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Research Article

Lower Lung Field Tuberculosis: A Clinical Study from Tertiary Care Teaching Hospital of North Karnataka

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Abstract: Pulmonary tuberculosis in the adult may present with unusual X-ray patterns that may lead diagnosis in the direction other than tuberculosis. This one year prospective study was designed to identify its prevalence in different clinical conditions, its common clinical and radiological presentations, diagnosis and outcome of treatment. All the patients of pulmonary tuberculosis who had lesions below an arbitrary line across the hila in theirchest X-rays were included in this study as cases. Sputum for AFB, blood sugar, HIV testing and other relevant investigations were performed in each patient. The usefulness of bronchoscopy in bacteriologic diagnosis was noted. Out of a total of 813 cases of pulmonary tuberculosis patients, 25 cases had lower lung field tuberculosis. It was more common in females 14(56%) than in males 11(44%). Majority of patients 16(64%) were in the 16-40 years age group. Risk factors were diabetes in 11, HIV in 3, pregnancy and lung cancer 2 cases each. Unilateral disease was more common 19(76%) and the right side was more frequently affected 15(60%). Consolidation 16(64%), cavitation 5(20%) and nodular opacities 4(16%) were the mainradiological findings. In conclusion, diagnosis requires a high index of suspicion. Diabetes mellitus, HIV, pulmonary malignancy and pregnancy increase the risk of lower lung field tuberculosis. Fiberoptic flexible bronchoscopy helps in diagnosis in sputum negative cases. Clinical presentation is similar to that of classical upper lung fieldtuberculosis and short course chemotherapy is equally effective as in classical upper zonal disease.
Keywords: Lower lung field tuberculosis, Pulmonary tuberculosis, Pulmonary malignancy, Diabetes, HIV, Fiberoptic flexible Bronchoscopy

INTRODUCTION

Pulmonary tuberculosis is a major public health problem in the developing countries especially in India.8.7 million new cases of TB (13% co-infected with HIV) and 1.4 million people died from TB, including almost one million deaths among HIV-negative individuals and 430000 among people who were HIV-positive were estimated in the year 2011[1]. In India more than 40% is infected with TB and 1.9 million people develop TB disease every year. Though pulmonary tuberculosis commonly affects the upper lung fields, lower lung field tuberculosis is also not uncommon. This often causes great confusion in the diagnosis. HIV/AIDS epidemic has considerably increased the incidence of middle and lower lung field tuberculosis [2] which is frequently associated with negative sputum smear due to lower bacillary load [3]. India and China are experiencing the fastest increase in DM prevalence and have the highest burden of TB in the world [4]. Moreover, the signs and symptoms are also similar to other non-tuberculous lung diseases. Therefore, it will be difficult to establish diagnosis in such situations. Since early diagnosis and treatment plays an important role in the prevention of tuberculosis, therefore a proper understanding about its clinical, radiological, and bacteriological presentations, as also outcome of treatment is very essential.

MATERIAL AND METHODS

This study was conducted in tertiary care teaching hospital of North Karnataka from July 2012 to June 2013. A total of 813 patients were diagnosed as cases of pulmonary tuberculosis. Patients who had both pulmonary and extra pulmonary tuberculosis were considered as cases of pulmonary tuberculosis and included in this study. Diagnosis of pulmonary tuberculosis was made by detailed clinical history, examination, X-ray chest, and sputum for AFB examination by Zeihl-Neelson method and culture on LJ media. Those patients, whose sputum was negative for AFB by direct smear and by culture, were diagnosed as cases of sputum negative pulmonary tuberculosis. Definitive diagnosis is made by recovery of acid-fast bacilli in the sputum or bronchial brushings and/or positive culture of Mycobacterium tuberculosis or the presence of caseating granuloma and/or acid-fast bacilli

in tissue specimens such as transbronchial biopsy. Whenever the patient was sputum negative, fiberoptic bronchoscopy was done to make a definitive diagnosis.

In the chest radiograph an arbitrary horizontal line across the hila ina PA was taken as the dividing line between upper and lower lung fields [5, 6]. Lower lung fields included middle lobe and the lingula in addition to the lower lobes [7, 8]. A total of 25 patients had lower lung fieldtuberculosis. Patients with the following features of age less than 15 years, cases of either ipsilateral or contralateral involvement of both upper and lower lung fields, Pleural effusion and thickening, unless associated with parenchymal lesions in the area involved were not included in the study [9]. HbA1C level, fasting and postprandial blood sugar levels was used to diagnose diabetes. HIV testing was done according to NACO guidelines [10]. All patients were treated with short course chemotherapy according to WHO guidelines [4].

RESULTS

There were 813 cases with pulmonary tuberculosis during the study period of July 2012 to June 2013, of which 25 had lower lobe tuberculosis. The incidence was 3.1 % Table 1. It was more common in females 14(56%) than in males 11(44%). Youngest patient was 18 years old and oldest was 73 years. Highest incidence 16 (64%) was observed in 16-40 years age group patients.

Most common presenting clinical feature was cough, with or without expectoration, in all patients (100%) patients, followed by fever in 20 (80%) patients, chest pain (56%), hemoptysis (12%) and Weight loss in 8%.

Risk factors were diabetes in 11 patients, HIV in 3, pregnancy and lung cancer 2 cases each. Main radiological presentation was consolidation in 16(64%), cavity in 5(20%) patients followed by nonhomogeneous opacities in 16%. Cavitation was less common in HIV infected patients and nonhomogeneous were more common. In diabetic patients, consolidation was more common than in non-diabetic patients. Right lung was more frequently affected in 15 (60%) patients. Left lung was involved in 7(28%) patients and bilateral involvement was there in 3(12%) patients. Sputum was positive for AFB in 14(56%) patients. Fiberoptic flexible bronchoscopy was used to diagnose when there was strong suspicion of tuberculosis. Bronchoscopy washings were positive for AFB in 11(44%) cases.

DISCUSSION

Kidd in his paper first reported the case of Lower lung field tuberculosis [11] in 1886. There is variation in reported frequency of lower lobe TB. It varies from 0.63% [7] to 7% [12,22,23]. In our study we observed an incidence of 3.1%. The studies from TB sanatoria reported a lower percentage [6, 8] than general hospitals [14,15].

All studies, including our study, except a few, showed female predominance [7, 8, 16]. The probable explanation being that female's have costal type of respiration resulting in poor ventilation of and hence higher chances of tuberculosis [12, 17, 18]. In present study, majority of the patients 16(64%) were in the age group of 16-40 years. This was also found in other studies [6, 15, 16]. There was higher incidence in females than in males (1.27:1) similar to the study by Vidyasagar *et al*. [8]. In HIV persons, radiological presentation depends upon level of immunodeficiency where the lower immunodeficiency favors mid- and lower lung zone tuberculosis [3, 4] and cavitation is less common. In a study by Purohit *et al*. [19] had also reported mid and lower lung field tuberculosis in more than 50% cases. Diabetes mellitus was associated in 11 cases. Studies have shown [6, 16, 18] higher incidence of lower lung field tuberculosis in diabetics.

Most of the patients presented with predominant symptoms of cough 100% followed by fever, chest pain, hemoptysis and weight loss. This finding is in conformity with other Indian and abroad studies [8, 12, 17, 22, 23]. Weight loss was prominent in HIV patients. Right lung was more predominantly involved in 60% patients was also seen in other studies [6, 8, 12]. The assumption that right side is more common than left is due to anatomical factors. There is a higher incidence of right sided hilar lymphadenopathy which may rupture through any bronchus and can cause lower zone infection [18].

Sputum positive was seen in 14(56%) and flexible fiberoptic bronchoscopy in 11(44%) cases. Flexible fiberoptic bronchoscopy increases the recovery rate of acid-fastbacilli from 47% to 94% in those patients suspected of having active pulmonary tuberculosis. Microscopic examinations of bronchoscopic specimens were found positive for acid fast bacilli in 48% to 67%. Bronchial washes increases the diagnostic yield as seen in the study of Wongthim [20]. Around 50% to 75% of cases would have an immediate microscopic evidence of mycobacterial infection [21].

Table 1: Incidence of lower lung field tuberculosis

Authors	Total tuberculosis cases	Subjects with LLT	Incidence of LLT(%)
Berger *et al*. [22]	386	27	7
Hamilton *et al*. [23]	349	10	3
Parmar [8]	1455	50	3.4
Vishwanathan [12]	638	41	6.4
Present study	**813**	**25**	**3.1**

Table 2: Clinical features of patients with lower lobe tuberculosis

Authors	Cough	Fever	Chest pain	Hemoptysis	Weight loss
Berger *et al*. [22]	25 (1.3%)	22 (82%)	16 (59%)	12 (44%)	12 (44%)
Hamilton *et al*. [23]	10 (100%)	2 (20%)	8 (80%)	5 (50%)	
Viswanathan [12]	41 (100%).	6 (15%)	7 (17%)		
Present study	**25(100%)**	**20(80%)**	**14(56%)**	**3(12%)**	**2(8%)**

All the patients were treated according to WHO Guidelines [4]. Success was similar to that in classical upper lung field tuberculosis.

CONCLUSION

Lower lung field tuberculosis is not uncommon finding inn clinical practice. This entity is frequently seen in an HIV infected persons, diabetics, pregnancy, pulmonary malignancy and young women, having lower lung field lesions. Absence of upper-lobe involvement cannot rule out lower lung field tuberculosis as a possible diagnosis when the etiology of pulmonary infiltration is not readily apparent. Likewise, lack of symptoms, initial negative sputum smears and culture for acid-fast bacilli and/or a negative initial tuberculin skin test do not entirely rule out the possibility of tuberculosis. The flexible fiberoptic bronchoscope has been a useful instrument not only in obtaining secretions and tissue specimens for definite diagnosis, but also in assessing the severity of the endobronchial lesions and as a guide for early surgical intervention. Prognosis in lower lobe tuberculosis is similar to those cases of upper lobe involvement.

REFERENCES

1. World Health Organization. Global Tuberculosis Control.WHO report 2011 Geneva, Switzerland.Available:http://www.who.int/tb/publications/global_report/gtbr12_executive summary.
2. Greenberg SD, Frager D, Suster B et al. Active pulmonarytuberculosis in patients with AIDS: Spectrum ofradiographic findings (including a normal appearance).Radiology 1994;193:115-9.
3. Elliott AM, Luo N, Tembo G, Halwiindi B et al. The impact ofHIV on tuberculosis in Zambia.A cross-sectional study. BrMed J 1990;301:412-5.
4. WHO (2007) Global tuberculosis control: surveillance, planning, financing. WHO report 2007.WHO/HTM/TB/2007.376.Geneva:WHO. Available:http://www.who.int/tb/publications/ global_report/2007/en/index.html.
5. World Health Organization. Treatment of tuberculosis:Guidelines for National Programmes. WHO 1997.WHO/TB/97. 220.
6. Segarra F, Sherman DS, Rodriguez-Aguero J; lower lung fieldtuberculosis. Am Rev Respir Dis 1963; 87: 37-40.
7. Mathur KC, Tanwar KL, Razdan JN; Lower lung fieldtuberculosis.Ind J Chest Dis 1974; 16:31-41.
8. Parmar MS. Lower lung field tuberculosis. Am Rev Respir Dis1967; 95: 310-2.
9. Vidyasagar B, Venkatesh V, Ajith Kumar; A clinical study oflower lung field tuberculosis. Lung India 1996;3:125-7.
10. National AIDS Control Organization. Specialist's training andreference module, UP State AIDS control Society; Lucknow1999; 67-80.
11. Kidd P; Basic tuberculous phthisis. Lancet 1886; 2: 616.
12. Vishwanathan R; Tuberculosis of the lower lobe. Brit Med J1936;2:1300.
13. Satya S; Textbook of pulmonary and extra pulmonarytuberculosis. 3rd ed. New Delhi. Interprint publication1998;120.
14. Kahn MA, Kovnat DM, Bachus B et al. Clinical androentgenographic spectrum of pulmonary tuberculosis inthe adult. Am J Med 1977;62:31-8.
15. Chang SC, Pui-Yuen L, Perng RP; Lower lung fieldtuberculosis. Chest 1987;91:230-2.
16. Ramachandra, Jithendranath, Agarwal GN, Srivastava VK, Mukerji PK; Lower lung field tuberculosis. Ind J Tub 1982;29:158-72.
17. Tripathy S, Nanda CN; Lower lung field tuberculosis in adults.JAPI 1970;18:999-1001.
18. Pandya L, Al-Sharif N, Maraey MA. Lower lung fieldtuberculosis in Saudi Arabia. An Saud Med 1990;4:374-7.
19. Purohit SD, Gupta RC, Bhatara VK. Pulmonary tuberculosisand human immunodeficiency virus infection in Ajmer.Lung India 1996;3:113-20.
20. Wongthim S, Limthongkul S, Udompanich J, et al. Fiberoptic bronchoscopy in diagnosis of patients with suspected activepulmonary tuberculosis. J Med Assoc Thai 1989;72:154-59.
21. Willcox PA, Benatar SR, Potgieter PD; Use of the flexible fiberoptic bronchoscope in diagnosis of sputum -negative pulmonary tuberculosis. Thorax 1982;37:598-601.
22. Herbert W. Berger, Margarito G. Gramdo; Lower lung field tuberculosis. Chest 1974:65:522-6.
23. Hamilton CE, Fredd H; Lower lobe tuberculosis: A review. JAMA 1935;105:427-30.