Mantoux test defaulters in rural population attending tertiary care hospital in a tuberculosis endemic area

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ABSTRACT

Background: Tuberculosis (TB) is one of the main causes of mortality among infectious diseases. The prevalence of tuberculosis is very high in developing countries such as India. Mantoux test is frequently used for the diagnosis of latent or active tuberculosis despite low sensitivity and specificity. However, the Mantoux test is a crucial test in a resource-less setup for the diagnosis of TB. Therefore, the main purpose of this study was to find the dropout rate and dropout reasons in Mantoux testing. Methodology: All suspected TB patients attending out-patient department and further tested for Mantoux test. Results: Of the total 789 Mantoux tests, 459 (58%) were negative, 195 (25%) were positive, and 135 (17%) were dropouts. One of the main reasons for dropout was patients did not give importance to the Mantoux test. Conclusion: Dropout rate in Mantoux testing can be reduced by patient counseling regarding TB and Mantoux test by the doctor.

Keywords: Latent tuberculosis, Mantoux test, tuberculin skin test, tuberculosis

Introduction

Tuberculosis (TB) is a chronic infectious disease caused by Mycobacterium tuberculosis and one of the major diseases affecting all age groups throughout the world. TB remains one of the major public health problems, especially in India with a high burden, due to the high morbidity and mortality.[13] The majority of people infected with M. tuberculosis remain asymptomatic due to the latent infection, and the infected patients remain the source of active infection.[8] One of the major factors confronting the effective treatment of TB is the lack of awareness and poor socioeconomic background of the patients in developing countries. Other factors are late diagnosis and treatment of patients and poor health-seeking behavior of infected patients.[14]

Mantoux test (tuberculin skin test [TST]) was introduced over a century ago for the detection of latent and active TB infection, and it is still in practice for diagnosis in all age groups in India. Poor sensitivity and performance of microscopic tests and the high cost of confirmatory tests make TB diagnosis difficult in endemic areas of India. Therefore, TST is a crucial test in a resource-less setup for the diagnosis of TB.[11] Hence, the aim of the present study was to evaluate all possible reasons for Mantoux test defaulters (who all did not report back after 48–72 h for the interpretation to the respective department) coming to the out-patient department at our tertiary care center.

Materials and Methods

This study was done in the M M Medical College and Hospital, Solan, between Jan 2018 and 2020. Ethical clearance (MMU/IEC/P No. 14/17) was taken from the Institutional Ethics Committee. All patients attending the out-patient department and further tested...
for the Mantoux test were considered for this study. Mantoux tests done on in-patients were excluded from the study. Tuberculin PPD-RT23 IP02TU/0.1 mL reagent (ARKAY, Inc.) was used for Mantoux testing. Tuberculin PPD-RT23 was injected intradermally over the mid-volar aspect of the left forearm using a 27-gauge needle of tuberculin syringe. Before the Mantoux testing, each of them was asked to fill a questionnaire related to knowledge and awareness of test prescribed to them related to their suspected TB infection [Table 1-3]. Patients were advised to report back after 48–72 h for the result. Equal or more than 10 mm transverse diameter of the induration was considered as positive and less than 10 mm was considered as negative for the Mantoux test. If patients did not return after 1 week for result interpretation, then the telephonic conversation was sought to find the reason in the form of a predesigned questionnaire for not reporting back [Table 4].

Results

A total of 789 TSTs were done in patients with clinical suspicion of TB as recommended by the treating physician. Most of the patients 709 (90%) belonged to rural backgrounds with low socio-educational status, 401 (51%) as described in Tables 1 and 2.

The majority of the patients were unaware of the significance of the test performed and its relation to the suspected clinical condition. Even after proper instruction was given to the patients before the test, 10% of patients had no idea about reporting back after 48–72 h for the result interpretation as given in Table 3.

Among the total numbers, 459 (58%) cases were negative and 198 (25%) were positive for the Mantoux test. However, 135 (17%) cases did not report back for the result. All the defaulters were contacted through telephone after 1 week of skin test for seeking out the reasons for not reporting back to the hospital for further consultation [Tables 4 and 5].

Discussion

TST is important in clinical as well as epidemiological settings. Mantoux test is one of the old and conventional tests for the diagnosis of TB in developing countries because of its cost-effectiveness and availability. This test gives indirect clue in the form of hypersensitivity to tubercle bacilli exposure to the patients. In the current study, the occurrence of Mantoux positivity was 25%. This result was expected as Himachal Pradesh (India) has a high prevalence of TB with low socio-educational status in rural areas. Rezai et al. and Lwin et al. also reported 26.2% and 20.8% positivity for TST, respectively, in tuberculosis endemic areas. The prevalence of the Mantoux test varies from country to country and population to population. Several factors are responsible for it in a particular population such as vaccination status, active tubercular disease, latent tubercular infection, non-tubercular infection, hygiene status, awareness regarding TB, socio-economical and educational status. In our study, most of the patients did not have general knowledge about the Mantoux test; therefore, it is one of the

| Q. no | Questions | Answers |
|---|---|---|
| 1. | Did you know that skin test has been given to you? | Yes: 15 (2%) No: 774 (98%) |
| 2. | Did you know for what purpose the test has been given to you? | Yes: 37 (5%) No: 752 (95%) |
| 3. | Were you told about importance/significance of the skin test? | Yes: 24 (03%) No: 765 (97%) |
| 4. | Were you told about this skin test to report back after 48-72 hrs for interpretation check-up? | Yes: 710 (90%) No: 79 (10%) |

| Table 4: Possible reason for dropout | Total (135) |
|---|---|
| 5. | You just forgot to collect the reports? | 27 (20%) |
| 6. | You didn’t give priority or importance to the report collection over your work? | 29 (21%) |
| 7. | Did you think that the test was the cure itself? | 04 (03%) |
| 8. | Did you find yourself alright after the test and did not feel the need to go back to the hospital even for the reports? | 11 (08%) |
| 9. | Did you perform some religious activity to cure your disease? | 08 (06%) |
| 10. | Did you have any financial issue to revisit the hospital? | 19 (14%) |
| 11. | Were there any transportation issues or the bus timings were not appropriate for you to reach the hospital? | 05 (04%) |
| 12. | Did someone influence you that mantoux test report does not hold any importance? | 04 (03%) |
| 13. | Did the weather conditions hamper you from coming to the hospital? | 02 (01%) |
| 14. | Did some other person influence you to take his treatment? | 05 (04%) |
| 15. | Was there some issue with your family member not believing in allopathic medicine and preferring rather their own home remedies? | 09 (07%) |
| 16. | Any other reason | 12 (09%) |
main reasons for their dropout for result interpretation. Among all dropouts, 21% of patients did not give importance, 20% were simply forgotten to report back for result interpretation, and 14% had financial restraint to approach the hospital. Apart from awareness issues, rural patients comparatively had an increased likelihood of visiting traditional healers due to poorer access to health facilities. The resulting delay in seeking medical care has been shown to contribute to ongoing TB transmission.\textsuperscript{[7‑10]} Long-term strategies should be applied to resolve these kinds of issues. Clinicians and laboratory doctors must take initiative to overcome with defaulter situation by giving them proper information regarding TST. Simultaneously encourage the patients to report back to the hospital for test interpretation.

**Conclusion**

A study from our center reflects the high positivity for TST. TST is one of the conventional tests for the diagnosis and management of TB in endemic areas, especially with the low socio‑economical status of the rural population. TST recipients should be sensitized to TB infection and be aware of the importance of TST to minimize the TST dropout for early detection of TB.

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**Conflicts of interest**

There are no conflicts of interest.

### Table 5: Results of Mantoux test

| Total Mantoux test | 789 (100%) |
|--------------------|------------|
| Negative           | 459 (58%)  |
| Positive           | 195 (25%)  |
| Defaulters         | 135 (17%)  |

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