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Original Research Article

# Evaluation of Mountex Test in Children of Different Age Group in North Karnataka Population

**Madhu Nadagouda[1], Anjana S Mavinahalli[2], Pooja Amble[3]**

[1]Assistant Professor, Department of Pediatrics, ESIC Medical College Kalahurgi-585106
[2]Senior Resident, Department of Pediatrics, ESIC Medical College Kalahurgi-585106
[3]Senior Resident, Department of Pediatrics, ESIC Medical College Kalahurgi-585106

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**Corresponding Author: Dr. Pooja Amble**
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**Abstract:**

**Background:** Tuberculosis in children is a chronic infectious disease caused by Mycobacterium tuberculosis. The latest technique is an ideal method to rule out TB positivity.

**Method:** 90 (ninety) children with TB positivity were made to undergo a Mountex test and sputum for AFB. Blood examinations included CBC, ESR, and chest X-rays to confirm the findings of the Mountex test.

**Results:** 58 (64.4%) children had tuberculosis, and 32 (35.7%) had disease relieved by symptomatic and antibiotic treatments. 48 (53.3%) children were 4–9 years old, 12 (13.3%) were 10–12 years old, and 30 (33.3%) children were aged between 13-18 years old.

**Conclusion:** The Mountex study, along with CBC, ESR, sputum for AFB, and chest X-ray will certainly help the pediatrician treat such cases efficiently to avoid morbidity and mortality in children.

**Keywords:** Mountex Test, Sputum for AFB, Chest X-ray, Mycobacterium Bacillus Lymphadenopathy.



## Introduction

Tuberculosis (TB) is a chronic infectious disease caused by Mycobacterium tuberculosis and one of the major diseases affecting children throughout the world. Prevalence of active disease in adults in India is 18 percentages per 1000 population [1]. In children, the clinical features are vague and non-specific symptoms, including a 1000-grade fever for > 2 weeks, loss of appetite, poor weight gain, recent weight loss, night sweats, a dry cough for > 2 weeks, and significant lymphadenopathy.

About 25–35% has extra pulmonary tuberculosis. The ratio is 3:1 [2]. The diagnosis of TB in children is still a challenge for pediatricians.

Severe malnutrition, absence of BCG vaccination, and younger age are significant risk factors for the transition of infection [3]. The majority of children will present with symptoms within one year of infection [4]. Hence, an attempt was made to evaluate the various signals and symptoms to rule out the positivity of TB with the help of mauntex tests and hematological and radiological studies.

## Material and Method

90 (ninety) children aged between 4-18 years who regularly visited the pediatric OPD ESIC Medical College Hospital in Kalaburgi, Karnataka-585103 were studied.

**Inclusive Criteria:** persistent fever > 2 weeks, low weight for age (< 80% of expected recent weight loss of 10%) persistent coughs > 2 weeks, significant lymphadenopathy, positive contact history.

**Exclusion Criteria:** Children with recent vaccinations or recent viral illnesses prior to Mountex positivity were excluded from the study.

## Method

SPAN's tuberculin PPD was used in the current study. It is a diluted and ready-to-use solution for performing the Mountex test. The material was manufactured by Staten's Serum Institute in Denmark. It is dilated with a buffer. Tween 80 as a stabilizer.

Every child was given 0.1 ml of ITUPPD intadermally over the mid-volar aspect of the left forearm using tuberculin Syrange after cleaning the area with spirit. A plastic disposable tuberculin syringe with a 27-gauge needle was used. The skin of the arm is lightly stretched lengthwise, and the pointer of the needle is inserted lengthwise, with the bevel upwards, intradermally. After injection, the appearance of a pale wheel of 6–10 mm was taken as correct intradermal administration. Caretakers and children were educated not to wipe, scrub, massage, or apply cream over the test site.

They were specially advised about the importance of reporting within 24 hour and 48 hours of reading the test. The transverse diameter of the indurations was palpated and marked by the ballpoint pen technique (sokal method) and measured with a transparent ruler in mm by the same observer in all cases. The blood examination included CBC and ESR sputum for AFB. A chest X-ray was also studied to confirm the tuberculosis. The duration of the study was from July 2023 to April 2024.

**Statistical Analysis:** disease was determined by the distribution of positive Mountex tests, and the distribution of cases according to age groups was classified by percentage. The statistical analysis was carried out in SPSS software. The ratio of male and female children was 2:1.

**Observation and Results**

**Table 1:** Disease-wise distribution of positive Mountex tests: 58 (64.4%) had tuberculosis, and 32 (35.5%) had disease relived by symptomatic and antibiotic treatment.

**Table 2:** Distribution of cases according to age group 48 (53.3%) were aged between 4-9 years, 12 (13.3%) were between 10-12 years of age, and 30 (33.3%) were aged between 13-18 years.

**Table 1: Disease wise distribution of positive mountex test (Number of patient: 90)**

| Sl. No | Details | No. of patients (90) | Percentage (%) |
|---|---|---|---|
| 1 | Tuberculosis | 58 | 64.4 |
| 2 | Disease relieved by symptomatic and antibiotic treatment | 32 | 35.5 |

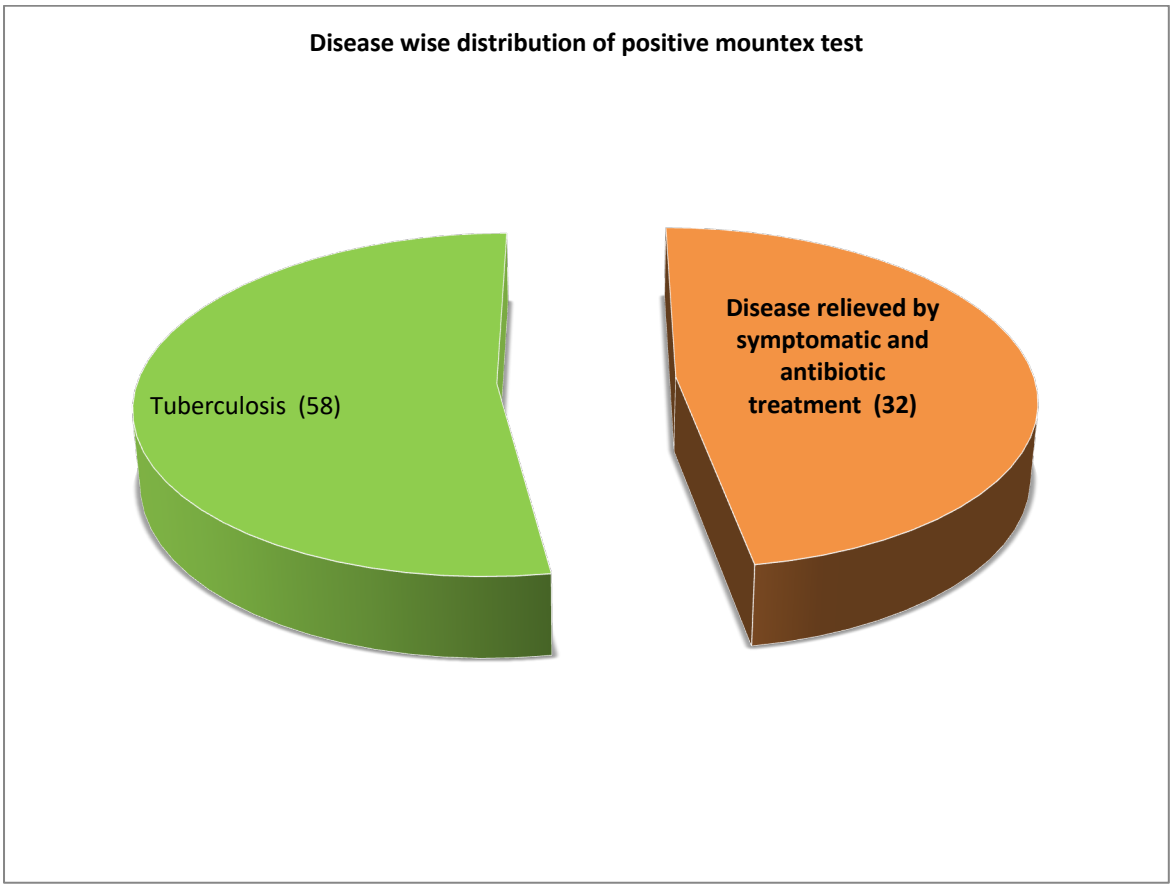


**Figure 1: Disease wise distribution of positive mountex test**

**Table 2: Distribution of cases according to age group (Number of patient: 90)**

| Sl. No | Age group | Total No. of patients (90) | Percentage (%) |
|---|---|---|---|
| 1 | 4-9 years | 48 | 53.3 |
| 2 | 10-12 years | 12 | 13.3 |
| 3 | 13-18 years | 30 | 33.3 |

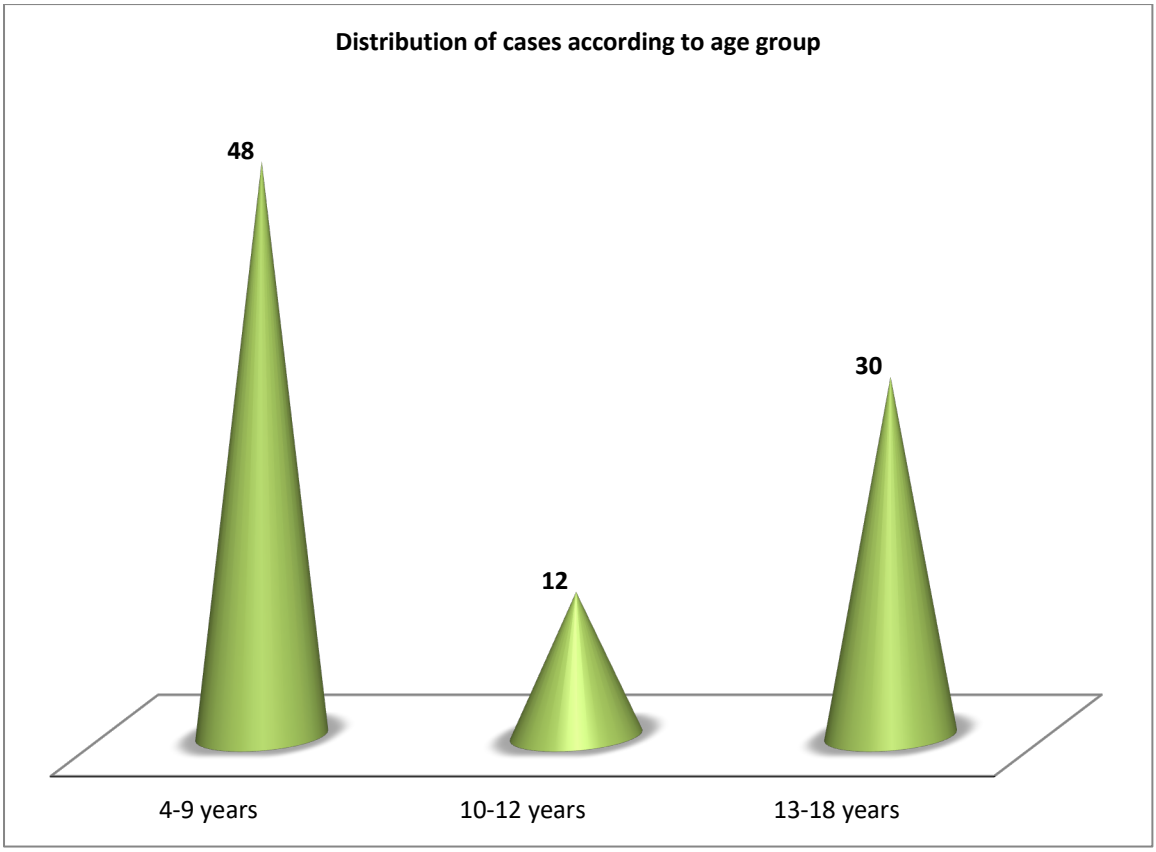


**Figure 2: Distribution of cases according to age group**

## Discussion

Present study of the mountex test in children of different age groups in the North Karnataka population. In the disease-wise distribution of positive Mountex tests, 58 (64.4%) children had TB, and 32 (35.5%) had disease relived by symptomatic and antibiotic treatment (Table 1). In the distribution of cases according to age group, 48 (53.3%) children were aged between 4-9 years, 12 (13.3%) children were between 10-12 years of age, and 30 (33.3%) children were aged between 13-18 years (Table 2). These findings are more or less in agreement with previous studies [5,6,7].

Interpretation of the Mountex test is difficult because it is neither sensitive nor specific, with high false positive and false negative results. Hence, the diameter of the induration was measured correctly. Regarding ATT, (anti-tuberculosis treatment) decision was taken considering all the factors together [8].

In the suggested mountex test (MT) has to be interpreted carefully, and one should also be aware of unusual presentations like exaggerated mountex reactions. Patients should be kept under observation. The interpretation of the results becomes difficult as various medications use different duration sizes to indicate a positive reaction. The tuberculosis skin test persisted in wide-spread use due to its low cost and simplicity of administration and administration. But the results of this test indicate that BCG-vaccinated children may have to be treated with caution to avoid over diagnosis of TB and unnecessary treatment with anti-tuberculosis treatment (ATT).

The tuberculin test is a diagnostic tool with high sensitivity and specificity for detecting TB infection, where cellular immunity provides protection against infection [9]. The analysis of the test is complicated by cross-sensitivity induced by environmental mycobacterium or BCG vaccination, or a typical mycobactorial infection. Not all reactions to tuberculin are inferable to infection with tubercular bacilli [10]. It is also reported that BCG given at birth does not conflict with TST and may cause a false positive TST result [11].

The reaction with induration of < 5mm diameter usually indicates a lack of tuberculin sensitivity and the absence of infection either with tuberculin bacilli or environmental bacilli, but patients suffering from a severe degree of immune suppression may also show induration in this range (5 mm) or more positive in children with recent contact with TB patients.

HIV positive case, patients with organ transplants, immune-suppression patients, and patients with fibrotic or nodular changes in chest-X-ray consistent with old-healed TB or the end stage of renal disease. The Mountex test is technically difficult to

administer and read, so false reading may occur if the tester has insufficient skill. It may require four visits by the patient if a two-step test is performed, and compliance with this is sometimes difficult. It is reported that among healthy children, the predictive value for induration greater than 10–15 mm at 24 hours was estimated at 96.70% and 99.50%, respectively.

**Summary and Conclusion**

It is concluded that the Mountex test can aid in an early and more reliable diagnostic clue for pediatric TB. But the Mountex test cannot be the gold standard method for the diagnosis of TB in children; hence, sputum for AFB, raised ESR, lymphadenopathy, and chest x-ray can together finalize the diagnosis of TB in children.

**Limitation of study:**

Owing to the tertiary location of the research center, the small number of patients, and the lack of the latest techniques, we have limited findings and results.

This research paper has been approved by the ethical committee of ESIC Medical College Kalaburgi, Karnataka-583106.

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