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PERFORMANCE OF ICT-TB TEST IN THE DETECTION OF PULMONARY AND EXTRA-PULMONARY TUBERCULOSIS

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Background: Tuberculosis is a major public health problem of the developing nations including Pakistan. We need a simple, economical and non invasive test to make an early diagnosis of T.B. in order to avoid the complications. Methods: A study was conducted at the Dept. of Pulmonology, PGMI LRH Peshawar & Ayub Teaching Hospital Abbottabad with the collaboration of Deptt of Pathology KMC Peshawar from Jan 1998 to Dec 2002. A total of 129 patients were included in the study. Out of these 129 patients 52 were pulmonary TB (PTB) smear positive, 30 were PTB smear negative, 30 pleural effusion & 17 were TB lymphadenitis. The control group consisted of 25 non TB patients and healthy subjects. Results: Antibody was detected in 23 of 52 (44%) sputum positive patients, 11 of 30 (36%) sputum negative PTB patients, 10 of 30 (20%) patients of TB pleural effusion and 6 of 17 (35%) patients of TB lymphadenitis. Antibody was detected in none of the control subjects. The overall sensitivity for Pul-T.B. Sputum positive patients was 44%, 36% for sputum Negative Pulmonary TB, 20% for TB pleural effusion and 35% for TB lymphadenitis. The specificity was 100%. Conclusion: ICT-TB is a highly specific, but less sensitive aid in the diagnosis of Pulmonology and extra Pulmonolgy TB.

INTRODUCTION

Tuberculosis (TB) still ranks as one of the major diseases and is a leading killer of mankind.[1] Currently a large number of our population is infected with Mycobacterium Tuberculosis and is at the risk of developing the disease.[2] It is a major public health problem in Pakistan.

The diagnosis of tuberculosis depends upon a number of tests such as Chest X-ray, acid fast bacilli (AFB) stain and culture of sputum. These conventional methods are not satisfactory because sputum AFB stain is less sensitive and AFB culture takes more than 3 weeks to produce results.[3] More sensitive and specific tests such as Polymerase Chain reaction (PCR) are too expensive for routine laboratory diagnosis of TB.

The recently introduced serological test ICT-TB rapidly detects antibodies in the serum of pulmonary & extra pulmonary TB patients. It is said to be a reliable test to make an early diagnosis of TB.

MATERIAL AND METHODS

The study was conducted during the period from January 1998 to Dec 2002 at the Department of Pulmonology, Ayub Teaching Hospital Abbottabad and LRH Peshawar with the collaboration of Department of Pathology, Khyber Medical College Peshawar.

A total of 129 patients were selected from the patients who had been hospitalized in the Pulmonology unit of Lady Reading Hospital Peshawar and Ayub Teaching Hospital Abbottabad.

The control group consisted of 25 non TB patients or healthy subjects who showed no evidence of TB on Chest X-Ray and AFB Stains.

The sera were separated and ICT was performed according to the manufacturer's manual. Briefly 30 ml of serum and three drops of reagent consisting of antihuman IgG coated particles were applied to each side of the membrane, enabling reactions to takes place between the membrance fixed antigens and antibodies in the serum

followed by antibody-antihuman IgG complex formation produc-ing one or more pink lines with in 15 minutes. The test was positive if the control band was observed and one or more positive bands were seen. The specificity and sensitivity were calculated.

RESULTS

The percentage of patients and control subjects who showed positive antibody response are given in Figure 1.

The assay detected 44% (23 of 52) of sputum positive cases, 36% (11 of 30) of smear negative pulmonary TB, 20% (10 of 30 patients) of TB Pleural effusion and 35% (6 of 17) of TB Lympadenitis patients. None of the control subjects had positive ICT-T.B. The sensitivity for smear positive pulmonary TB was 44%. It was 36% for TB smear negative Pulmonary TB, 20% for TB Pleural effusion & 36% for TB Lymphadenitis. Specificity was 100% as all the control subjects showed Negative ICT. TB.

Figure 1: Percentage of Pul & Extra Pul T.B. patients with positive antibody response along with non T.B. patients.

DISCUSSION

Tuberculosis is the major public health problem in Pakistan. An early and accurate diagnosis is necessary to reduce the morbidity and mortality of this disease. No single test can detect all cases of Tuberculosis. ICT-TB test is a valuable tool to diagnose TB in addition to chest X-Ray, sputum exam for AFB Culture & PCR.

Chang et al found the diagnostic sensitivity of ICT-TB as 73% and specificity in the range of 88-4%.[3] Other studies found that tests using the 38 KDA antigen had a sensitivity of 92% for sputum positive. 70% for sputum negative patient and 76% for extra-pulmonary tuberculosis while the overall specificity was 92%.[4]

Our study gave a specificity of 100% almost similar to the studies conducted so far, while the sensitivity in our study was 44% for smear positive patients, 36% for smear negative Pulmonary T.B, 20% for TB Pleural effusion & 35% for Tuberculous lymphadenitis. The sensitivity is low as compared to other studies due to the reason that some people show poor antibody production due to genetic variations & differences in study populations.[5-7]

CONCLUSION

We conclude that ICT test is highly specific but less sensitive test for diagnosis of tuberculosis, however in conjunction with other diagnostic techniques, it may serve as a valuable aid in clinical diagnosis for both Pulmonary and extra pulmonary TB. Further larger trials are needed for its evaluation.

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