Original Research Paper

Tuberculous Lesions at Autopsy

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Abstract

Tuberculosis (TB) today remains one of the world's most lethal infectious diseases. Despite the availability of effective treatment for most cases, tuberculosis is still a cause of death in our environment. Some cases of active tuberculosis are not identified until after the patient had died and an autopsy has been performed. This study was done to determine the prevalence of tuberculosis in autopsy cases. We analysed all the autopsy cases sent for histopathology over a period of one month. 8.7% cases of active tuberculosis were found in autopsy specimens, of which 60% were males. Tuberculosis was suspected in only 40% of patients before death. Tuberculosis is not an uncommon finding at autopsy for most of autopsy surgeons, but as the cause of death it is not so common. The presence of unspecific symptomatology, insufficient cost-effectiveness of the diagnostic tests and precocious death, are identified as the most frequent causes of undiagnosed tuberculosis. Awareness of tuberculosis and its high prevalence in India is essential for minimising missed diagnoses. Absence of suspicion and delayed diagnosis mean increased risk in health care and at autopsy.

Key Words: Tuberculosis, Autopsy, Pulmonary, Granuloma, Intestine

Introduction:

Tuberculosis is still a relevant infectious disease, which is often not diagnosed during the lifetime of a patient. India is home to over 3.4 million tuberculosis patients - about one-fifth of the global figure - making it the most TB prevalent country. 325172 people in India had died of the disease in 2005 alone. In 2006, India recorded 1.9 million new cases. Across the globe, there were 9.2 million new cases of TB during the same period. Of all fresh cases in the country, 1.2 % is infected with HIV and 2.8 % of all new cases have been diagnosed with multi-drug resistant TB. Against all these figures, 30 % of the cases are not even detected in the country. [1] Unlike other countries, it is not mandatory in India for doctors to report TB cases.

Methods:

We analysed all the autopsy cases sent to the Pathology department of PGIMS Rohtak over a period of one month.

The complete Post-Mortem report were accessed and analysed. Basic demographic data such as the deceased's age, sex and available medical history were recorded.

The gross and histopathological findings were recorded. The cases of tuberculosis were again confirmed by Ziehl-Nielson stain.

The aim of the study was to investigate the frequency of tuberculosis in autopsy cases. The results were compared with the studies done by other authors. The main area of interest was to ascertain the proportion of cases of tuberculosis which were not diagnosed during life, in other words, cases which were not expected. We examined the possible reasons why this may have occurred. Further the issue how this could affect medical staff and also the public health was also looked into.

Observations:

Out of a total of 115 autopsy case samples received for histo-pathological examination over a one month period, we found 10 cases (8.7%) of active tuberculosis, 60% corresponding to men. Mean age of this group was 38 years. Tuberculosis was suspected in only 40% of patients before death. Principal cause of death was tuberculosis in 30% of patients, 90% of patients had pulmonary tuberculosis, 10% suffered from miliary tuberculosis and 30% had extra-pulmonary tuberculosis. The lungs were the most frequently affected organ. Caseous epithelioid granulomas
were found in all patients, however only 2 cases were positive for Acid-fast bacilli in ZN stain.

Of the 8.7% cases showing relevant tuberculosis, lung involvement was grossly present in 7 cases. Of these, 2 showed acinar nodal foci, 4 showed early cavities and 1 had caseous pneumonia. One case showed scarring, effusion and pleural adhesions. Table 1 summarizes the findings of the cases positive for tuberculosis.

**Fig 1: Adhesions and pleural effusion in left lung at autopsy in a female**

**Fig 2: H&E stain of lung revealing multiple caseous epitheloid granuloma**

**Fig 3: H&E stain of small intestine showing epitheloid granuloma**

**Fig 4: H&E stain of liver showing changes of fatty liver and epitheloid granuloma**

**Discussion:**

The morbidity and mortality of tuberculosis has decreased tremendously in developed countries but is found to exist still in higher rates in developing countries and especially among the populations of low socio-economic status.

Our study shows that a large proportion (60%) of cases of tuberculosis found at autopsy are unexpected. Several similar studies have shown that many cases of tuberculosis were diagnosed only at autopsy, when awareness of possibility of the disease is low. There are several reasons to know why the diagnosis is missed or delayed. As per Table 2, large studies, conducted all over the world, looking at the frequency of undiagnosed tuberculosis at autopsy, similarly found high rates. Reasons range from symptomatic patients not seeking medical attention, to doctor not investigating the possibility of tuberculosis despite suspicious symptomatology. Occasionally the diagnosis is delayed or missed because the doctor did not enquire about exposure to tuberculosis and patient did not volunteer that information. Occasionally doctor does not consider the diagnosis because of concurrent illness that can produce symptoms that are indistinguishable from tuberculosis.

Active tuberculosis today is becoming a disease of elderly and is attributable mainly to recurrence of dormant infection and decrease in immune status of elderly. There is a tendency to confuse tuberculosis with lung carcinoma in adults because of high incidence of both the disease in upper lobe of lung and also both these disease presents clinically in a similar fashion. In our study 2 cases were over 50 years of age. Most of chest radiographs are mis-diagnosed. The lesions in lung are diagnosed mostly as pneumonia or as primary and secondary malignancy. In cases were pleural effusion is present, it is important to perform pleural tap in order to confirm diagnosis.
of malignancy (cytology) and to demonstrate mycobacterium tuberculosis (acid fast stain) in active tuberculosis.

Tuberculosis of Gastro-intestinal tract is difficult to diagnose because symptoms of disease mimics many other abdominal conditions; and laboratory and radiological investigations usually do not contribute any helpful data. So tuberculosis should be included in the differential diagnosis of any unusual gastro-intestinal conditions. In our study 2 cases (20%) had gastrointestinal tuberculosis.

Military tuberculosis was found in single case. The lesions were distributed in lung, liver, kidney, intestine, ovary and mesenteric lymph nodes. These cases who presents with symptoms of fever, loss of weight, cachexia are usually suspected of having generalized malignancy.

The importance of diagnosis is that disease is curable, if diagnosed, but fatal if undiagnosed. An undiagnosed infective person is of epidemiological importance when he is in contact with person not immunised to the disease. There is evidence in literature to suggest that there are grounds for suspecting that the autopsy room might be a centre for dissemination for tuberculosis. Post mortem attendants might be exposed to risk, as many of them do not understand the elementary rules of hygiene, let alone the problem of bacterial contamination. Post mortem room is a source of potential hazard and risk, not only to doctors and technicians, but also to visitors to the mortuary and those handling body after autopsy.

Post mortem staff has ethical and legal responsibility to make themselves aware of, and to minimize these dangers. [15, 16] The upsurge of tuberculosis has been associated with HIV infection and immunodeficiency. It is therefore necessary to suspect and screen all tuberculosis patients for possible HIV positivity. Absence of suspicion and delayed diagnosis mean increased risk in health care and at autopsy. Staffs of laboratories and autopsy rooms are estimated to be between 100 and 200 times more likely than the general public to develop tuberculosis. [17]

Primary tuberculosis accounts for approximately 90% of cases and is acquired by inhalation of aerosols or dried material. Cutaneous infection accounts for 5–10% of cases, the bacillus being introduced into previously traumatised skin or via a skin puncture. Muco-cutaneous transmission of tuberculosis at autopsy has not been reported. [16]

**Conclusion:**

Tuberculosis causes unnecessary death, because of failure to diagnose and treat, what is today a curable disease. There is a need for more awareness of the disease, especially in the light of recent reports showing a growing incidence of extra-pulmonary tuberculosis. The risk of unrecognized tuberculosis not only extends to public but also to the health professional. Measures to minimise the risk to mortuary staff include the use of proper respiratory masks and performing the autopsy in the infection suit, which isolates the body and minimises exposure to staff. [9] Autopsies are still indispensable for providing quality control and disease statistics.

**References:**

Table 1

Findings of the tuberculosis positive cases out of 115 autopsy specimens received over a month

<table>
<thead>
<tr>
<th>No.</th>
<th>Age</th>
<th>Sex</th>
<th>Cause of death</th>
<th>Tuberculosis</th>
<th>Other findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>22</td>
<td>Female</td>
<td>Illness</td>
<td>Lung, Intestine, Liver, Kidney, Ovary, Mesenteric lymph nodes</td>
<td>Fatty liver</td>
</tr>
<tr>
<td>2</td>
<td>28</td>
<td>Male</td>
<td>TB</td>
<td>Lung</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
<td>Female</td>
<td>Illness</td>
<td>Lung</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>30</td>
<td>Female</td>
<td>Maternal</td>
<td>Ovary, Fallopian tubes</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>32</td>
<td>Female</td>
<td>Heart attack</td>
<td>Lung</td>
<td>Atherosclerosis</td>
</tr>
<tr>
<td>6</td>
<td>40</td>
<td>Male</td>
<td>-</td>
<td>Lung</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>42</td>
<td>Male</td>
<td>Illness</td>
<td>Lung</td>
<td>Cirrhosis</td>
</tr>
<tr>
<td>8</td>
<td>44</td>
<td>Male</td>
<td>-</td>
<td>Lung, Spleen</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>55</td>
<td>Male</td>
<td>-</td>
<td>Lung</td>
<td>Fatty liver, Atherosclerosis</td>
</tr>
<tr>
<td>10</td>
<td>60</td>
<td>Male</td>
<td>Heart attack</td>
<td>Lung</td>
<td>Myocardial infarction</td>
</tr>
</tbody>
</table>

Table 2

Comparison of Different Studies

<table>
<thead>
<tr>
<th>Author</th>
<th>Study year</th>
<th>Total</th>
<th>TB cases</th>
<th>TB cases %</th>
<th>Undiagnosed cases %</th>
<th>Place</th>
<th>Prevalence per 100000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post [2]</td>
<td>1955-1975</td>
<td>18724</td>
<td>811</td>
<td>4.33</td>
<td>56.9</td>
<td>Germany</td>
<td>-</td>
</tr>
<tr>
<td>Andron [3]</td>
<td>1969-1978</td>
<td>3195</td>
<td>61</td>
<td>1.91</td>
<td>70.0</td>
<td>Italy</td>
<td>-</td>
</tr>
<tr>
<td>Ebert [4]</td>
<td>1971-1985</td>
<td>3714</td>
<td>165</td>
<td>4.44</td>
<td>72.9</td>
<td>Germany</td>
<td>-</td>
</tr>
<tr>
<td>Chastanay [5]</td>
<td>1974-1989</td>
<td>-</td>
<td>-</td>
<td>1.90</td>
<td>44.0</td>
<td>France</td>
<td>-</td>
</tr>
<tr>
<td>Macgee [6]</td>
<td>1989</td>
<td>1911</td>
<td>66</td>
<td>3.46</td>
<td>56.1</td>
<td>Switzerland</td>
<td>-</td>
</tr>
<tr>
<td>Lee [7]</td>
<td>1986-1989</td>
<td>1306</td>
<td>63</td>
<td>4.82</td>
<td>61.9</td>
<td>Hong Kong</td>
<td>-</td>
</tr>
<tr>
<td>Rowinska [8]</td>
<td>1972-1991</td>
<td>1500</td>
<td>119</td>
<td>7.93</td>
<td>54.0</td>
<td>Poland</td>
<td>-</td>
</tr>
<tr>
<td>Lum [9]</td>
<td>1975-1992</td>
<td>13866</td>
<td>30</td>
<td>0.22</td>
<td>70.0</td>
<td>New Zealand</td>
<td>9</td>
</tr>
<tr>
<td>Theegarten [10]</td>
<td>1990-2004</td>
<td>3947</td>
<td>148</td>
<td>3.75</td>
<td>45.5</td>
<td>Germany</td>
<td>5</td>
</tr>
<tr>
<td>Flavin [12]</td>
<td>1991-2004</td>
<td>4930</td>
<td>15</td>
<td>0.30</td>
<td>67.0</td>
<td>Ireland</td>
<td>11</td>
</tr>
<tr>
<td>Ozsoy [14]</td>
<td>2008</td>
<td>302</td>
<td>3</td>
<td>0.99</td>
<td>-</td>
<td>Turkey</td>
<td>26</td>
</tr>
<tr>
<td>Present study</td>
<td>2010</td>
<td>115</td>
<td>10</td>
<td>8.70</td>
<td>60.0</td>
<td>India</td>
<td>283</td>
</tr>
</tbody>
</table>

Corrigendum JIAFM-32-4, Page 350

Paragraph 8th on page 350 of Journal of Indian Academy of Forensic Medicine-32(4) Oct.-Dec. 2010 Issue, under heading “Indian Scenario” (Indian police---- demonstrations) is hereby deleted.

Corrigendum JIAFM-33-1, Page 33

The title of paper “Trends of Homicidal Deaths at a Tertiary Care Centre at Bengaluru” on page 33 of Journal of Indian Academy of Forensic Medicine -33(1) Jan.-March (2011) Issue will be read as “A Profile of Abortion Cases in a Tertiary Care Hospital.” The same title has also been modified in the Index on Page 1. Author sequence: the name of the authors P.C. Srivastava, B.C. Shivakumar, Shikha Saxena, A.K. Kapoor may kindly be read in order as mentioned along with their designation as follows:

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