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Takahashi's Antitubercle Phosphatide Kaolin Agglutination Test (KAT) in Extrapulmonary Tuberculosis

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Abstract : A sensitive serodiagnostic test would be of value in the diagnosis of extrapulmonary tuberculosis where the conventional confirmatory tests often need an invasive biopsy. The antitubercle phosphatide kaolin agglutination test (KAT) which has been shown to be of value in the serological diagnosis of pulmonary tuberculosis was investigated on 210 patients with extrapulmonary tuberculosis in comparison with 494 patients with pulmonary tuberculosis and 315 healthy blood donors. The KAT was found to be of no value in the diagnosis of extrapulmonary tuberculosis as the agglutinating titres were low and similar to those of blood donors.

1. Introduction

Takahashi's³ 'antitubercle phosphatide kaolin agglutination test' (KAT) has been studied by several investigators^{2,4,5} as a diagnostic test in pulmonary tuberculosis. The consensus is that it is of value in the diagnosis of pulmonary tuberculous disease. This simple and easily performed serological test may be of particular use in poor countries in which the current diagnostic tests for pulmonary tuberculosis are the more expensive X-ray and bacteriological examinations.

The diagnosis of extrapulmonary tuberculosis on the other hand often requires an invasive biopsy, usually done under general anaesthesia. Thus a reliable serodiagnostic test, if available, would be of value in the diagnosis of extrapulmonary tuberculous disease. This study was done to assess the value of the KAT in the diagnosis of extrapulmonary tuberculosis.

2. Experimental

2.1 The reagents

The test reagents (tris buffer, kaolin suspension and methanolphosphatide antigen) were obtained from the manufacturers of the test kit (Messrs Daichi Seiyaku Co., Tokyo, Japan) and the test was done as prescribed by the manufacturers and as reported in our earlier study of patients with pulmonary tuberculosis.²

2.2 The test

Buffered saline alone instead of diluted serum was used with each batch of tests as the suspension control, while a known positive control serum (from rabbits) supplied with the kit, with an antiphosphatide agglutinating titre of over 1 : 512 was used as the positive control.

2.3 The patients

The patients (n = 210, Table 1) examined were those undergoing treatment at the Chest Clinics in Kandy and Colombo, for extrapulmonary tuberculosis, which was diagnosed by biopsy and histological examination in the majority (80%) of patients. The reactivity of their sera was compared with that in patients with active pulmonary tuberculosis (n = 494) and in healthy blood donors (n = 315). Sera were stored at -20°C pending use.

TABLE 1. Diagnostic categories of the 210 patients with extrapulmonary tuberculous disease.

Disease	Number of Patients
Tuberculous adenitis	148
Bone and joint tuberculosis	20
Tuberculous enteritis and peritonitis	18
Genito-urinary tuberculosis	9
Tuberculous meningitis	8
Tuberculous pericarditis	2
Tuberculous mastitis	2
Tuberculous adenitis and peritonitis	2
Tuberculous meningitis and adenitis	1

3. Results

The frequency distribution of antitubercle phosphatide agglutinating titres in sera from patients with extrapulmonary tuberculosis is shown in Figure 1 in comparison with that in patients with pulmonary tuberculosis and in the blood donors. The KAT titres in patients with extrapulmonary tuberculosis were low in contrast to those in patients with pulmonary tuberculosis and resembled those in blood donors.

4. Discussion

In a study of the bacteriology of tuberculous adenitis in South India,¹ *Mycobacterium tuberculosis* was isolated from 100 out of 101 cases (99%) with *Mycobacterium scrofulaceum* having been isolated from only 1 case. Similar results have been obtained in Sri Lanka (Pinto, unpublished data), suggesting that non-tuberculous mycobacteria are uncommon in adenitis. Thus it is unlikely that the preponderance of non-reactivity and low titres in patients with adenitis, was due to non-tuberculous mycobacterial disease.

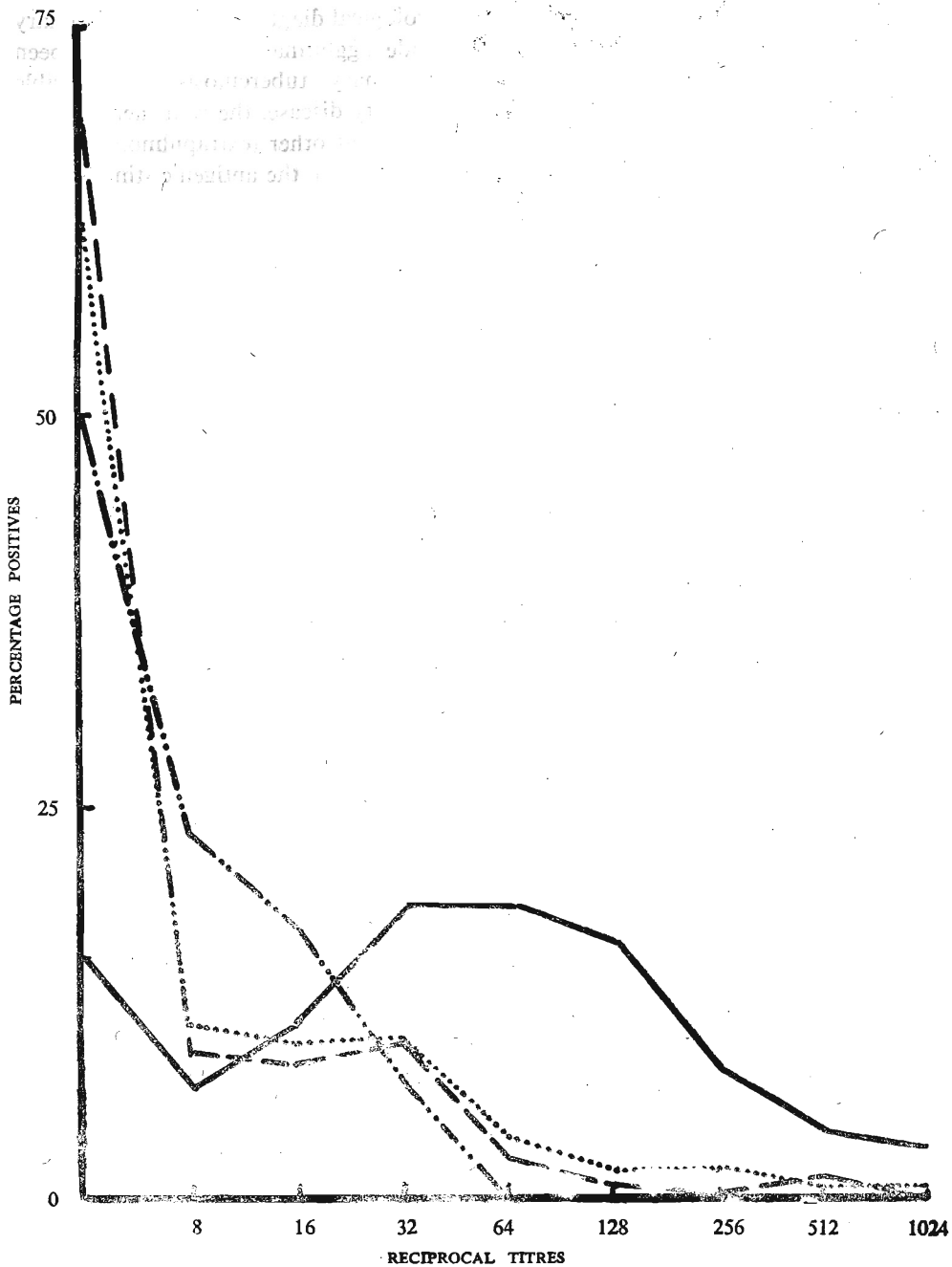


Figure 1. The frequency distribution of antitubercle phosphatide agglutination titres in 210 patients with extrapulmonary tuberculosis (.....), 148 patients with tuberculous adenitis (-----) 494 patients with pulmonary tuberculosis (————) and in 315 healthy blood donors (— · — · —)

The KAT appears to be of no value in the serological diagnosis of extrapulmonary tuberculous disease, the antitubercle phosphatide agglutinating titres having been lower than those in patients with active pulmonary tuberculosis. A possible explanation for this discrepancy is that in pulmonary disease, the well aerated pulmonary tissue carries a higher bacillary load whilst at other (extrapulmonary) sites the bacillary load is lower with a consequent reduction in the antigenic stimulus and the resultant antibody response.

Acknowledgement

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