

# DIAGNOSIS OF ABDOMINAL TUBERCULOSIS IN SURGICAL PATIENTS

Ismail, Mumtaz Khan

*Department of Surgery,  
Pakistan Institute of Medical Sciences Islamabad and  
Post Graduate Medical Institute  
Lady Reading Hospital Peshawar*

## ABSTRACT

**Objective:** To find the Significance of various diagnostic procedures for abdominal tuberculosis.

**Material and Methods:** This study was conducted in the general Surgical department of Pakistan Institute of Medical Sciences Islamabad from January 1997 to December 1999.

The study included 50 consecutive cases of abdominal tuberculosis that underwent surgery for their disease. Various diagnostic tests including tissue histopathology was performed on each and every patient. Statistical evaluation was done manually and Sensitivity of each test was Calculated

**Results:** This study shows that ESR was raised in 86%, of patients Mantoux's test was positive in 66%, Mycodot test in 52%, X-ray Chest showed activets in 26%, X-ray Abdomen with multiple fluid levels in 92%, Abdominal ultrasound reported mass of gut origin in 94% and tissue histopathology reported casseating granulomas in 100% of cases.

**Conclusion:** No single investigation except tissue histopathology is 100% diagnostic of abdominal tuberculosis. Tissue histopathology seems to be more informative therefore it is suggested that during laprotomy tissue should be taken for histopathology in every case where TBs suspected

**Key words:** Abdominal T.B, Intestinal T.B, Sensitivity, tissue histopathology.

---

## INTRODUCTION

Tuberculosis is a disease prevalent all over the world, specially in the under

developed countries where poverty, overcrowding and lack of hygiene is responsible for spread of the disease.<sup>1</sup> The incidence of tuberculosis have increased tremendously in present decade.<sup>2</sup> The increasing incidence

in developed countries is mainly due to increasing incidence of HIV infection.<sup>3</sup> In developing countries factors like poor case finding and improper treatment regarding dosage and duration result in emergence of multi drug resistant tuberculosis.<sup>4</sup>

It is a chronic infectious disease caused by an acid fast *Bacillus mycobacterium tuberculosis* and commonly occurs as infection of the lung but can affect any organ in the body.<sup>5</sup> Abdominal tuberculosis commonly affects peritoneum intestine or lymph nodes.<sup>6</sup>

Despite high degree of suspicion abdominal tuberculosis can be difficult to diagnose, the symptoms are vague, signs are non specific and the disease mimic many other diseases like crohn's disease and carcinoma.<sup>6</sup>

The diagnose of abdominal tuberculosis is made by a number of investigations like ESR, Mantoux Test, Radiological Studies, antigen based serological tests and sonography etc. However tissue histopathology and culture are definitive diagnostic procedures.<sup>7</sup>

## MATERIAL AND METHODS

This is a descriptive study of 50 cases of abdominal tuberculosis managed surgically in the department of General Surgery at Pakistan Institute of Medical Sciences (PIMS) Islamabad in three years from January 1997 to December 1999 inclusive. The patients were aged 13 years and above. All these patients presented to Surgical Outdoor Clinic or Casualty Department of PIMS and were admitted to surgical wards.

After detailed history and clinical examination each patient underwent investigation including blood complete picture, blood sugar, blood urea serum creatinin, serum electrolytes and urine analysis for commencement of conservative management.

Each and every patient underwent investigation including ESR, Mantoux test, Mycodot test (serological test performed on serum) x-ray chest and abdomen and abdominal ultrasonography. Some patient had further investigations where indicated, including sputum for AFB, peritoneal aspirate and other fluids for biochemical and microscopic examination and contrast studies (Barium meal follow through and small bowel enema) to establish the diagnosis.

The patients that improved with conservative management and did not have a laparotomy were excluded from the study. Only those cases were included in the study that underwent laparotomy. Operative findings were recorded and tissue was obtained for histopathology and final diagnosis was established on the basis of histopathology in each and every patient.

The statistical evolution was done manually. The mode and median were calculated by inspecting the frequency distribution while mean, standard deviation and percentages of various tests was calculated with the standard formulas.

## RESULTS

Table-I shows age and sex distribution in patients with abdominal tuberculosis. There were 26 males (52 %) and 24 females

AGE AND SEX DISTRIBUTION (n = 50)

Age	Male	Female	Total
Below 20 years	7	6	13 (26%)
21-29 years	14	11	25 (50%)
30-39 years	-	3	3 (6%)
40-49 years	2	1	3 (6%)
50 years and above	3	3	6 (12%)
Total	26 (52%)	24 (48%)	50 (100%)

TABLE - I

**INVESTIGATIONS PERFORMED  
IN ALL PATIENTS (n = 50)**

Test	Positive cases	Percentage (sensitivity)
ESR (raised)	43	86%
Mantoux test	33	66%
Mycodot test	26	52%
X-Ray chest findings	13	26%
X-Ray abdomen findings	46	92%
Abdominal sonography	47	94%
Tissue histopathology	50	100%

TABLE - 2

**AGE/SEX DISTRIBUTION**

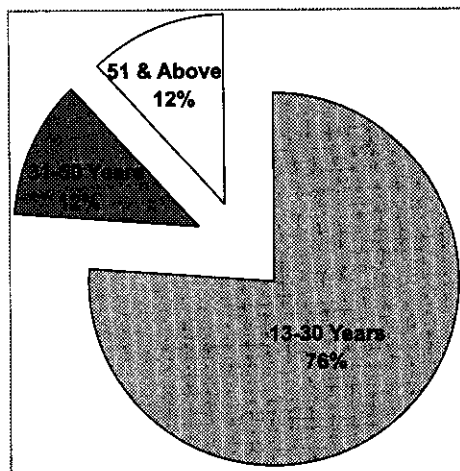


Fig. 1

(48 %) with male to female ratio 1.08:1. The age of patients ranged from 13-70 years with mode and median of 25 years, mean age of 29 years and standard deviation of  $\pm 14.8$  years.

Table 2 Shows investigation performed in all the patients while table No III shows investigations performed where they were indicated.

ESR was raised in 43 patients (86%)(The upper limit of normal ESR in first hour was taken as 15mm for males and 20mm for females.)

Mantoux test was positive in 33 patients (66 %), Mycodot 26 (52 %), x-ray chest in

**INVESTIGATIONS: COMPARISON WITH OTHER STUDIES**

Investigations	Study Quoted						
	Das et al <sup>16</sup> India	Harvath <sup>18</sup> USA	Taj et al <sup>13</sup> Peshawar	Underwood <sup>17</sup> UK	Naseer et al <sup>14</sup> Lahore	Manohar <sup>10</sup> 1996 S. Africa	Current Study 1999 Islamabad
ESR	92.9%	90%	60%	100%	66%	90%	86%
Mantoux test	-	-	38.8%	71%	60%	57.6%	66%
X-ray Chest	27.9%	-	12.5%	-	14%	40.8%	24%
X-ray Abdomen	48.3%	-	65%	20%	66.7%	-	92%
Abdominal ultrasound	-	-	91.6%	81.8%	-	-	94%
Sputum for AFB	-	-	6.6%	-	-	26.5%	14.3%
Ascitic fluid analysis	100%	-	85%	-	-	96.4%	100%
Barium studies	60.5%	66%	-	-	-	-	66.7%
Tissue histopathology	91.7%	-	100%	-	-	100%	100%

TABLE-3

13(26%), plain x-ray Abdominal 46 (92%), Abdominal Ultrasound in 47(94%) and tissue histopathology reported caseating granuloma in all patients.

## DISCUSSION

Abdominal tuberculosis is said to be disease of young adults.<sup>8</sup> Most studies indicate that it most commonly occurs below 30 years of age<sup>9,10,11,12</sup> and the same was observed in our study. Our male to female ratio was 1.08:1. This is supported by some of local studies.<sup>13,14</sup> However some studies shows the reverse pattern.<sup>15,16</sup> In our study ESR was raised in 43 patients (86%) ESR was raised in 92.9% as reported by Das and Shukla.<sup>16</sup> 90% by Manohar et al<sup>10</sup>, 100% by underwood et al<sup>17</sup>, 90% by Horvath et al<sup>18</sup>, 66% by Naseer baluch et al<sup>14</sup> and 60% by Taj et al.<sup>13</sup> Our results are in comparison with most of the above reports. However a normal ESR does not rule out tuberculosis.

Mantoux's was positive (more than 10mm) in 33 of our patients. It is reported to be 57.6% by Manohar et al<sup>10</sup>, 60% by Naseer Baluch et al<sup>14</sup>, 71% by underwood et al<sup>17</sup>, 70% by Sharman et al<sup>19</sup>, 86% by Bhergava et al<sup>20</sup> and 38.8% by Taj et al.<sup>13</sup> Our results in this respect on comparable to most of the above workers. However Mantoux test may not be diagnostic of tuberculosis as it may be negative in patients with active tuberculosis. And it may show false positive results in BCG vaccinated subjects.

A recently launched test at that time, the Mycodot test which detects anti mycobacterial antibodies in patients serum or blood though direct antigen antibody reaction was performed on all patients and was positive in 26 of them showing sensitivity of 52% which is considerably less than that quoted by the manufactures of Dynogen Inc USA<sup>21</sup> test to be 70.2%.

However a figure of 83% is reported by Bherdwaj Op et al<sup>22</sup> and Bergava DK et al<sup>23</sup>

using Soluble antigen fluorescent antibody (SAFA) test.

It is unlikely that Mycodot test will provide the diagnosis in all cases of abdominal tuberculosis. However it will support a clinical and radiological diagnosis in the absence of histologic or microscopic confirmation as concluded by various workers in cases of serological tests.<sup>22,23,24</sup>

Thirteen patients (26%) in our study showed positive findings for tuberculosis on x-ray chest. Abdominal tuberculosis was associated with pulmonary tuberculosis in 27.9% cases from Das and Shukla,<sup>16</sup> 35% by Bhargava et al<sup>23</sup>, 12.5% by Taj et al,<sup>13</sup> 14% by Naseer Baluch et al,<sup>14</sup> 46% by Fakher et al<sup>25</sup>, 65.4% by Welfred et al,<sup>7</sup> 40.8% by Manohar et al<sup>10</sup> and 90% by Homan et al.<sup>26</sup>

Our results in this regard are in comparison with most of the studies from subcontinent. However a higher number of positive chest x-rays are reported from Europe.<sup>7,26</sup>

Abdominal x-rays showed positive findings of dilated gut loops and air fluid levels in 46 cases (92%) which are reported to be 48.3% by Das and

Shukla, 33.3% by Welfred et al<sup>7</sup>, 20% underwood et al<sup>17</sup>, 66.7% by Naseer Baluch et al<sup>14</sup>, 34% by Fakher et al<sup>25</sup>, 65% by Taj et al<sup>13</sup>, 80% by Kapoor et al<sup>27</sup> and 100% by Jamil et al.<sup>15</sup>

Our findings in this regard are in comparison with those of Kapoor et al and Jamil et al. however these findings depend upon the predominant site of involvement and presentation of patient. Other findings on x-ray abdomen are ascites, calcified lymph nodes and enteroliths.<sup>18</sup> However all these findings are non specific and may occur in other diseases like malignancies and crohn's disease.

The abdominal ultrasonography showed positive findings of dilated gut loops,

enlarged mesenteric lymph nodes and localized or generalized ascites (usually present in various combinations) in 47 patients thus giving a sensitivity of 94%. These findings are reported to be 91.6% by Taj et al,<sup>13</sup> 81.8% by Underwood et al<sup>17</sup> and 96.3% by Johanneke.<sup>28</sup> Our sonologic findings are in comparison with the above workers.

Ziehl Nelson staining of sputum for acid fast bacilli was done in 14 cases and was positive only in 2 of them, sensitivity of 14.3%. It is reported to be 26.5% by Manohar et al,<sup>10</sup> and 66% by Taj et al.<sup>13</sup> However this finding is not of much help in the diagnosis of abdominal tuberculosis as not all the patients with abdominal tuberculosis have co existing pulmonary tuberculosis and only fraction of those may have open tuberculosis.

Thin straw coloured peritoneal fluid was present in 4 of our patients and in all (100%) it was exudate i.e. protein more than 2.5gm% and cells more than 250/mm<sup>3</sup> mostly lymphocytes. Exudative ascitis is reported to be 100% by Das and Shukla,<sup>16</sup> 96.4% by Manohar et al,<sup>10</sup> and 85% Taj et al.<sup>13</sup> Ascitic type tuberculosis mostly occurs with peritoneal involvement<sup>10</sup> and those patients are usually without complications (i.e. obstruction, perforation or bleeding) and admitted to medical wards. Exudative ascitis may be suggestive of tuberculous peritonitis in endemic areas and may provide sufficient ground for treatment.<sup>10</sup>

Most recently the levels of adenosine deaminase (ADA) enzyme in ascetic fluid were found to be raised by Bhergava et al<sup>29</sup> and Dwivedi et al<sup>30</sup> in cases of tuberculosis peritonitis.

Serum and ascetic fluid levels of this enzyme above 36u/l and 54u/l respectively and ascitic fluid/serum ADA ratio of more than 0.985 were considered suggestive of tuberculosis.<sup>29</sup>

Barium studies were positive in 4(66.7%) out of 6 patients for narrowing/dilatation of

small gut, deformed ileocaecal valve etc. suggestive of tuberculosis.

These findings are reported to be 60.5 by Das & Shukla,<sup>16</sup> 50% by Welfred et al<sup>7</sup> and 66% by Horvath et al.<sup>18</sup> Our findings in this regard are in comparison with the above workers; however these findings are non specific and may mimic those of crohn's disease and carcinoma.<sup>31</sup>

Histopathology was performed in all cases after laparotomy and all were positive for tuberculosis showing granulomas with Caseation necrosis, epithelioid cells granulomas and langhan's giant cells. Das and Shukla<sup>16</sup> reported this typical histology in 91.7%; Manohar et al<sup>10</sup>, Taj M et al,<sup>13</sup> Fakher and Muzafaruddin S<sup>32</sup> et al reported this finding to be 100% Ziehl Nelson staining and culture of the biopsy specimen is another way to confirm the diagnosis of tuberculosis but both of these are positive in only limited number of cases.<sup>33</sup> Moreover culture of mycobacterium tuberculosis is a lengthy process. (for comparison of investigations see Table No 3)

## CONCLUSION

No single investigation except tissue histopathology is 100% diagnostic of abdominal tuberculosis. However in situation where tissue histopathology can not be done a fairly good idea can be made to suspect abdominal tuberculosis by combination of various other investigative procedures.

## REFERENCES

1. Lingentelser T, Zek J, Marks IN, et al. Abdominal tuberculosis, still a potentially lethal disease. *Am J Gastroenterol* 1993; 85(5): 744-50.
2. Jareb A. Tuberculosis mortality in the United States find date in 1990. *Morbidity and mortality weekly report* 1991; 40(55-3): 23-27.

3. Narian JP, Ranvingliove MC, Kochin A. HIV associated tuberculosis in developed countries: Epidemiology and strategies for prevention. *Tubercle* 1992; 73: 311-21.
4. Khan MH. Tuberculosis, need to revitalize its control program in Pakistan. *J Coll Physicians Surg Pak* 1997; 6(1): 3.
5. Collins FM. Tuberculosis, the return of an old enemy. Critical review in *Microbiol* 1993; 19: 1-16.
6. Watters DAK. Surgery for tuberculosis before and after HIV infection. *Bri J Surg* 1997; 84: 8-14.
7. Welfred CG, PEH Khoo TK. The varied clinicoradiological presentation of abdominal tuberculosis. *Asian Med J* 1989; 32(2): 99-108.
8. Amber G. The appearance of abdominal tuberculosis. *Surg. Gynaecol Obstet* 1991; 172: 432.
9. Slicor, Tanjia VA. Epidemiology and clinical presentation of abdominal tuberculosis, a retrospective study. *J. Ind. Med Ass.* 1996; 94(a): 342.
10. Manohar A, Shujee AA, Pethengell E. Symptoms and inhusgative findings in 145 patients with tuberculosis peritonitis diagnosed by peritoneoscopy and biopsy over a fine year period. *J Surg* 1996; 11-12: 38-40.
11. Shukla HS, Hughhes LE. Abdominal tuberculosis in 70's a containing problem. *J Bri Surg* 1978; 65: 403.
12. Hulmik DH. Abdominal tuberculosis, CT evaluation. *Radiology* 1985; 157: 199.
13. Taj M, Mumtaz K, Naseem M, Omer AK. Experience with abdominal tuberculosis. *J Postgrad Med Inst* 1988; 12(1): 72-80.
14. Naseer B, Tufail M, Khalid D, Mahmood A. Abdominal tuberculosis, A varied presentation. *Pak J Surg* 1993; 9(1): 8-12.
15. Jamil A, Zafar IM. Abdominal tuberculosis, PIMS experience. *J Surg PIMS* 1996; 11(12): 328-40.
16. Das P, Shukla HS: Clinical diagnosis of abdominal tuberculosis. *J Bri Surg* 1976; 63: 941-6.
17. Underwood MJ, Thompson MM, Sayers AD, Hall AW. Presentation of abdominal tuberculosis to general surgeons. *Arch Int* 198; 140: 506-8.
18. Harwath KD, Whelen RL. Intestinal tuberculosis, the return of an old disease. *Am J Gastroenterol* 1998; 93(5): 692-6.
19. Sherman S, Rewedden JJ, Rani, et al. Tuberculosis enteratis and peritonitis, report of 36 36 genreal hospital cases. *Arch Int* 1980; 140: 506-8.
20. Bhargava DK, Kushwala AKS, Dasarthy S, et al. Endoscopic diagnosis of segmental colonic tuberculosis. *Gastroinest Endosc* 1992; 38: 571-4.
21. Dynogen Inc USA 99 Eric street, Cambridge MA 021139 USA. (product information) mycodat for the detection of antimycobacterial antibodies as an aid in diagnosis of active tuberculosis. 1-4.
22. Bhardwaj OP, Shrinves. Salouble antigen flourscant antibody test in the serodiagnosis of tuberculosis. Selection of the antigen proportion. *Ind J Med Res* 1982; 76: 5-9.
23. Bhargava DK, Shrinwas, Tarden BN, et al. Serodiagnosis of intestinal tuberculosis by sodouble antigen fluorescent antibody test (SAFA). *J Trop Med Hyg* 1986; 89: 61-5.
24. Bhargava DK, Daserthy S, Shrinwas, et al. Evaluation of enzyme linked immunosorbent assay using mycobacterial saline extracted antigen for the serodiagnosis of abdominal tuberculosis. *Am J Gastroenterol* 1992; 87: 105-8.
25. Fakhar H, Mahmood AM. Abdominal tuberculosis, profile of 50 cases. *J Coll Physician Surg Pak* 2000; 10(4): 125-7.
26. Homan WP, Grofe WR, Dineem P. A 44 years experience with tuberculosis enterocolitis. *World J Surg* 1977; 2: 245-50.

27. Kapoor VK, Chattopadhyay JK, Sharma LK. Radiology of abdominal tuberculosis. *Aus Radiol* 1988; 32: 365-7.
28. Joha naeke EA, Portalje Paur NM, Lohle Sjoerd D, et al. Ultrasound and abdominal tuberculosis. *Lancet* 1995; 346(5): 379-80.
29. Bhargava DK, Gupta M, Nijhaven. S, et al. Aderoswe deaminage (ADA) in peritoneal tuberculosis. *Diagnosistic volve in asatic fluid and serum. Tubercle* 1990; 71: 1-6.
30. Dwidedi M, Misra V, Kumar R. Valve of andrsive deaminage (ADA) estimation in diagnosis of tuberculosis asatis. *Am J Gastroenterol* 1990; 85: 1123-5.
31. Vander Pool DM, Larry O. Primary tuberculosis enteratis. *Surg Gynaec Obstet* 1988; 167.
32. Sadiq M. Intestinal tuberculosis, Surgical aspects: *J Postgead Med Inst* 1997; 11(1): 29-33.
33. Radica JM, Rajwanshi A, Kochnar S, et al. Abdominal tuberculosis diagnosed by fine needle aspiration cytology. *Acta Cytol* 1993; 37(5): 673-8.

---

**Address for Correspondence:**

Dr. Ismail,  
 Department of Surgery,  
 Lady Reading Hospital,  
 Peshawar.