DISCUSSION
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Tuberculosis is one of the important public health problems of India has several special features. Several epidemiological fields works in last few decades have revealed, these features. Further elucidation are still needed for this problem.

The present study comprised of 120 children of 0-12 years of age having a positive relevant clinical findings, mantoux positive and radiologically positive cases were taken into account.

A mantoux test with 1 T.U. P.P. Dof RT 23 timer 80 strength was performed in all 120 cases. Children showing tuberculin reaction more than 10 mm. induration in transvers diameter after 72 hours were considered positive cases.

In present study, 120 cases of 0-12 years of age were taken. About 6% of children of families taken in study did not co-operate even though they were offered free services, so they were dropped out. As regarding mantoux test about 3% of cases did not turn up after hours, they also were dropped out.

Radiological examination of children despite of repeated attempts skiagram of about 1% children were
technically defective due to faulty technique and developing solution, they could not be interpreted, they therefore, were discarded.

In present study the incidence of pulmonary tuberculosis was found to be highest 33.33% in age group 1-3 years, and second highest 31.67% in children of 3-5 years age group. Kotaiah (1958) published his study of primary pulmonary tuberculosis in 195 cases at Visakha-patnam. He observed that highest incidence 88.20% of tuberculosis in children higher age group 10.15 years, and 11.80% in below three years of age, 98% of his cases were mantoux positive. Manchanda et al. (1966) reported 215 cases from Amritsar, and found higher incidence in 5-10 years age group. Prakash et al (1963) observed 273 tuberculin positive children at Lucknow and found the incidence of 10.8%, 32.6% and 40.7% among 0-3 years, 3-7 years and 7-12 years. In 1966 Ramchandran and Puranayyan from Tanjavur presented an analytical study of 365 children. They found that the maximum incidence was 46.8% amongst 0-2 years age group.

The incidence of primary tuberculosis was found to be higher in comparison to other workers. This could be because of the observed higher prevalence of disease in
general in the present study. Secondly the criteria particularly about the selection of cases may be different in studies of other workers. However, this is confirmatory with observation in our present study and also by different workers that the younger child (below 5 years of age) are more prone to develop disease.

Higher pulmonary tuberculosis under 5 years can be explained with on the basis of their early susceptibility to harbour the infection. Other contributory factor could be close proximity and sharing of food stuff with the index cases, who in most of cases was either of parents. Secondly they are more prone to develop disease because of poor immunity to tuberculosis (P.M. Udani and K.A. Krishnamurthy and J. Vishwanathan, 1972).

The percentage of male and female children in our study was 64.17% and 35.83%. The sex percentage was not significant in the prevalence of disease but higher percentage of cases were noted in male child. The higher percentage in males is higher age group, was due to their greater degree of outdoor activities and thus having a greater chance of being exposed to infection. Secondly, they may have come in contrast with some unknown, undiagnosed open case of tuberculosis regarding which history could not be obtained.
Generally it is believed that tuberculosis is a problem of poor people. It holds true to a large extent due to difference in standard of living, nutritional status, overcrowding, poor general hygiene etc. In the present study, most of the children were from the low socio-economic group. High prevalence of infection was found in children of low socio-economic status. Karen (1964) also observed that poor socio-economic children are slightly more afflacted than well to do families.

According to Benjamin (1957), the standard of living is directly proportional to incidence to tuberculosis. Pamra & Mathur (1968) in a survey among the Delhi civil servant reported that the prevalence and incidence of tuberculosis in low socio-economic status was nearly 3 times more than middle income group.

The explanation for higher prevalence of tuberculosis in children from low socio-economic status may be given on basis of aforesaid factors. Other contributory factor could be higher prevalence of tuberculosis in adult population. In poor community, including ignorance, lack of child care and various environmental factors.

In our study we did mantoux test in 188 clinically suspected cases of primary tuberculosis. 166 were turned up after 72 hours, and only 132 were positive. Out of 132 only
in 120 cases, there was radiologically evidence of primary pulmonary tuberculosis. In our present study radiological finding were as follows:

Hilar adenitis 73.33%, paratracheal adenitis 41.67%, lymphangitis 70.83%, mottling 54.17%, consolidation 11.67%, collapse 6.67%, pleural effusion 6.67%, cavitation 5% and pleural thickening 3.33%. As forementioned most common radiological presentation of primary tuberculosis in our study was Hilar adenitis followed by Lamphangitis and Mottling.

A study was conducted by Ramchandran (1976) in which he studied 3000 for radiological evaluation of primary tuberculosis. The criteria for registration was:

1. Suspicious symptoms including repeated respiratory tract infection, chronic diarrhoea and failure to thrive.
2. Mantoux positivity.
3. Radiological positivity in chest X-ray.

Out of 3000 children registered, 1630 X-rays only were available for study. Radiological finding of these X-ray as follows:

No X-ray finding in 263 (16.13%), intrathoracic lymphnodes only 527 (32.33%), intrathoracic lymphnode with
infiltration 309 (18.95%), lymphanodes with multiple infiltration 86 (5.27%), miliary tuberculosis 86 (5.27%), others 164 (10.06%).

Bently and Gribowski (1954) reported that out of 317 children with uncomplicated primary complex 115 had a parenchymal focus and 202 had only lymphadenopathy.

In a study of 538 children (Walker, 1958), primary complex were seen in 280 cases (mottling with hilar adenitis), primary cavitation in 5, broncho-pneumonia in 3 and miliary tuberculosis 60 cases.

Manchanda et al (1966) reported their observations on 225 children, 43 cases were found to have primary complex, 86 cases were found to have lymphanopathy, collapse were in 4 cases, consolidation in 11 cases, bronchopneumonia in 2 cases, pleural effusion in 5 cases, middle lobe syndrome in 2 and cavitation in 1 patient.

Dinglay (1966) conducted a study and found that out of 500 cases of primary tuberculosis 260 had glandular involvement and 28 cases had primary complex, consolidation in 170 cases, collapse in 37 cases, pleural effusion in 56 and calcification in 5 cases.
<table>
<thead>
<tr>
<th>Workers</th>
<th>Mottling</th>
<th>Glandular involvement</th>
<th>Consolidation</th>
<th>Collapse</th>
<th>Cavitation</th>
<th>Millary tuberculosis</th>
<th>Other</th>
<th>Pl. Eff.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramchandran (1975)</td>
<td>18.95</td>
<td>56.56</td>
<td>8.93</td>
<td>-</td>
<td>-</td>
<td>10.06</td>
<td>1.53</td>
<td></td>
</tr>
<tr>
<td>Santly &amp; Grybowski (1954)</td>
<td>36.28</td>
<td>63.72</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Walker (1958)</td>
<td>30.26</td>
<td>52.04</td>
<td>-</td>
<td>0.90</td>
<td>11.15</td>
<td>5.90</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Manchanda (1966)</td>
<td>19.11</td>
<td>38.22</td>
<td>4.88</td>
<td>1.77</td>
<td>0.40</td>
<td>-</td>
<td>1.70</td>
<td>2.20</td>
</tr>
<tr>
<td>Dinglay (1966)</td>
<td>5.60</td>
<td>52.00</td>
<td>34.00</td>
<td>7.40</td>
<td>-</td>
<td>1.00</td>
<td>11.20</td>
<td></td>
</tr>
<tr>
<td>Sharma, K.P. (1968)</td>
<td>38.04</td>
<td>78.26</td>
<td>19.56</td>
<td>-</td>
<td>-</td>
<td>47.82</td>
<td>7.50</td>
<td></td>
</tr>
<tr>
<td>Present study</td>
<td>54.16</td>
<td>73.32</td>
<td>11.66</td>
<td>6.66</td>
<td>5.00</td>
<td>-</td>
<td>70.83</td>
<td>6.66</td>
</tr>
</tbody>
</table>

* Other includes following radiological features:— lymphangitis, pleural thickening, interlobular effusion, middle lung syndrome, bronchopneumonia, calcification etc.

** Pl. Eff. — Pleural effusion.
In our study most common radiological presentation of primary tuberculosis was glandular enlargement 73.33%. It was more common on right side 55% and left side 40%. It is slightly higher than other studies.

Ramchandran (1976) found only glandular enlargement in his study was 51.28%. The various groups of lymphanodes involvement reported as follows - Superior mediastinal adenitis 21 cases (13.19%), right hilar adenitis 168 cases (10.12%), left hilar adenitis (2.20%), bilateral hilar adenitis 53 cases (3.25%) and all glands 58 cases (3.55%).

We found only glandular enlargement (hilar adenitis) in 35 cases (29.17%) in which 25 were in right lung (20.83%), 10 were in left lung (8.33%), and bilateral 10 cases (8.33%).

Right side glandular enlargement is more common in primary tuberculosis. In assessment of hilar shadows specially on the right side many more pitfalls are possible eg. a child with acute infection or recurring from upper and lower zone respiratory tract infection or from measles or whooping cough or those with heart lesion and left to right shunt, the left hilar nodes usually escapes alteration because of their retrocardiac location but slightly over exposed film will bring them up more clearly.
Ramchandran (1976) found in his study primary complex (lymphadenopathy with parenchymal infiltration) in 309 cases (18.95%). In majority of cases infiltration was in right upper lobe and lymphnode was often superior mediastinal or right hilar. Milar (1963) reported that in his series of 525 children with a primary complex only in 16%. Walker (1958) in his study found 280 cases of primary complex out of 538 cases (52.04%). Manchanda et al (1966) reported 43 cases of primary complex out of 225 children (19.11%).

We found in our study that out of 120 cases typical primary complex was seen only in 43 cases (35.83%) out of which 38 were in right lung, 15 were in left lung and 14 cases were bilateral. Zone wise distribution of primary complex was as follows -

**Table - II**

Showing zone wise distribution of primary complex

<table>
<thead>
<tr>
<th>Zone-wise</th>
<th>Right lung</th>
<th>Left lung</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper zone</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>Middle zone</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>Lower zone</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
Similar to other workers, we found in our study that primary complex is more common in the right side in comparison to the left side and often involves the right upper lobe in comparison to the middle and lower lobe. The parenchymal infiltration is usually single seen anywhere in the lung fields and on a few occasions infiltration are seen on one side where as lymphadenitis is on the opposite side. We consider opacities which are not in time with or related to a bronchial or vascular marking as suggestive of tuberculous infiltration.

We, in our study, found radiographic linear shadows in between mottling and lymphadenopathy. It was actually lymphangitis. In 85 cases (70.83%) out of 120 cases we noted lymphangitis. In many cases lymphangitis helps to locate the Ghon's focus and many cases Ghon's focus was not seen and only lymphangitis was seen. The incidence of lymphangitis in our study was much higher in comparison to other studies. K.P. Sharma (1988) found lymphangitis denoted as diversion of blood vessels in 31 cases out of 92 cases.

In our present study we observed consolidation in 14 cases, most of them were on the right side 10 cases and 4 cases were on the left side. We considered it tubercular consolidation after administration of antibiotics for 7
days to see whether consolidation clears. Out of 14 cases consolidation, 10 were in right lung and 4 were in left lung. Ramachandran (1976) found 134 cases of consolidation (8.93%) and mostly was in right lung. Manchand (1966) reported 11 cases of consolidation out of 225 cases and mostly were in right lung. Dinglay (1966) observed consolidation in 170 cases out of 500 cases. K.P. Sharma (1988) observed 18 cases (19.56%) of consolidation mostly on right side.

We observed pleural effusion in 8 cases (6.67%), equally distributed in both sides. It was more common in male and 1-3 years children were more involved. Ramachandran (1976), observed 23 cases (1.53%) of pleural effusion. He observed no predilection for occurrence of effusion on any one side effusion. Manchanda (1966) reported 5 cases (2.22%) of pleural effusion and mostly were on right side. Dinglay (1966) reported 56 cases (11.2%) of pleural effusion and mostly were on right side.

Ramachandran (1976) observed that pleural effusion on X-ray examination is described as a curved shadow, it is more often a horizontal line in children due to fluid in inter-lober septum or to co-existing segmental lesion. Quite often the pleural effusion was revealed by a
vertical line following the attachment of parietal pleural
to the apex of the lung.

We noted collapse, including compression collapse
and absorption collapse, in 8 cases (6.67%) more in male
6 cases and 2 in female. They were equally distributed.
Collapse was more common in 3-10 years of age group
children, out of 8 cases 3 cases were of compression
collapse due to hydropneumothorax and 5 cases were of
absorption collapse. In absorption collapse mostly were
of upper lobe collapse on right side. Manchanda (1966)
reported of 4 cases (1.77%) of collapse out of 225 cases.
Dinglay (1966) observed collapse in 37 (7.4%) out of 500
cases and mostly were on right side.

We observed cavitation in 6 cases (5%), 4 were
in right lung and 2 were in left lung. Cavitation was
more common in 3-10 years male child and mostly found in
middle and upper lobe of right lung. Manchanda (1966)
observed one case (0.4%) of cavitation out of 225 cases
of primary tuberculosis.

We observed pleural thickening in only 4 cases
(3.33%). It has more common in male and equally
distributed on both sides, 2 cases in right lung and
2 cases in left lung.
A Govindan and R. Narmoda (1976) conducted a study and observed that in 1,140 cases out of 1,500 the pleural thickening was seen giving an our all percentage of 76%. Further 945 out of 1,140 cases (i.e. 63%) had a positive mantoux test and in only 195 cases (13%) the mantoux test was negative as shown in table - III.

**Table - III**

Showing result of Mantoux Test

<table>
<thead>
<tr>
<th>Total no. of cases</th>
<th>Mantoux result</th>
<th>No. of cases with pleural thickening</th>
<th>No. of cases without pleural thickening</th>
</tr>
</thead>
<tbody>
<tr>
<td>1500</td>
<td>Positive</td>
<td>945</td>
<td>-</td>
</tr>
<tr>
<td>1500</td>
<td>Negative</td>
<td>195</td>
<td>-</td>
</tr>
<tr>
<td>1500</td>
<td>Positive</td>
<td>-</td>
<td>360</td>
</tr>
</tbody>
</table>

We conducted mantoux test in 188 children clinically suspected primary tuberculosis. Only 166 were turned up after 72 hours and out of 166 only 132 (79.51%) were positive i.e. induration was more than 10 mm after 72 hours. All the 166 children were examined radiologically for evidence of primary tuberculosis. Out of 132 cases mantoux positive in 120 (90.90%) cases, there were evidences of primary tuberculosis in one or other way. In 12 cases where there is no radiological evidence of P.T., they must be suffering from GIT tuberculosis or
ether form of tuberculosis. A. Govindan & R. Narmada (1976) conducted a study, they did mantoux test in 1500 clinically suspects children and observed mantoux positive in 1305 cases (87%) N.R. Bhandari (1984) conducted a study comparison between B.C.G. test and mantoux test, observed that in proved 165 cases only in 78 cases (47.27%) mantoux test was positive.

Negative mantoux test in radiologically proved primary tuberculosis can be explained as these children were either marasmic or under steroid therapy. These may faulty technique causing negative test.

In our study we observed that incidence of primary tuberculosis is much higher than study conducted done by other workers. It can be explained very well as in Bundelkhand mostly people are uneducated, living in very poor environment, have low socio-economic status. Hilar adenitis in the most common radiological presentation of primary tuberculosis. The percentage of hilar adenitis, mottling and lymphangitis is higher in our study in comparison to other worker. The difference may be due to selection of cases and mode of study may be different in their study.

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