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ROLE OF MANTOUX TEST IN DETECTING TUBERCULOSIS IN TUBERCULOSIS SUSPECTS

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ABSTRACT

Objectives: To know the role of Mantoux test in detecting tuberculosis in tuberculosis suspects attending to MIMS General Hospital, Nellimarla, Vizianagaram.

Methods: A total of 445 tuberculosis suspects between the age group 2 year to 70 year from rural area after taking written consent were included in the present study for a period of 1 year from April 2012 to March 2013. Inclusion criteria were smear negative & Chest X ray negative cases. Exclusion criteria were HIV infection & other immunosuppressive conditions. Mantoux test was done by injecting 0.1 ml of 5 TU PPD (Span) intradermally into the volar aspect of left forearm. The skin area free of lesions and away from veins was chosen. The injection was made by 1/4th to 1/2 inch 27 gauge needle and a tuberculin syringe so that an elevation of 6-10 mm was produced. Tests were read between 48-72 hrs after injection. The diameter of the indurations was measured transversely along the long axis of forearm.

Results: Out of 445 cases, 295 cases were positive (66.3%) having indurations of more than or equal to 10 mm. It was positive in 88.23 % in children in 2-5 years age, 78% in females and 60% in males.

Conclusion: In the present study Mantoux test was positive in 66.3% of sputum smear & chest X ray negative tuberculosis suspects in comparison to 30-40% in general population of India. So it has a role in detecting extra 26% of infection with M. tuberculosis in this group.

Key Words: Mantoux test, Tuberculosis suspects

INTRODUCTION

Tuberculosis suspect means when a diagnosis of tuberculosis is being considered, whether or not treatment has been started, until the diagnostic procedures have been completed. The Tuberculin Skin Test is the only proven method for identifying M. tuberculosis infection. Although it is less than 100 % sensitive and specific, it gives a high positive predictive value in population with high prevalence of M. tuberculosis infection (1). It is less sensitive but more specific compared to gamma interferon assay (2). It is currently the only widely used method for identifying latent tuberculosis infection and tuberculosis in not clinically active cases.

AIM OF THE STUDY: To know the role of Mantoux test in detecting tuberculosis in tuberculosis suspects attending to MIMS General Hospital, Nellimarla, Vizianagaram.

MATERIALS AND METHODS: This is a retrospective study.

Study group: A total of 445 tuberculosis suspects between the age group 2 year to 70 year from rural area after taking written consent.

Study period: for a period of 1 year from April 2012 to March 2013.

Inclusion criteria: smear negative & Chest X ray negative cases.

Exclusion criteria: HIV infection & other immunosuppressive conditions.

Mantoux test: It was done by injecting 0.1 ml of 5 TU PPD (Span) intradermally into the volar aspect of left forearm. The skin area free of lesions and away from

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veins was chosen. The injection was made by 1/4th to 1/2 inch 27 gauge needle and a tuberculin syringe so that an elevation of 6-10 mm was produced. Tests were read between 48-72 hrs after injection. The diameter of the indurations was measured transversely along the long axis of forearm. (1).

RESULTS

DMC data from April 2012 to March 2013--TB suspect screened were 1044 cases (which includes 144 cases of extra pulmonary tuberculosis). Out of them sputum smear positive were 80 cases and chest X ray positive were 120 cases.

We have done Mantoux test in 475 patients. Out of them 30 patients did not turn up & were excluded from the study. Out of 445 patients included in the present study, 224 cases were children between 2-13 years age, 221 cases were adults between 14-70 years age, 249 cases were outpatients and 196 cases were inpatients; and 290 cases were female and 155 cases were male.

The Cut-off for Mantoux test was 10 mm indurations (1).

Out of 445 cases, 295 cases were positive (66.3%) having indurations of more than or equal to 10 mm. It was positive in 88.23 % in children in 2-5 years age, 78% in females and 60% in males. We have observed 10-15 mm indurations in 84 cases, 16-20 mm indurations in 50 cases, 21-25 mm indurations in 126 cases and 26-30 mm indurations in 35 cases. We did not notice any vesicle formation. All 30 positive cases in 2-5 yrs age had indurations of more than 15 mm.

DISCUSSION

Immunological basis of Tuberculin Reaction: It is a delayed type of hypersensitivity reaction. Sensitized T-lymphocytes are recruited to the site where they release lymphokines. Lymphokines induce indurations through local vasodilatation, edema, fibrin deposition and recruitment of other inflammatory cells to the area.

Essential feature are--

1. Its delayed course reaching a peak after 24 hrs.
2. Its indurate character.
3. Its occasional vesicle formation & necrosis which does not correlate with active disease.

Reaction begins 5-6 hrs after injection, causes maximal indurations at 48-72 hrs and subsides over a period of time; positive reaction often persists for up to 1 week. In elderly, positive reaction may not peak until after 72 hrs. Immediate hypersensitivity reaction to tuberculin or its

constituents may occur and disappears by 24 hrs. But if the reaction is severe retesting should not be done.

Cut-off:

- A cut point of ≥ 10 mm is suggested as positive for individuals having normal or mildly impaired immunity in BCG-vaccinated high prevalence population. (3)
- A cut point of ≥ 5 mm is suggested as positive for persons who are immune suppressed
- (HIV infection, drugs).

BCG vaccination:

- Post vaccination BCG induced tuberculin reactivity ranges from 0-19 mm indurations. In community based study there is no difference in prevalence of ≥ 10 mm indurations in BCG vaccinated and non vaccinated adolescents & young adults. Tuberculin test is not contraindicated and skin test results are used to support or exclude infection with *M. tuberculosis*. A positive tuberculin test after BCG vaccination does not predict its protective efficacy. (3,4).

In the present study:

The Mantoux test was positive in 66.3% of cases. In children 2-5 years of age, it was positive in 88.23 % of cases and all of them had indurations more than 15 mm. Reactions larger than 15 mm are unlikely to be due to previous BCG vaccination or exposure to environmental mycobacterium. (5). These children are at high risk for progression to active disease, with the potential for dissemination. (6). Although more number of females was screened, the test was positive in 60% of females compared to 78% in males. Inpatients had more positive reaction (79.6%) than outpatients (55.8%). There are various reports regarding tuberculin test results in individuals having tuberculosis. It has a reported false negative rate of 25% during the initial evaluation of persons with tuberculosis which appears to be due to poor nutrition, acute illness or immune suppression. (7, 8)

CONCLUSION

In the present study Mantoux test was positive in 66.3% of sputum smear & chest X ray negative tuberculosis suspects in comparison to 30-40% in general population of India. So it has a role in detecting extra 26% of infection with *M. tuberculosis* in this group. However further follow up to be done for these individuals and they should be evaluated and treated accordingly.

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Table 1: Age and Gender distribution of study group

Age	Male	Female	Total
2-5 yrs	12	22	34
6-13 yrs	52	138	190
14-20 yrs	28	58	86
21-30 yrs	7	37	44
31-40 yrs	32	22	54
41-50 yrs	7	12	19
51-60 yrs	2	12	14
61-70 yrs	2	2	4
Total	155	290	

Table 2: Gender distribution of patients with positive Mantoux test. (Positive indicates Mantoux test result ≥ 10 mm indurations)

AGE	Male			Female			Total		
	scree- ned	pos- itive	%	scree- ned	posi- tive	%	scree- ned	posi- tive	%
2-5 yrs	12	10	83.33	22	20	90.9	34	30	88.2
6-13 yrs	52	37	71.2	138	90	65.2	190	127	66.8
14-70 yrs	91	74	81.3	130	64	49.23	221	138	62.4
Total	155	121	78	290	174	60	445	295	66.3

Table 3: Distribution of patients in outpatients and inpatients departments with positive Mantoux test. (Positive indicates Mantoux test result ≥ 10 mm indurations)

	No. of patients screened	Mantoux positive	%
Outpatients	249	139	55.8
Inpatients	196	156	79.6
Total	445		

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