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Chest X Ray findings in New Sputum Positive Pulmonary Tuberculosis

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Abstract :
Background: *Tuberculosis remains a worldwide public health problem. The guidelines of RNTCP suggest sputum as the initial diagnostic test for Tuberculosis. If sputum test is positive in patients who are receiving Anti tubercular therapy (ATT), without undergoing chest X-Ray. The sequel of tuberculosis of Lung can have a chronic affect on patients.*
Aim: *The aim of this study was to determine whether new sputum positive pulmonary tuberculosis (PTB) patients must undergo chest X-Ray as a part of the initial diagnosis and treatment of PTB.*
Materials and Methods: *100 patients who attended our OPD with cough and sputum for two weeks with and without HIV infection underwent sputum AFB. The diagnosis of PTB was made on the basis of clinical history, physical examination, Ziehl-Neelsen microscopy (AFB stain) on two sputum samples. Chest X-Ray was done for the sputum positive patients. The findings were recorded for each radiograph.*
Results*: Among the 70 sputum positive patients, 55 (78.57%) were male, 15 (21.42%) were female. Out of 70 patients with Tuberculosis 67 have Chest radiograph appearances in this group the cavitation, miliary pattern, t statistical trend towards less pleural effusion as well as hilar lymphadenopathy.*
Conclusion: *Our observations suggest that normal finding in CXR is an exception and implementing chest x-ray as an additional test in new sputum positive patients will be helpful in extent of damage of lungs and the future complications that results if patient is not compliant ATT in the Indian setting*

Keywords: [*Anti-tubercular therapy, Chest (X-ray), lymphadenopathy, pleural effusion, Pulmonary Tuberculosis,]*

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I. Introduction

Tuberculosis remains a major global health problem. Tuberculosis remains a worldwide public health problem despite the fact that the causative organism was discovered more than 100 years ago and highly effective drugs and vaccine are available making tuberculosis a preventable and curable disease. The South East Asia Region accounts for 39 per cent of the global burden of TB in terms of incidence and India alone accounts for 24 per cent of the world's TB cases. In most developing countries diagnosis of pulmonary tuberculosis depends on the clinical symptoms, chest radiography, tuberculin skin test and sputum smear examination for acid-fast bacilli (AFB). **[1]** Among diagnostic tools usually used for diagnosis of pulmonary tuberculosis, the chest x-ray plays an essential role, chiefly since it is widely available within the public health system, even in poor population. **[2]** Chest X rays are useful for the diagnosis of smear negative pulmonary TB and TB in children. It is not routinely indicated in smear-positive cases. **[3]** X-rays are valuable tools for the diagnosis of pleural and pericardial effusion, especially in early stages of the disease when clinical signs are minimal. It is essential in the diagnosis of miliary TB. **[4]**

II. Materials & Methods

The study was carried out at OPD. The sputum positive patients with and without HIV infection was referred to radiology department of RIMS hospital. The study was conducted from March 2016 to January 2017. The diagnosis of PTB was made on the basis of clinical history; physical examination besides all the patients had two sputum smear exams for acid fast bacilli using the Ziehl-Neelsen technique, the patients with TB infection were included in this study according positive sputum smear exam, positive history .The chest radiographs were analyzed by an expert radiologist. The radiographic features were summarized in categories.

The following radiological features were found: the number and zones involved with consolidation, cavitation, pleural effusion, broncho pulmonary pattern of spread: miliary disease: hilar and mediastinal lymphadenopathy.

Statistical Analysis

The statistical analysis was performed using SPSS 17 (SPSS Inc., Chicago, IL, USA). Values were tested for normality besides t-test, chi square was used and P-value of 0.05 or less was considered significant as well.

III. Results

Among the 70 sputum positive patients, 55 (78.57%) were male, 15 (21.42%) were female.

Table 1: Patient Distribution Based On Gender

Gender	Male	Female
	55 (78.57%)	15 (21.42%)

Out of 70 patients with Tuberculosis 67 have Chest radiograph appearances in this group the cavitation, miliary pattern, t statistical trend towards less pleural effusion as well as hilar lymphadenopathy.

Table 2: Radiological findings of 67 pulmonary tuberculosis patients

S. No.	Name	Age	Sex	Radiological findings
1	Erraiah	55	Male	Right Lower zone consolidation
2	Bala sundaram	54	Male	Upper zone consolidation
3	Thirupathaiah	60	Male	Upper ,mid & Para cardiac consolidation
4	Muniswamy	50	Male	Few calcific opacities in upper zone
5	Nageshwar Naidu	40	Male	Few calcific opacities in upper zone
6	Saraswathi	16	Female	Mid zone & parahilar consolidation bullae formation in upper zone
7	Neelanaik	62	Male	mid &lower zone consolidation Few calcific opacities in upper zone
8	Laxmi devi	50	Female	lower lobe patchy consolidation right hilar lymphadenopathy
9	Dasthagiri	44	Male	upper zone fibrotic opacities
10	Peddapeddaiah	46	Male	parahilar patchy consolidation ,Apical zone fibrosis
11	Chowdeshwari	25	Female	midzone consolidation, upper zone fibrotic collapse
12	Mallaiah	75	Male	Upper zone fibrosis with apical pleural thickening & partial atelectasis of right upper lobe
13	sundaram	65	Male	left Upper &mid zones Patchy consolidation
14	Mounika	20	Female	Left midzone consolidation Left upper lobe partial atelectasis
15	Kamal basha	60	Male	Left lung fibrotic collapse Patchy consolidation in LL
`16	Basha	69	Male	Left midzone consolidation left upper lobe partial fibrosis
17	Venkata Ramana	50	Male	Left upper zone fibro calcific opacities
18	Subbaiah	73	Male	left midzone consolidation B/L apical pleural thickening
19	Matthaiah	40	Male	Left parahilar patchy consolidation
20	Alla bakash	38	Male	Left midzone patchy consolidation Left upper zone fibro calcific opacities
21	Krishnam raju	35	Male	Left midzone consolidation
22	Subbaiah	50	Male	Left minimal pleural effusion
23	Rama devi	32	Female	Lingular fibrotic collapse
24	Gangadhar	20	Male	left midzone consolidation
25	Subbarayudu	65	Male	All three zones consolidation
26	Rajanna	60	Male	Left upper and midzone patchy consolidation and bilateral mild pleural effusion
27	Sidda Reddy	65	Male	Left lower lobe consolidation with pleural effusion
28	Seshaiah	29	Male	Right lower zone consolidation ,left lower zone consolidation, left pneumothorax
29	Ramaiah	74	Male	Right lower zone fibrosis, right pleural effusion
30	Gangadhar	24	Male	Right upper zone fibrosis
31	Gangulaiah	65	Male	Left hilar lymphadenopathy
32	Narayana	60	Male	Right mid zone patchy consolidation

33	Shankar	25	Male	Right mild pleural effusion
34	Branmaiah	45	Male	Left midzone consolidation ,mild pleural effusion
35	subbarayudu	53	Male	Left upper and mid zone fibrosis
36	Dullaiah	75	Male	Left lower zone consolidation
37	China swamy	60	Male	Bilateral consolidation
38	Parameshwaraiah	45	Male	Male left mid zone consolidation
39	Subbarayudu	65	Male	Left upper zone consolidation
40	Krishna	47	Male	Bilateral mid zone consolidation
41	Obulreddy	60	Male	Left lower zone consolidation
42	Dasthagiri	29	Male	Left mid zone fibrotic collapse
43	Dabarvalli	35	Male	Left mid zone patchy consolidation
44	Pullamma	36	female	Right mid and lower zone collapse ,left mid zone consolidation , right pleural effusion
45	Oahamathulla	45	Female	Left synpneumonic pleural effusion
46	Subbamma	50	Female	Left lobe fibrotic collapse
47	Basha	55	Male	Left lower zone consolidation
48	Gangaiah	80	Male	Right mid zone fibrotic collapse
49	Venkatamma	40	Female	Right upper zone consolidation
50	Penchaliah	45	Male	Left lower zone consolidation
51	Venkata Subbaiah	34	Male	Left mid zone cavity
52	Venkatamma	65	Male	Left hilar lymphadenopathy
53	Subbareddy	70	Male	Right mid zone consolidation
54	Bramanaiah	45	Male	Right lung collapse with pneumothorax
55	Magbul basha	60	Male	Right upper zone fibrosis
56	Nagamma	59	Female	Right mid and lower zone fibrotic collapse
57	Hussainbee	60	Male	Right upper zone consolidation, right pleural effusion
58	vekatasubbamma	50	Female	Fibrotic batch in left middle zone
59	Rama krishnumma	30	Female	Homogenous patch (consolidation)in right lower zone
60	Lakshmi devi	35	female	Cavity in right upper zone
61	Kamal bee	35	male	Left mid zone consolidation
62	Shantha kumari	21	female	Right mid zone cavity
63	Venkata subbamma	40	female	Left mid zone and lower zone consolidation with calcification in upper zone
64	Gangadhar	24	male	Right upper and mid zone fibrosis ,right pleural effusion
65	Vijay	55	male	Right mid zone fibrosis ,right pleural effusion
66	Subbarayudu	68	Male	Right upper and mid zone fibrosis
67	Subbarayudu	60	Male	bilateral patchy opacities

Despite great advantages in prevention and treatment, pulmonary tuberculosis is still an important health problem in India. Diagnosis of PTB is based on chronic symptoms and chest X-ray changes and sputum smear and culture but definitive diagnosis can be difficult as clinical and radiological findings may be non-specific, but in resource limited countries, most of pulmonary tuberculosis diagnosis is based on clinical features and chest X- ray .chest x ray is done along with sputum examination and is more helpful to know the extent of lung affected.

Table 3: Radiological Findings in New Sputum Positive Patients in Our Study

X ray finding	No. of patients	Percent %
Consolidation	29	43.28
Fibrosis	10	14.92
Pleural effusion	10	14.92
Calcification	8	11.94
Patchy infiltrations	5	7.46
Hilar adenopathy	3	4.47
Bronchiectasis	1	1.49
Cavity	1	1.49

The study shows that atypical radiological appearance of PTB, but some radiographic findings like pleural effusion were less common in our positive patients. Tuberculosis classically involves the upper lobe usually unilaterally. Bilateral lung involvement was observed among10 patients (14.92%).

IV. Discussion

Radiological patterns depend on the level of immunity in the host. Tuberculosis, Diagnosis of PTB is based on chronic symptoms and chest X-ray changes and sputum smear and culture but definitive diagnosis can

be difficult as clinical and radiological findings may be non-specific patients but in resource limited countries, most of pulmonary tuberculosis diagnosis is based on clinical features and chest X- ray. **[5]** Lower lobe, middle lobe, interstitial, and miliary infiltrates are common and cavitation is less common. **[6]**The study shows that atypical radiological appearance of PTB, but some radiographic findings like pleural effusion were less common in our positive patients compared with other studies. It should be considered so it may be the reason of low rate pleural effusion among our patients in comparison to other studies. The most characteristic sign of PTB in chest X-ray in patients without HIV is cavitations that were very rare in our patients. This is the reflection of poor cell mediated immunity. **[1]** Tuberculosis classically involves the upper lobes usually unilaterally. Bilateral lung involvement was observed among 27.7%bilateral consolidation, 1% miliary pattern, in TB /monary bilateral consolidation, 4.7% miliary pattern of the chest radiographs in HIV negative tuberculosis patients, suggesting that diffuse involvement is more common in patients with HIV and TB co infection as in study by Mahesha Padyana. **[7]**

They reported lymphadenopathy pattern in HIV positive patients with PTB in East and Africa which was dramatically high in rate pleural effusion **[8,9]** and miliary pattern 6-8%**[8,9,10]**as compared with 10.6%,13% and17% respectively in this study. Our findings are somehow resembled to other studies in other countries. The most significant differences between our results with other studies were racial variation in host response to M. tuberculosis which has a genotypic basis. **[11-14].**

V. Conclusion

This study indicated atypical radiological features in PTB. In our study, most common radiological presentation of tuberculosis was pulmonary consolidation followed by Involvement of lung field in tuberculosis was atypical as evidenced by bilateral lung involvement; middle and lower zone or diffuse involvement. In our country tuberculosis must be kept in our mind routinely with any chest X ray as seen in our research. The growing number of chronic patients of PTB. The guidelines of RNTCP suggest sputum as the initial diagnostic test. Now in every case sputum is the initial diagnostic test, if sputum is positive patients are receiving ATT, without undergoing chest X-Ray. Chest X-Ray must be included in the initial diagnostic test. The sequel of tuberculosis Lung can have a chronic affect on patients. Any patient with smear positive PTB must undergo Chest X ray and counseling should be given regarding the future pulmonary complications of tuberculosis.

References

[1]. Jamal LF, Moherdaui F. Tuberculosis and HIV infection in Brazil: magnitude of the problem and strategies for control. Scielo Analytics, Rev Saude Publica. 2007; 41(1): 104-110.

[2]. Badie BM, Mostaan M, Izadi M et al. Comparing Radiological Features of Pulmonary Tuberculosis with and without HIV Infection. J AIDS Clinic Res. 2012; 3:188.

[3]. Guidance for national tuberculosis programme on the management of tuberculosis in children, Second Edition, Geneva: World Health Organization; 2014; 3, Diagnosis of TB in Children.

[4]. Vinaya S, Karkhanis et al, Pleural effusion; diagnosis treatment and management. Open Access Emergency Medicine, 2012; 4: 31-52

[5]. Guidelines for Prevention and Treatment of Opportunistic Infections in HIV-Infected Adults and Adolescents Morbidity and Mortality. Weekly Report 58: RR-4

[6]. (2011) Tuberculosis National Institute for Health and Clinical Excellence.

[7]. Padyana M, Bhat RV, Dinesha M, Nawaz A. HIV-Tuberculosis: A Study of Chest X-Ray Patterns in Relation to CD4 Count. N Am J Med Sci. 2012 4: 221-225.

[8]. Noronha D, Pallangyo KJ, Ndosi BN et al. Radiological features of pulmonary tuberculosis in patients infected with human immunodeficiency virus. East Aft Med J. 1991; 68: 210-215.

[9]. Saks AM, Posner R Tuberculosis in HIV positive patients in South Africa: a comparative radiological study with HIV negative patients. Clin Radiol. 1992; 46: 387-390

[10]. Post FA, Wood R, Pillay GP Pulmonary tuberculosis in HIV infection: radiologic appearance is related to CD+ T-lymphocyte count. Tuberc Lung Dis. 1995; 76: 518-521.

[11]. Ahmad Z, Shameem M. Manifestation of tuberculosis in HIV infected patients. JIACM 2005; 6: 302-305

[12]. Prasad R, Saini JK, Gupta R, Kannaujia RK, Sarin S, et al. A comparative study of Clinico-radiological spectrum of tuberculosis among HIV Seropositive and HIV seronegative patients. Indian J Chest Dis Allied Sci. 2004; 46: 99-103

[13]. Mabiala Babela JR, Makosso E, Senga P. Radiological Specify of pulmonary tuberculosis in Congolese children: effect of HIV infection. Med Trop.2006; 66: 255-259.

14. Awoyemi OB, Ige OM, Onadeko BO. Pattern of active pulmonary tuberculosis in human immunodeficiency virus seropositive adult patients in University College Hospital, Ibadan, Nigeria. Afr J Med Sci. 2002; 31: 25-31.

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