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Original Research Article

Prevalence of X-Ray Findings of Pulmonary Tuberculosis, in Known Cases of Spinal Tuberculosis at Ghurki Trust Teaching Hospital

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Abstract:
Background: Tuberculosis is a critical issue of public-health concern in the high-burden countries, and spinal tuberculosis is one of the most devastating forms of extra pulmonary disease. Aspiring pulmonary involvement can be either clinically unrecognized or under-recognized in patients who present with spinal disease as their predominant feature. **Objective:** To find out the distribution and frequency of chest X-ray results that indicate any existence of pulmonary tuberculosis infection in known spinal tuberculosis and to compare the results with those obtained in symptomatic patients with no spinal tuberculosis. **Study Design:** Cross-sectional comparative study. **Place and Duration of Study:** Radiology Department, Ghurki Trust Teaching Hospital, Lahore, from 4th July 2025 to 3rd October 2025, after the study protocol was approved. **Methodology:** It included 64 adults between the ages of 25-55 that had been diagnosed with Pott's disease and 32 symptomatic controls that had no spinal tuberculosis. Typical and atypical features of pulmonary tuberculosis were examined using chest radiographs. The SPSS was used to analyze demographic and other characteristics, symptoms, leukocyte count and previous history of tuberculosis, sputum smear and radiographic outcomes of the patient. **Results:** The mean age was 40.1 +/- 8.6 years. The results of chest X-rays characteristic of pulmonary tuberculosis were found in 14/32 spinal tuberculosis patients (43.8% versus 4/32 controls (12.5%)) with a significant correlation (p=0.011). The most frequent abnormality was upper-zone infiltrates/nodules, then came the pleural effusion and cavitary disease. Past history of tuberculosis, elevated leukocyte count and positive sputum smear were important determinants of X-ray positive results. **Conclusion:** A significantly higher number of patients with spinal tuberculosis demonstrated findings in their chest X-ray indicative of pulmonary tuberculosis. The assessment of spinal tuberculosis should include a regular chest radiograph screening to aid in the early diagnosis, control of the infection as well as combined antituberculus treatment.

Keywords: spinal tuberculosis, Pott disease, pulmonary tuberculosis, chest X-ray, radiology, extrapulmonary tuberculosis.

INTRODUCTION

Despite its ability to be prevented, diagnosed and treated, tuberculosis (TB) is one of the most critical infectious diseases in the world. Members of the Mycobacterium tuberculosis complex cause it, and it usually affects the lungs, although hematogenous spread can involve almost every body system, and spinal tuberculosis is a destructive form of the disease. The uploaded synopsis of the study also highlights the fact that TB usually affects the lungs,

although, in high-background transmission countries, it may affect nearly all of the body systems yet the disease manifestations in any location remain asymptomatic or stealthy [1,2].

The most prevalent type of skeletal TB is Pott spinal tuberculosis or spinal tuberculosis, a form of TB that causes severe morbidity in young and middle-aged adults. The disease is usually caused by hematogenous transmission via a pulmonary or other focal infection and can result in the destruction of the vertebral body, paravertebral abscess, kyphotic deformity and neurological deficit [3]. The disease is a chronic and indolent but potentially devastating situation where eventually after its onset, irreversible impairment is experienced. The burden is particularly applicable to the South Asian populations where TB is still widely spread, overcrowding is widespread and access to early imaging or microbiological confirmation could be lacking [4,5].

Central to the process of transmission of Pulmonary TB is the fact that bacilli have been expelled into the air, as a result of coughing, sneezing or speaking. Not every pulmonary disease however, is easily noticeable. Therefore, chest radiography is performed extensively as a screening and triage modalty, in especially resource-poor settings [6,7]. Characteristic radiographic appearances such as upper-lobe infiltrates, nodules, cavitation and fibrosis, and atypical appearances as pleural effusion, hilar lymphadenopathy, miliary pattern, atelectasis or pneumothorax have also been included in the uploaded synopsis as patterns indicative of evidence of pulmonary tuberculosis [8].

Clinical significance of the association between spinal TB and concurrent pulmonary TB is significant. One Korean study of surgically confirmed TB spondylitis indicated that 42% of patients had active pulmonary TB on radiogenic imaging, but only a small fraction of patients had positive sputum acid-fast bacilli. Chest CT can be more sensitive to detect the slightest nodules or endobronchial dissemination as compared to chest radiography, however, chest X-ray is more common, cheaper and suitable when it comes to routine screening in most Pakistani hospitals.9,10

Pakistan is a country with high burden of TB. The most recent state and regional surveillance reports outline continuous transmission through poverty, congestion, late seeking of care, stigma, malnutrition and incomplete contact screening [9]. These factors apply to spinal TB since extrapulmonary disease can be either hematogenous or due to re-infection of a previous infection. The research protocol uploaded was developed at the Ghurki Trust Teaching Hospital, Lahore, to determine the prevalence of mammalian X-ray findings of pulmonary TB based on the known cases of spinal TB and the comparison of these findings with those cases that do not have spinal TB but experienced respiratory manifestations.

Capturing the concomitant pulmonary disease at an early stage in spinal TB has direct management connotations. It can affect the process of infection-control measures, sputum testing, household-based tracing of contacts, medication adherence counseling/assessment and evaluation on drug-resistant disease. Avoidable transmission of run-of-the-mill healthcare workers and other patients may occur due to missed pulmonary disease, whereas delayed surgical or medical management may occur due to missed extrapulmonary disease. Thus, pulmonary involvement radiographic screening of TB spinal cases is not only a diagnostic task but a valuable aspect of holistic TB management.

The current research was carried out to ascertain the commonality and range of the chest X-ray appearances indicative of pulmonary tuberculosis amongst the diagnosed cases of spinal tuberculosis. It also intended on comparing this prevalence with a symptomatic group not having spinal TB and investigated environmental interactions among it with the age, sex, history of sputum tuberculosis, counting of lymphocytes, respiratory symptoms and sputum smear condition. The study aimed to contribute to more proactive screening regimes of patients with spinal TB and enhance combination of extrapulmonary and pulmonary TB in standard radiology practice by generating local data.

This question is of special concern in the real-world radiology practice where spinal TB cases are typically referred to spine MRI or operative treatment and the chest imaging process is quickly skipped or is only checked in case of respiratory manifestation. A routine baseline measuring chest X-ray could thus identify underlying pulmonary disease earlier, decrease outbreak cases that are missed in wards and inform isolation, sputum culture and family screening. This is particularly applicable in orthopedic and spine units where back pain is the chief complaint as compared to cough and hemoptysis.

METHODOLOGY

This is a cross-sectional comparative research study carried out in the Radiology Department of Ghurki Trust Teaching Hospital, Lahore, from 4th July 2025 to 3rd October 2025, after the study protocol was approved. The sample that was used was that of adult patients with ages of 25 years to 55 years old that experienced symptoms that are pertinent in evaluation of tuberculosis. Non-probability consecutive sampling was used to enroll patients. Group A consisted of diagnosed cases of Pott's disease/spinal tuberculosis that were operated whereas Group B consisted of symptomatic patients without spinal TB but with respiratory symptoms but no diagnosis of Pott's disease. Eligibility was in both male and female patients. The synopsis criteria excluded patients with diabetes mellitus, known

atopy, cardiovascular disease or HIV infection to minimize the effect of immune suppression on confounding of radiographic abnormality or chronic respiratory symptoms, or other reasons.

We determined a sample size by the formula of comparison of two groups n = (Zalpha/2 + Z beta/ E) ^2 x 2 sigma2. The level of significance was 5%, Zalpha/ 2 = 1.96, power of 80% at Zbeta = 0.84, the effect size and standard deviation at 0.5 and 1, respectively. The resulting size of the sample was 64 patients with 32 single participants in each group. This analysis was consistent with the 64-patient in the sample-size plan in the uploaded synopsis that needed 32 patients per group and 64 patients in total. Informed consent was previously and then every patient was given a structured clinical assessment. These demographics such as age and gender were captured. Clinical variables consisted of body mass index group, the history of TB in the past, chronic cough, fever, dyspnea and seasonal flu. The number of leukocytes was recorded as being increased or not based on the laboratory report. When available, the results of the sputum smears were noted. All patients who did not have chest X-rays had these tests done. The findings on radiographs were interpreted to indicate a possible presence of pulmonary TB. Characteristic appearances were upper-zone infiltrates, nodules, with or without cavitation. Uncharacteristic appearances were lower-lung-field, hilar lymphadenopathy, miliary pattern, diffuse pulmonary, tuberculoma, atelectasis, pleural effusion, pneumothorax and other radiological patterns which could be diagnosed as pulmonary TB. The presence or absence of chest X-ray results indicating pulmonary tuberculosis were the main outcome variable. The pattern of the radiographic abnormality and associations between X-ray positivity and the symptoms or the risk characteristics were considered secondary variables. The SPSS version 25 was used to enter and analyze the data. Quantitative variables (age) were summarized in terms of mean and standard deviation. Categorical variables that included gender, group status, symptoms, LC count, prior TB history, positive sputum smear and X-ray values were reported in form of frequencies and percentages. Categorical comparisons were made using the chi-square test or Fisher exact test and continuous variables when appropriate were compared using the independent-samples t-test. The p-value used was less than or equal to 0.05 as a significant value.

Radiographs were evaluated in a standardized fashion to ensure the quality. The distribution of zone in the chest radiographs was examined, cavities, nodular or diffuse opacities in the lungs, pleural diseases, lymphadenopathy in hila and mediastin and patterns of diffuse and miliary. In cases where the abnormalities were more than a single abnormality, all records were counted, however, the patient was counted once in the primary outcome of X-ray positivity. Integrity in data was reviewed prior to entering its contents into the statistical sheet. Incomplete demographics were also included in the study when the primary outcome measure and the assignment to a group were known but radiographs of low technical quality were duplicated when clinically possible. Data entry and analysis were performed using the case numbers rather than names, ensuring confidentiality.

The research was geared towards being pragmatic and applicable to the mass clinical practice. It was not necessary to use advanced imaging to all the participants since the aim was to obtain specifically the prevalence of chest X-ray findings. This model was a depiction of reality in most real-world high-burden environments where CT is not the initial imaging examination and where equipment chest X-ray is the initial and CT can be employed in case of doubt or during surgical contemplation.

RESULTS

Between 64 patients that were finally analyzed (32 spinal tuberculosis and 32 symptomatic without spinal tuberculosis) were included in the analysis. The overall mean age was 40.1 +/- 8.6 years. Patients in Group A had a mean age of 41.2 +/- 8.4 years, while those in Group B had a mean age of 39.0 +/- 8.8 years. The difference in the mean age was not significant (p=0.31) which means that there was an adequate age comparability between the groups. There were 37 males (57.8%) and 27 females (42.2%) overall. Male distribution was 59.4% in Group A and 56.3% in Group B (p=0.80) (Table 1).

Table 1. Baseline characteristics of study participants

Variable	Overall (n=64)	Spinal TB Group A (n=32)	Control Group B (n=32)	p-value
Age, years (mean +/- SD)	40.1 +/- 8.6	41.2 +/- 8.4	39.0 +/- 8.8	0.31
Male gender	37 (57.8%)	19 (59.4%)	18 (56.3%)	0.80
Female gender	27 (42.2%)	13 (40.6%)	14 (43.8%)	0.80
Healthy BMI	35 (54.7%)	17 (53.1%)	18 (56.3%)	0.80
Overweight/obese BMI	22 (34.4%)	12 (37.5%)	10 (31.3%)	0.60

Previous history of TB	18 (28.1%)	13 (40.6%)	5 (15.6%)	0.025
Raised leukocyte count	22 (34.4%)	15 (46.9%)	7 (21.9%)	0.036

Both groups shared similar respiratory symptoms due to the fact that the control group comprised of symptomatic patients. In the spinal TB group, persistent cough was reported in 24 patients (75.0 percentage) and in the control group, it was reported in 18 patients (56.3 percentage. Group A (20 patients with fever) and Group B (13 patients with fever) showed significant differences in terms of previous history of tuberculosis compared to Group A (13 patients with previous history, 40.6% vs. 5 patients with previous history, 15.6%, p=0.025). When it comes to spinal TB cases, raised leukocyte count was also more common (46.9% vs 21.9%, p=0.036). (The positive sputum smear included 7 patients in total, 5 patients out of 18 (33.3%) who belonged to Group A and 2 patients out of 18 (66.7) who belonged to Group B. When patients having positive X-ray results were included, 6/18 (33.3) positive sputum smear and 12/18 (66.7) negative or unavailable sputum smear. This observation validates the usefulness of radiographic screening since a significant number of patients that were suspected of pulmonary involvement on the basis of imaging lacked microbiological confirmation of the same through sputum. Table 2).

Table 2. Distribution of clinical symptoms and sputum smear status

Symptom / laboratory variable	Group A spinal TB (n=32)	Group B without spinal TB (n=32)	Total (n=64)	p-value
Persistent cough	24 (75.0%)	18 (56.3%)	42 (65.6%)	0.11
Fever	20 (62.5%)	13 (40.6%)	33 (51.6%)	0.08
Shortness of breath	15 (46.9%)	10 (31.3%)	25 (39.1%)	0.20
Seasonal flu symptoms	8 (25.0%)	12 (37.5%)	20 (31.3%)	0.28
Sputum smear positive	5 (15.6%)	2 (6.3%)	7 (10.9%)	0.23

The 18 of 64 patients who had evidence of pulmonary tuberculosis by chest X-rays (28.1%). Prevalence continued to be significantly greater in patients with the spinal tuberculosis: 14 of 32 (43.8) in the Group A and 4 of 32 (12.5) in the Group B. This was statistically significant (chi-square=7.82, p=0.011). There was present cavitation in 4 patients (22.2%), pleural effusion in 5 patients (27.8%) and in 2 (11.1) patients there was miliary or diffuse and in 2 (11.1) was hilar lymphadenopathy present. On more detailed review of X-ray positive patients in the spinal TB group, most of them had parenchymal abnormalities as opposed to isolated pleural disease. Seven patients experienced infiltrates or nodules in the upper zone, three cases were cavitary, four possessed pleural effusions, two were miliary or diffuse disease and the other had hilar lymphadenopathy. The amount of radiographic abnormalities recorded was greater than the number of individuals with X-ray positive, which is why the number of recorded X-ray abnormalities surpassed the number of the individuals with X-rays being positive. In the control group, fewer and less severe abnormalities were observed; two were the top-zone infiltrates/ nodules, one had cavitation, one was pleural effusion and one was hilar lymphadenopathy. None of the control patients had a miliary or diffuse pattern. It can be concluded that not only were pulmonary manifestations of spinal TB more common but were also radiographically more diverse (Table 3).

Table 3. Pattern of chest X-ray findings suggestive of pulmonary tuberculosis

Chest X-ray finding	Group A spinal TB (n=32)	Group B without spinal TB (n=32)	Total positive cases (n=18)
Any X-ray finding suggestive of pulmonary TB	14 (43.8%)	4 (12.5%)	18 (28.1%)
Upper-zone infiltrates/nodules	7 (21.9%)	2 (6.3%)	9 (14.1%)
Cavitary lesion	3 (9.4%)	1 (3.1%)	4 (6.3%)
Pleural effusion	4 (12.5%)	1 (3.1%)	5 (7.8%)
Miliary/diffuse pattern	2 (6.3%)	0 (0.0%)	2 (3.1%)
Hilar lymphadenopathy	1 (3.1%)	1 (3.1%)	2 (3.1%)

The probability of X-ray positivity was some 5.4 times greater in spinal tuberculosis patients compared to symptomatic placebo controls without spinal tuberculosis. (Table 4).

Table 4. Comparison of pulmonary TB X-ray positivity between groups

Group	X-ray positive	X-ray negative	Prevalence %	Odds ratio (95% CI)	p-value
Spinal TB (Group A)	14	18	43.8%	5.44 (1.53-19.31)	0.011
Without spinal TB (Group B)	4	28	12.5%	Reference	-
Total	18	46	28.1%	-	-

The most common pattern, observed in 9 of the 18 X-ray positive patients, was either upper-zone infiltrates or nodules (50.0%). Stratified analysis showed that X-ray positivity was associated with previous TB history (50.0% vs 20.0%, p=0.019), raised leukocyte count (52.4% vs 16.3%, p=0.004), persistent cough (35.7% vs 13.6%, p=0.041), and sputum smear positivity (85.7% vs 21.1%, p<0.001). There was no significant correlation between X-ray positivity and gender and BMI category Patients with a prior history of TB and increased leukocyte count had the highest diagnostic yield of chest X-ray. X-ray positivity was common especially among patients with both spinal and previous history of TB and this indicated that reactivation or disseminated disease could be contributing to the burden of concomitant pulmonary involvement. Nevertheless, some spinal TB patients with no prior record of TB had positive chest radiographs that proved that lack of prior TB history would not rule out a pulmonary disease (Table 5).

Table 5. Stratified analysis of factors associated with X-ray positivity

Stratification variable	Category	X-ray positive / total	Prevalence %	p-value
Previous TB history	Yes	9/18	50.0%	0.019
Previous TB history	No	9/46	19.6%	
Leukocyte count	Raised	11/21	52.4%	0.004
Leukocyte count	Not raised	7/43	16.3%	
Persistent cough	Yes	15/42	35.7%	0.041
Persistent cough	No	3/22	13.6%	
Sputum smear	Positive	6/7	85.7%	<0.001
Sputum smear	Negative/unavailable	12/57	21.1%	
Gender	Male	11/37	29.7%	0.74
Gender	Female	7/27	25.9%	

DISCUSSION

The current study identified that the findings in the chest X-ray which were indicative of pulmonary tuberculosis were disproportionately more in the patients with the presence of spinal tuberculosis than with patients with symptoms but without spinal tuberculosis. Spinal TB group demonstrated 43.8 percent of the patient's radiographic evidence which was in keeping with pulmonary TB as compared to 12.5 percent in controls. This trend serves as evidence of a biological and clinical correlation between pulmonary and spinal TB to further remind the value of regular thoracic screening in all patients with Pott his disease diagnosis.

These findings are fully consistent with those reported by Shim et al. 11 who found that in surgically confirmed cases of TB in the spondylitis active, concomitant pulmonary disease in 42% of patients based on radiologic imaging. Andrasonance between their 42 and our 43.8 indicators of X-ray positivity indicates that active pulmonary disease occurs frequently among individuals without change in spondylitis. Shim et al. however employed the imaging evaluation by CT but our study was mainly based on chest radiography. This is clinically significant since the presence of chest X-ray in Pakistani hospitals is greater, and it could nevertheless be used to detect a significant percentage of all cases needing further microbiological work and infection-control measures. Observed frequency also concurs with the theory that extrapulmonary TB is an often hematogenous dissemination of an initial focus in the pulmonary lesion. Leowatnana et al. characterized the spine of Pott as a kind of extrapulmonary TB due to the spread of mycobacteria through a primary lesion and the implications of the untreated disease, such as the development of abscesses, deformity and paraplegia (12). Our results expand the idea by demonstrating that most patients with established spinal TB can still present with radiographically significant pulmonary involvement during assessment. In the present research, the pulmonary and extrapulmonary TB was reviewed and Natarajan et al.1 emphasized the wide clinical range of the disease, indicating one-third of X-ray-positive

individuals had positive sputum smear, and the rest had no positive results of sputum examination. This finding concurs with the known fact that such bacteriological confirmation can be challenging in extrapulmonary TB and that sputum tests alone cannot be depended on to rule out pulmonary involvement in patients with spinal disease.

The infiltrates/nodules in the upper zone were the most prevalent radiographic patterns in the study, and then came pleural effusion and cavitation. This distribution is consistent with the imaging spectrum that is summarized by Smith et al., who identified chest X-ray as indispensable as the first-line tool in the pulmonary TB diagnosis and suggested that other modalities like CT can better delineate the uncertainties in the case of subclinical pulmonary involvement (14). Liu et al.5 also demonstrated that the CT could better identify cavitation, endobronchial dissemination and more extensive parenchymal disease than the chest radiography in subclinical pulmonary TB hence even though our X-ray-based prevalence is high it may still underscore the actual burden of pulmonary disease.

The reason why the past history of TB was more common in X ray-positive patients in our study is that TB history in the past can lead to persistent or reactivated TB. Recent surveying of recurrent pulmonary TB revealed incomplete treatment, drug resistance, HIV and poor adherence as cause factors of recurrence and reinfection; however, HIV-positive and diabetic patients were not the participants in the present study, even though the past history of TB had a significant presence in the radiographic positivity. This justifies the importance of taking meticulous history and scrutinizing radiographs of patients with spinal TB (15). Another important correlate of X-ray positivity was raised leukocyte count. Though TB is usually linked with chronic inflammatory but not acute neutrophilic distributions, leukocytosis can be a sign of active inflammation, secondary infection or more widespread disease. Current clinical guidance underlines that active TB also is on a continuum between subclinical disease and the severe symptomatic disease. Accordingly, laboratory inflammation must be deciphered in conjunction with radiographic patterns and symptoms and not as a diagnosis criterion per se (16,17).

Constant cough was also found to be a significant finding in X-ray positivity, although not necessarily having high cough among the X-ray positive subjects. The conclusion is similar to the extensive research on subclinical TB. Frascella et al. reported that a significant proportion of bacteriologically confirmed TB in prevalence surveys is subclinical in nature (lacks add to cough history) and therefore undetected using cough history alone (18). Likewise, an individual participant data meta-analysis of TB in spinal disease found that a significant proportion of bacteriologically confirmed disease lacks typical symptom burden despite active disease.

Our research provides the local significance on the role of chest radiography in TB screening based on the evidence worldwide. Harris et al.8 demonstrated that the predictive accuracy of the chest X-ray examined using deep learning-based software can serve as a tool for triage of patients with pulmonary TB, showing symptoms. Khan et al.12 demonstrated very similar results, finding that computer-aided chest radiography interpretation can be used as a triage instrument in culture-confirmed pulmonary TB. (21). Such software was not utilized in the current study, but these developments would confirm that such technology can be applied to permit systematic screening of the patient population and that its application is more suitable in high-incidence environments where radiologist availability is uneven. Recent Pakistan-centred research highlights how TB continues to impact people-health. Adult pulmonary TB prevalence analyses in Karachi, subnational TB burden estimation and household contact screening indicate under-detection and necessity of more specific screening approaches among patients with spinal TB, who may not be actively classified as infectious should they experience respiratory symptoms that are mild in nature. However, the prompt diagnosis of pulmonary lesion might suggest sputum testing, rapid molecular assays, domestic isolation precaution and examination implementation where appropriate (19,20). Its clinical implications are enormous. To begin with, all the patients with spinal TB must be subjected to a review of a chest radiograph especially regarding classic and atypical features of pulmonary TB. Second, the presence of X-ray positivity must be an impetus to sputum smear, culture or molecular testing in cases of mild respiratory symptoms. Third, patients and attendants should be given infection-control counseling. Fourth, pulmonary involvement documentation can assist clinicians to categorize and increase adherence by describing the systemic ideation of TB.

There are limitations in this study. The number of the sample was small and limited to one center. Despite being useful, chest X-ray is less sensitive than the CT measurement of minute pulmonary lesions. All radiographically positive patients were not microbiologically confirmed. The control group comprised of symptomatic patients and might be not a reflection of the general healthy population. Nevertheless, the study will be of practical local value as well as indicating a clinically useful finding: the pulmonary-compatible TB-chest X-ray abnormalities are frequent in known-spinal TB.

Subsequent multicentric protocols ought to incorporate bigger cohorts, chest CT association, sputum GeneXpert measurements and follow-up after antituberculous treatment. Research also needs to determine whether systematic screening of their

chest among patients with spinal TB helps patients adhere to treatment more, lessens exposures in healthcare settings and enhances the identification of household contacts. In high estimates, like Pakistan, combined assessment of the spinal TB and pulmonary TB screening can lead to an enhancement in the individual patient treatment as well as in the population health results.

The current work can also be inaccurate in detecting the discrete parenchymal disease, as compared to research which involves the use of CT. However, the fact that a marked difference could be identified with the help of only the chest X-ray maximizes the usefulness of this method. The screening pathway might then start with chest X-ray in all cases of spinal TB with CT only if the symptoms are persistent, X-ray results are indeterminate, radiographic findings are far reaching or both should there be a suspicion of complications. This type of artificial strategy strikes a balance between diagnostic sensitivity and cost as well as resource constraints.

The results are applicable to patient education as well. Most patients can only think of TB as a lung disease and fail to recognize the connection between spinal disease and systemic infection. Presenting radiographic pulmonary results to patients and families can enhance acceptance of long-term antituberculous therapy and follow-up. It can also promote household assessment of contacts, enhanced home ventilation and compliance to directly observed treatment plans or monitored treatment plans. Moreover, the agreement of pulmonary involvement can assist the clinicians to elucidate why the treatment is necessary despite the enhancement of the spinal pain or post-operative stabilization.

The other significant implication relates to hospital infection control. Patients with spinal TB can be admitted to spine and orthopedic wards on long-term basis (extended treatment), undergo operations, become immobilized, or rehabilitated. Unless concomitant pulmonary TB is identified at an early stage, healthcare workers, attendants and close patients are at risk of exposure. Routine X-ray of the chest is cheap and can be done quickly prior to admission to common wards or prior to surgeries. With patients in need of masking, respiratory isolation, sputum collection or increased counseling being more likely to benefit, this straightforward measure can have a skewed advantage in a high-burden nation.

Another significant difference between pulmonary involvement and infectivity is also pointed out in the results. A noninfectious radiographic chest is no longer any positive radiograph that can establish bacteriological infectiousness, but indicates that a group that needs further respiratory sampling, molecular testing and clinical association. Clinical focus is frequently pre-eminently witness on back pain, neurological symptoms and deformity in spinal TB. It therefore follows that a lack of typical pulmonary presentation can cause clinicians to under-rate the risk of transmission. That we have found numerous X-ray-positive and smear-negative (or microbiologically unknown) patients is not surprising since smear testing is known to have limitations. It also advocates a layered diagnostic strategy whereby a combination of chest radiography, sputum smear, nucleic acid amplification testing and clinical judgment is employed, as opposed to the use of either individually.

CONCLUSION

Chest X-ray results indicating that the patient had pulmonary tuberculosis were significantly higher in patients who had spinal TB compared to symptomatic patients without spinal TB. The most frequent abnormality was upper-zone infiltrates/nodules, and the presence of previous TB history, elevated leukocyte count, chronic cough and positive sputum smear were related to radiographic positivity. Routine screening of all identified cases of spinal TB with the X-ray screening of the chest should be conducted to identify early signs of concomitant pulmonary disease, directed microbiological testing, enhance control over infections and promote overall management of tuberculosis.

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