(e) ISSN Online: 2321-9599

(p) ISSN Print: 2348-6805

ORIGINAL ARTICLE

DIAGNOSTIC VALUE OF FIBREOPTIC BRONCHOSCOPY IN SMEAR NEGATIVE PULMONARY TUBERCULOSIS

SK Bansal[1], GC Ahir[2], SPS Bagga[3], SK Gupta[4], Baltej Singh[5]

[1]Associate professor, [2]Professor and HOD, Deptt of Chest and TB , GGS Medical college and Hospital Faridkot- 151203 , Punjab, [3]Patiala heart centre, Patiala, [4]Ex- Professor & HOD , TB hospital, Patiala, Dhaliwal colony opp IT office , Patiala, [5] Lecturer, SPM Deptt, GGSMCH, Faridkot

ABSTRACT:

This retrospective study was carried out in the Department of Chest and Tuberculosis, Government medical College and Rajindra Hospital , Patiala.The aims and the objective of the study was to confirm the diagnosis in the smear negative cases of pulmonary tuberculosis so as to put them on anti-tubercular treatment by bacteriological confirmation. **Material and Methods-** In fifty clinicaly and radiologicaly suspected cases of pulmonary tuberculosis who were negative thrice on direct smear examination for acid fast bacilli and patients who did not expectorate at al, broncoscopy was done . Al the patients had no previous history of anti-tubercular drugs in the past or anti tubercular drugs , if taken duration was not more than 15 days. Detailed history and clinical examination of the patients was conducted with routine investigations. Prebronchoscopic sputum, post bronchoscope sputum and X-ray chest were got done, Bronchoscopic specimens such as bronchial aspirates, the lavage fluid, bronchial brushings and also post bronchoscope sputum was sent for direct smear examination (Ziehl Neelsen Method) for confirmation of the disease. **Results:** In this study, cough was the predominant complaint followed by fever and other constitutional symptoms suggestive of the disease as anorexia, fatigue,night sweats. Through bronchoscope,Mucosal ulceration was in 5 (10%))bronchial secretions in 10 (20%) , mucosal oedema and ulceration in & bronchial stenosis in 1 (2%) and mild haemoptysis in 4 (8)patients were visualised.10 (20%)specimens of bronchial aspirates or secretions were found to be positive for acid fast bacilli, 12 (24%) were positive by bronchial brushings, 1 (2%) on bronchial washing with an overal positivity was obtained in 23 (46%) patients 10 (20%)patients were confirmed for tubercle bacilli by post- bronchoscopic sputum examination. **Conclusion:** This study confirms that bronchoscopy was a valuable tool and is a undisputed diagnostic technique in the diagnosis of PTB in patients who are either negative on direct smear examination or did not expectorate at al, thus achieving more positive yield .

Key words: Fibreoptic bronchoscopy,,FOB pulmonary tuberculosis, sputum smear negative, AFB

Correspondence: Dr SK bansal. Associate professor, Deptt of Chest and TB , GGS Medical College and Hospital Faridkot-151203, Punjab

This article may be cited as: Bansal SK, Ahir GC, Bagga SPS, Gupta SK, Singh B. Diagnostic value of fibreoptic bronchoscopy in smear negative Pulmonary Tuberculosis. J Adv Med Dent Scie Res 2017;5(4):5-9.

Access this article online	
Quick Response Code	Website: www.jamdsr.com
	DOI: 10.21276/jamdsr.2017.5.4.2

INTRODUCTION

The sputum examination is the most specific, though not a sensitive method for the diagnosis of pulmonary tuberculosis . WHO expert committee in his VIII report recommended ." A case of tuberculosis is one who is bacteriologicaly confirmed ". Those cases in whom the disease had not been confirmed by bacteriological examination should be classified as Pulmonary TB Suspects or presumptive TB , A large number of patients may be negative on direct smear examination or some may not expectorate at al merely starting ATT on clinical suspicion may be a hasty decision and may lead to error in diagnosis and unwanted prolonged and inconvenient antitubercular therapy but on this apprehension if those clinically suspected cases of pulmonary TB are not put on ATT, 64% of them they would need chemotherapy at the end of six months[1] when their bacillary load increases or the symptoms worsen. Early detection of the disease and starting of early treatment are the cornerstone of successful strategy to control tuberculosis there by reducing the burden of tuberculosis .The patients in whom sputum is negative on Zeihl Neelsen staining method or patients who do not expectorate at al, the bronchoscopy has widened the scope for diagnosis of tuberculosis in those undiagnosed cases.

Gaustav Killain now caled , father of bronchoscopy" successfully removed the aspirated pork bone from the right bronchus of a 60 year old farmer he saw it was possible to slide a tube without danger into the bronchi. With the passage of time,the flexible fibre-optic bronchoscope gained superiority over the rigid bronchoscope and it has increased the scope of diagnosis especialy in Lung cancer.[2] FB is used for performing various diagnostic samples as bronchoalveolar lavage, endobronchial and transbronchial biopsies and therapeutic (extraction of foreign body, mucus plugs, blood clots, relieving central airway obstruction, deployment of metalic stents and others procedures. FB is an easy to perform and a safe procedure[3,4] and it has relatively less number of complications. Transbronchial lung biopsy with the help of FB is a useful alternative to the diagnosis of diffuse lung diseases and discrete peripheral lesions[5] endobronchial biopy and transbronchial lung biopsy It has been also used for the successful removal of the foreign bodies[6] and histopathogical diagnosis of the visible tumours[7] and thick secretions[8] The initial diagnostic approach to suspected cases of pulmonary tuberculosis is to demonstrate *Mycobacterium tuberculosis* in stained smears of expectorated sputum. In most of the tuberculosis centres, the bacteriological positive yield from sputum is around 16 to 50% and large proportion of patients remain negative in spite of clinical profile and radiological lesions being consistent with diagnosis of pulmonary tuberculosis[5]. Early diagnosis of pulmonary tuberculosis prevents progression of the disease and its morbidity . It also reduces the further transmission and infectiousness of the disease. Culture of sputum for acid fast bacilli (AFB) takes long time . In such a situation bronchoscopy has been tried for rapid diagnosis of tuberculosis in smear negative cases. Fibreoptic bronchoscopy with bronchial washings, brushings and bronchial secretions collected by bronchoscope is helpful in achieving the rapid diagnosis of PTB in smear negative cases.

MATERIALS AND METHODS

The retrospective study was carried out in the Department of Chest and TB , Government Medical College , Rajindra Hospital Patiala during the period from 1989 to 1991 In the patients who were sputum smear negative and also the patients who did not expectorate though they were clinicaly and radiologicaly suspected cases of PTB, bronchoscopy was done in those cases to obtain various specimens which were examined for AFB to confirm the diagnosis of tuberculosis. Prior to bronchoscopy, written consent of the patients or relatives was taken Detailed history was taken and clinical examination and investigations were got done. The procedure and its complications were explained. The pre medication with promethazine was given and local spray of 4% lignocaine was given for local anaesthesia. Through the bronchoscope, the samples of bronchial secretions, bronchoalveolar Lavage , bronchial brushings were taken. The patient was kept in the recovery room for the complications if any. The next day, the post bronchoscopic sputum sample was taken and sent for AFB examination, Repeat X-ray chest was got done to exclude any complications like pneumothorax or haemoptysis.

RESULTS

This study comprised of 50 suspected cases of Pulmonary tuberculosis in whom the pre- bronchoscopic sputum was negative Al the cases who underwent broncoscopy were reviewed and following observations were made. The bronchial aspirates, bronchoalveolar lavage (BAL) and specimens from bronchial brushings were collected and subjected to ZN staining. After a review of these patients, the following data were tabulated from this study.

Table1: Age distribution

Age in years	no of cases	Percentage
a) Below 20yrs	1	2%
b) Above 20 yrs		
- 20-30yrs	13	26
31-40yrs	16	32
c) Above 40yrs	20	40
Total	50	100

Table 2: Symptomatology

Symptoms	no of patients	%ge
Cough		
a)cough with expectoration	41	82%
b)cough without expectoration	7	14%
Fever	42	84%
Haemoptysis	14	28%
Pain Chest	3	6%
Weight Loss	5	10%
Loss Of Appetite	12	24%
Breathlessness	7	14%

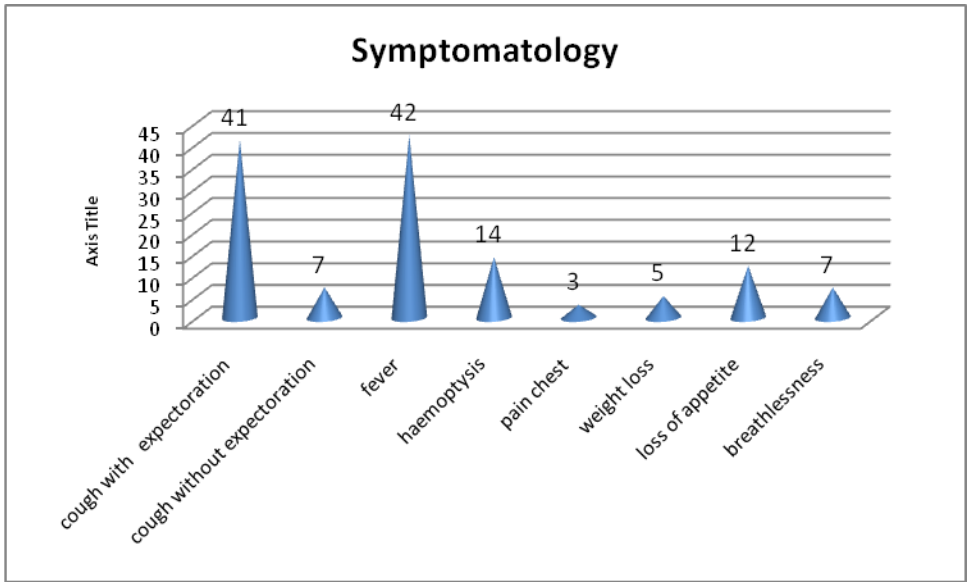

Table 3: Extent of radiological lesions and correlation of chest radiographs with demonstration of tubercle bacilli

Radiological appearances	New no of cases %percentage	percentage	No of positive cases FOB	%ge
Minimal lesions	40	80%	18 positive	36%
Moderate lesions Cavity if present <4cms in size	2	4%	Nil	Nil
Extensive lesions	8	16	3 positive	6%
Total	50	100	21	42%

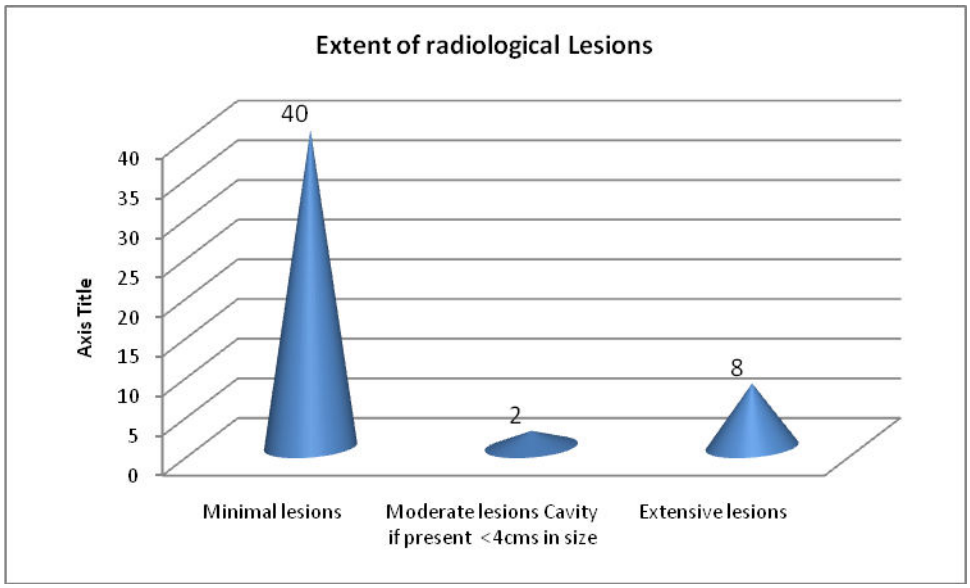

Table 4: Route of bronchoscopy

Route of bronchoscopy	No of patients	Percentage ge%
Transnasal route	42	84%
Transoral route	8	16%
Total	50	100

Table 5: Bronchoscopic appearances

Bronchoscopic appearances	No of pts	%ge
Mucosal congestion	5	10
Pus or secretions	17	34
Mucosal ulcerations	10	20
Mucosal oedema	6	12
Bronchial stenosis	1	2
Haemorrhage/ streak of haemoptysis	4	8
Normal	Nil	Nil
Total	43	86%

No significant complications was encountered during and after procedure except mild haemoptysis

Table 6: Bronchoscopic specimens and demonstration of bacilli

Bronchial aspirates or secretions	10	20
Bronchial brushings	12	24
Bronchial washings /BAL	1	2
Total no of positive pts	23	46%
Post bronchoscopic sputum	10	20%

DISCUSSION

Sputum smear negative (SSN) cases are difficult to be diagnosed and often confused on radiology because of lack of bacteriological confirmation and these undiagnosed cases are a causative factor for the transmission of the disease because of delay in diagnosis of PTB and initiation of treatment. Therefore these SSN patients necessitate more diagnostic techniques such as evaluation by FOB for bacteriological confirmation of Mycobacterium tuberculosis.

The retrospective study carried out on 50 patients in the Department of Chest and TB in Government Medical College and Rajindra Hospital, Patiala demonstrated that the bronchoscopy is a rapid and safe, though an invasive procedure for establishing the diagnosis of smear negative PTB from bronchoscopic specimens.

In this study, the disease was more in persons above 40 years of age with regard to rising prevalence with age (ICMR1958) as collaborated in the National Sample Survey. .The sex preponderance of male (n 27, 54%) and female (N23 46%) was almost equal in this study implying that sex factor was not significant, while it was more in females than males in studies by Jain et al , Vishwanathan et al and Ram Chandra et al.[9-11] Cough was the most prominent symptom present in 48 (96%) of the cases which was most common presenting symptom as also observed By Vishwanathan.[10]

In this study of 50 patients, 23 patients were found to be smear positive and ATT therefore ATT could be prescribed with confidence .Bronchial brush smears achieved yield of 12(24%) positive samples for AFB. Walace et al.(1991). Sarkar et al and Chawla et al (1988) established it as a useful ancillary procedure in the diagnosis of the disease[12. 13]. Funashahi 1983 favoured that brushings performed through the bronchoscope could provide excellent material for the diagnosis of the disease[14] as also suggested by our findings.

Bronchial washings or lavage fluid contributed little as only one (2%) suspected case was diagnosed as positive as was also observed by Walace et al[15]. 41 patients with miliary tuberculosis who had negative sputum smears and who underwent bronchoscopy, bronchial brushing, and transbronchial biopsy, a definitive diagnosis was obtained from bronchoscopy in 34 patients (83%) by Willcox et al.[16]

In this study, in 10 (20%) out of 50 patients, the post-bronchoscopic sputum sample showed the presence of acid fast bacilli . Overal post-bronchosopic sputum yield of 20% provided an additional support in the diagnosis of suspected cases of PTB by induction of post bronchoscopic sputum caused by dislodging the secretions .These results were quite comparable to those by SO et al, Purohit

(1983) , who showed positive results in 25% of cases[17-18].. 3 out of 7 patients who had unproductive dry cough demonstrated positive smears from post brochoscopic sputum specimens .

In our study, overal yield for AFB by bronchoscope brushings was obtained in 23 (46 %) which contributed to the immediate diagnosis the disease in PTB suspects while Quaiser et al in his study of 40 patients, diagnosis was confirmed in 24 (60%) patients[19]. Of these 24 patients, 17 patients were confirmed for PTB and 7 patients had another diagnosis and tuberculosis was established in 72/104 (69.22%) for tuberculosis in series of Das Gupta et al[20].

CONCLUSION

Thus the current study authenticates the diagnostic utility and safety of the fibreoptic bronchoscope in sputum smear negative pulmonary tuberculosis. The diagnosis of tuberculosis was established in 23 cases (46%) highlighting its role in diagnosis of pulmonary tuberculosis. Post bronchoscopic sputum examination further adds to the diagnostic pool so as to further increase the diagnosis of PTB and more PTB patients are put on ATT to reduce the burden and spread of the disease.

LIMITATIONS

The study was conducted to obtain an early diagnosis of PTB by direct smear microscopy and culture for AFB was not employed and there was lack of histopathogical studies of the bronchoscopic lesions because it was a time consuming process.

REFERENCES

1. Hong kong chest services ; Sputum smear negative pulmonary tuberculosis: controlled trial of 3 months and 2 month regimens of chemotherapy. First Report
2. Ikeda S: Flexible Bronchofiberscope,Annl OtolRhinol Laryngeol, 1970;79:916-923
3. Ahmad M, Livingston DR, Golish JA, Mehta AC, Wiedemann HP. The safety of outpatient transbronchial biopsy. Chest. 1986;90:403–5.
4. Alamoudi OS, Attar SM, Ghabrah TM, Kassimi MA. Bronchoscopy, indications, safety and complications. Saudi Med J. 2000;21:1043–7.
5. Michell DM , CollinsJV, Emerson C;Experience with fibreoptic bronchoscopy: review of 1200 case :Recent Advanes in Resp medicine; Vol 2, 94
6. Cunnanan CS: The flexible fiberoptic bronchoscope in foreign body removal:Experience in 300 cases: Chest, 1978;73(suppl):725
7. Webb J, ClarkeSW: Comparison between the positive biopsy ratesin lung Cancerachieved with the rigid bronchoscope and with fiberoptic bronchoscope, thorax, 1978;33:531
8. Barret CR, VecchioneJ, Bell AR; flexible fiberoptic bronchoscopy for Airways management during acute respiratory failure.Am Rev Resp Dis, 1974;109:429
9. Jain SK,Sharma Jn,Menon A et al: low lung field tuberculosis: An evaluaton of bronchoscopy in the bacteriological diagnosis.Indian J.of Chest Ds and alied Sciences
10. Vishwanathan R: tuberculosis of the lower Lobe.BMJ,19ii:1300-1302
11. Ramchandra, Nath J, Agarwal GN et al: Lower lung Field Tuberculosis; Indian Jour Tubeculosis,1982;29:168-172
12. Sarkar SK, Sharma GS, Gupta PR, Sharma RK. Fiberoptic bronchoscopy in the diagnosis of pulmonary tuberculosis. Tubercle. 1980;61(2):97-
13. Chawla R, Pant K, Jaggi OP, Chandrashekhar S, Thukral SS. Fibreoptic bronchoscopy in smear-negative pulmonary tuberculosis. Eur Respir J. 1988;1(9):804-6.
14. Funashashi A,Lohaus GH,Politis J, and Hrannicka: Role of Fiberoptic bronchoscopy in the diagnosis of Mycobacterial diseases. Thorax , 1983;38:267-280
15. Walace JM, Deuttsch AL,Harell JH MoserKM :Bronchoscopy and transbronchial biopsy in evaluation of patients with suspected active tuberculosis ;Amer Jour Medicine;1981:70-1189-1194
16. Willcox PA, Potgieter PD, Bateman ED, Benatar SR. Rapid diagnosis of sputum negative miliary tuberculosis using the flexible fibreoptic bronchoscope. Thorax. 1986 Sep;41(9):681-4.
17. So Sy, Lam Wk, Yu Dye. Rapid diagnosis of suspected pulmonary tuberculosis by fiberoptic bronchoscopy. Tubercle. 1982;63:195–200.
18. Purohit SD,Sisodia RS, Gupta Fiber-optic bronchoscopy in diagnosis of smear negative Pulmonary tuberculosis:.Lung India,1983;1 , 143-146
19. Quaiser S, Agarwal A, khan R, SF Haque. Fibreoptic Bronchoscopy as a valuable diagnostic option in sputum negative pulmonary tuberculosis 2012;(2):123-127. 2.
20. Das Gupta ,Mundala KS, Soni Namrata; Diagnostic role of fiberoptic bronchoscopy in pulmonary tuberculodsis; Indian J Otolarygol Head Neck surgery2000, Oct 52(4)347-349

Source of support: Nil **Conflict of interest:** None declared