Smear Positive patients, Revised National Tuberculosis Control Programme RNTCP, Slums.

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INTRODUCTION

Tuberculosis (TB) is one of the major public health problem in India. It is an infectious disease caused by *Mycobacterium TB.* Burden of TB is expected to increase further because of population growth and advent of HIV epidemic. The impact of HIV epidemic on TB is likely to be more significant in India because of high prevalence of TB infection in the age group of 15 to 59 years. It is estimated that a third of world population is infected with TB, 8 million become sick and more than 2 million die globally every year. One smear positive patient can disseminate the infection to 10 -15 persons every year, if left untreated.

Bangalore City is growing with rapid increase of population due to massive migration, better job opportunity being one of the significant causes. Consequently, the number of slums is also increasing and getting overcrowded. The condition of the people living in slums is poor with lack of ventilation, awareness of diseases, poor hygiene, nutrition and lack of immunity as a whole. These conditions facilitate the transmission of tuberculous infection. Children are the worst sufferers in such situations since the risk of break down from infection to disease is higher in them. A pilot study was therefore planned to find out the prevalence of TB infection among the child contacts of smear positive cases in selected slums of Bangalore city.

MATERIALS AND METHODS

Study design

A cross-sectional study.

Study Population

Study population comprised child contacts (1-14 years of age) of smear positive cases residing in the house and their neighborhood in urban slums of Bangalore city.

Field Procedures

Initially a visit was undertaken to Broadway TB Unit (TU). All the TB patients coming from Doddigunta and Kamanahalli slums diagnosed as smear positive pulmonary TB within the past one year were listed from the TB register/ laboratory register/treatment cards. With the help of this list, the study team undertook visits to all the patients' houses. Children residing in the house of a patient as well as in the neighborhood (four houses on either side and opposite to the patient's house) were registered. No sampling was therefore adopted

0.1 ml of 1TU PPD RT23 with Tween 80 (SPAN Diagnostics Ltd.) was injected intradermally on the mid valor aspect of left forearm by using disposable tuberculin syringe following standard guidelines. An experienced tester performed the test. The test was considered satisfactory, when the test raised a flat pale pea sized wheel with clear pits of hair follicles without any leakage of tuberculin. The reading of the reaction was done between 48-96 hours by measuring the maximum transverse diameter of the induration with the help of a transparent scale. The same was recorded in mm and any unpleasant reaction like oedema, bullae, necrosis, etc were also noted.

RESULTS

During conduct of the study 61 children aged 1-14 years were registered.10 in patient's house and 51 in the neighbourhood. Out of 61 children, tuberculin test was satisfactorily done for 57 children of which 47 were test-read. Of 47 Satisfactorily test-read children, 17 (36%) were found to be infected at 10mm cut off point, 16(34%) at 12mm and 15 (32%) at 15mm cut-off points.

DISCUSSION

Finding of this study revealed a high level of transmission of TB infection among child contacts of smear positive TB patients residing in urban slums of Bangalore City. About 1/3rd of children residing in the households and neighborhoods of these cases were found to be infected with *mycobacterium tuberculosis*. This was much higher than the prevalence of infection observed during a recently conducted nationwide survey where 6.5 to 10.3% children residing in selected rural and urban areas in the four defined zones of India were found to be infected. This suggests further intensification of RNTCP services in slum areas. Also, the practice of chemoprophylaxis may be extended to the child contacts of neighborhood cases also.

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