ORIGINAL RESEARCH

Spontaneous Pneumothorax and Tuberculosis: An Institutional Based Study

[1]Dr. Animesh Dubey, [2]Dr. Ashok Sudam Bansode

[1,2]Associate Professor, Department of Pulmonary Medicine, L N Medical College & J K Hospital, Kolar Road, Bhopal, Madhya Pradesh, India

Corresponding Author
Dr. Ashok Sudam Bansode
Associate Professor, Department of Pulmonary Medicine, L N Medical College & J K Hospital, Kolar Road, Bhopal, Madhya Pradesh, India.

Received: 19 January, 2023 Accepted: 21 February, 2023

ABSTRACT

Background: The present study was conducted for evaluating occurrence of Spontaneous Pneumothorax (SP) secondary among TB patients.

Materials &Methods: The present study was conducted for evaluating occurrence of SP secondary among TB patients. Data from clinical reports of every patient who received treatment for TB and secondary spontaneous pneumothorax (SSP) at the department of Chest and TB were analy sed. Age, sex, socioeconomic status, comorbi dity, past health history, clinical information, a diagnosis of active TB, and whether or not the patient was receiving anti-TB medication were all taken from the medical files. In all patients, SSP was diagnosed based on straightforward thoracic radiography. Bacteriological evidence has supported the TB diagnosis. All the results were recorded on a Microsoft excel sheet and were subjected to statistical analysis.

Results: Pneumothorax was seen in 6 percent of the patients while hy dropneumot horax was seen in 4 percent of the patients. In all the patients, SSP was found to be unilateral. It was present on right side in 5 cases of pneumothorax while it was present in 3 cases of hydropneumothorax. On conventional radiography, out of 6 cases of pneumothorax, three patients had cavitary lesions and reticulonodular opacities. The average length of hospital stay was 31.5 days. Favourable clinical bacteriological and radiological outcomes were noted in only 4 cases of pneumothorax and 2 cases of hydropneumothorax.

Conclusion: When a diagnosis is delayed, tuberculous pneumothorax is typically linked to active cavitated tuberculosis. With chest drainage and antitubercular treatment, the outcome was almost favourable.

Key words: Pneumothorax, Tuberculosis..

INTRODUCTION

An ancient infectious disease, tuberculosis (TB) has affected humankind throughout history. Despite the introduction of medical TB treatment during the 20th century, TB is the leading cause of mortality among curable infections.[1- 3] This problem becomes more evident when considering the increasing incidence of human immunodeficiency virus/acquired immune deficiency syndrome.[4] These diseases have sped each other's progress, giving rise to the terms “co-epidemic” and “dual epidemic.” In view of these issues, with the increasing incidence of TB and improving TB survival, the incidence of TB complications that need surgery has increased and merits more thorough consideration.[5] Spontaneous pneumothorax (SP) is defined as the sudden presence of air in the pleural cavity without apparent external cause. The majority of cases can be classified as primary SP, ocurring in the young without associated pulmonary or general disease. The production mechanism of primary SP is the rupture of some subpleural pulmonary alterations known as blebs. Secondary SP (SSP) is associated with clinical or radiological evidence of significant lung disease.[6] Hence; under the light of above-mentioned data, the present study was conducted for evaluating occurrence of SP secondary among TB patients.

MATERIALS & METHODS

The present study was conducted in Department of Pulmonary Medicine, L N Medical College & J K Hospital, Kolar Road, Bhopal, Madhya Pradesh (India) for evaluating occurrence of SP secondary among TB patients. Data from clinical reports of every patient who received treatment for TB and secondary spontaneous pneumothorax (SSP) at the department of Chest and TB were analy sed. Age, sex, socioeconomic status, comorbidity, past health history (smoking, alcoholism, drug addiction, prior TB), clinical information (dyspnea, chest pain, fever, night

sweats, cough, expectoration, hemoptysis, asthenia, appetite loss, and weight loss), a diagnosis of active TB, and whether or not the patient was receiving anti-TB medication were all taken from the medical files. In all patients, SSP was diagnosed based on straightforward thoracic radiography. Bacteriological evidence has supported the TB diagnosis. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis.

RESULTS

A total of 100 patients with presence of pulmonary tuberculosis were analyzed. The mean age of the patients was 41.5 years. Out of these 100 patients, 68 patients were males while the remaining were females. 62 percent of the patients were of rural residence while the remaining were of urban residence. 18 percent of the patients belonged to lower socio-economic status. Previous history of treated tuberculosis was present in 5 percent of the patients. 10 percent of the patients were diabetic while 8 percent of the patients were hypertensive. Active smoking history was seen in 9 percent of the patients. Chest pain, cough, dys pnea and hemo ptysis were the most common clinical features seen. Other clinical features encountered were asthenia, weight loss, episodic fever, night sweats and loss of appetite. Pneumo tho rax was seen in 6 percent of the patients while hy dropneumothorax was seen in 4 percent of the patients. In all the patients, SSP was found to be unilateral. It was present on right side in 5 cases of pneumothorax while it was present in 3 cases of hydropneumothorax. On conventional radiography, out of 6 cases of pneumothorax, three patients had cavitary lesions and reticulonodular opacities. The average length of hospital stay was 31.5 days. Favourable clinical bacteriological and radiological outcomes were noted in only 4 cases of pneumothorax and 2 cases of hydropneumothorax.

Table: 1 Demographic data

Variable		Number	Percentage
Mean age (years)		41.5	
Gender	**Males**	68	68
	Females	32	32
Residence	**Rural**	62	62
	Urban	38	38
Socio-economic status	**Upper middle class**	49	49
	Lower middle class	33	33
	Lower class	18	18

Table: 2 Co-morbid conditions

Variable	Number	Percentage
Diabetes	10	10
Hypertension	8	8
Active smoking habit	9	9

Table: 3 Incidence of SSP

Variable	Number	Percentage
Pneumothorax	5	5
Hydropneum ot horax	3	3
Total	8	8

DISCUSSION

Secondary spontaneous pneumot horax (SSP) is one of the major complications of pulmonary tuberculosis (TB), and it can be a life-threatening condition if it progresses to tension pneumot horax. The incidence of SSP in pulmonary TB was reported to be 1.3–5%. Correct initial assessment and prompt intervention will prevent a hemodynamic deterioration in tension pneumothorax. The treatment approach usually includes immediate invasive management, including large-bore chest tube insertion and video-assisted thoracoscopic surgery. However, in clinical settings with limited resources, this cannot be done promptly.[7-9]The estimated incidence of spontaneous pneumothorax associated with active pulmonary tuberculosis is only approximately 1–2%. Other pulmonary infections, such as necrotizing bacterial pneumonias and particularly Pneumocy stis jiroveci pneumonia in patients with acquired immunodeficiency syndrome (AIDS), are associated with spontaneous pneumothorax. Latent tuberculosis infection is characterized by an adaptive and specific immune response to Mycobacterium tuberculosis (MTB) complex antigens, with no evidence of clinically active TB. The microorganisms that cause latent infection can persist in an inactive phase for several decades, even during the entire life of the host; however, in approximately 5% of all infected individuals, the latent infection progresses to active replication and causes TB disease.[10,11]Hence; under

the light of above-mentioned data, the present study was conducted for evaluating occurrence of SP secondary among TB patients. A total of 100 patients with presence of pulmonary tuberculosis were analyzed. Mean age of the patients was 41.5 years. Out of these 100 patients, 68 patients were males while the remaining were females. 62 percent of the patients were of rural residence while the remaining were of urban residence. 18 percent of the patients belonged to lower socio-economic status. Previous history of treated tuberculosis was present in 5 percent of the patients. 10 percent of the patients were diabetic while 8 percent of the patients were hypertensive. Active smoking history was seen in 9 percent of the patients. Pneumothorax was seen in 6 percent of the patients while hydropneumothorax was seen in 4 percent of the patients. In a previous study conducted by Kwas, H et al, authors analy sed the experience of SP secondary to TB in patients who were hospitalized. The mean age of patients was 38,5±19 years. Two patients had a history of pulmonary tuberculosis. The chest x-ray showed a pneumothorax in 5 cases, a hydropneumothorax in 5 cases and cavitary lesions accompanying SP in 5 cases. Acido -alcoolo-resistant bacilli were isolated in the expectorations in all patients. Treatment associated antitubercular chemotherapy in compliance with the national plan of struggle against tuberculosis, chest drainage and respiratory physiotherapy. The average duration of chest tube drainage was 23 days. Two patients underwent surgery. The course was favourable in 5 cases. A delay (>1month) to bacilli negativation was noticed in 2 patients and pachypleuritis requiring surgical pleural decortications in 2 patients. Tubercular pneumo thorax was always associated with active cavitated tuberculosis.[12]In the present study, in all the patients, SSP was found to be unilateral. It was present on right side in 5 cases of pneumothorax while it was present in 3 cases of hydropneumo thorax. On conventional radiography, out of 6 cases of pneumothorax, three patients had cavitary lesions and reticulonodular opacities. The average length of the hospital stay was 31.5 days. Favourable clinical bacteriological and radiological outcomes were noted in only 4 cases of pneumothorax and 2 cases of hydropneu mot horax. In another similar study conducted by Freixinet JL et al analysed the experience of SP in patients diagnosed with TB in our hospital between 1989 and 2010. Out of 872 patients treated for SP during this period, 47 (5.4%) had TB antecedents, 21 with active TB (0.95% of the 2,089 TB cases diagnosed during this period) and 26 with residual inactive TB. 46 cases were treated with pleural drainage (PD): 40 (85%) with only one PD, two with two, and four with three. The mean ± SD length of PD treatment was 12.9 ± 11.3 days. In 11 (23%) cases, a relapse of SP occurred, with no statistical relationship between the different studied variables. In 13 (28%) cases, it became necessary to carry out a resection (atypical segmentec to my in all cases) for persistent air leaks with PD. Survival statistics were unfavourable only in elderly patients and those infected with HIV. They conclude that the treatment of SP secondary to TB with PD is usually a sound response, with a good general prognosis and a low percentage of cases that require another PD and surgical treatment.[13]

CONCLUSION

When a diagnosis is delayed, tuberculous pneu mothorax is typically linked to active cavitated tuberculosis. With chest drainage and antitubercular treatment, the outcome was almost favourable.

REFERENCES

1. Fox W. The chemotherapy of pulmonary tuberculosis: a review. Chest 1979;76(6 Suppl):785–796.
2. Mitchison DA. Treatment of tuberculosis: the Mitchell lecture 1979. J R Coll Physicians Lond 1980;14(2):91–95, 98-99.
3. Dye C, Williams BG. Eliminating human tuberculosis in the twenty-first century. J R Soc Interface 2008;5(23):653–662.
4. Corbett EL, Watt CJ, Walker N, Maher D, Williams BG, Raviglione MC, et al. The growing burden of tuberculosis: global trends and interactions with the HIV epidemic. Arch Intern Med 2003;163(9):1009–1021.
5. Lucas SB, Hounnou A, Peacock C, Beaumel A, Djomand G, N' Gbichi JM, et al. The mortality and pathology of HIV infection in a west African city. AIDS 1993;7(12):1569–1579.
6. Mezghani S, Abdelghani A, Njima H, et al. Tuberculous pneumothorax. Retrospective study of 23 cases in Tunisia. Rev Pneumol Clin 2006; 62: 13–18
7. Shamaei M, Tabarsi P, Pojhan S, Ghorbani L, Baghaei P, Mar jani M, et al Tuberculosis-associated secondary pneumothorax: a retrospective study of 53 patients. Respir Care. 2011 Mar;56(3):298–302.
8. Ak to ğu S, Yorgancioglu A, Cirak K, Köse T, Dereli SM. Clinical spectrum of pulmonary and pleural tuberculosis: a report of 5,480 cases. Eur Respir J. 1996 Oct;9(10):2031–5.
9. Salazar AJ, Aguirre DA, Ocampo J, Camacho JC, Díaz XA. Evaluation of three pneumo thorax size quantification methods on digitized chest X-ray films using medical-grade grayscale and consumer-grade color displays. J Digit Imaging. 2014 Apr;27(2):280–6.
10. Belmonte R, Crowe HM. Pneumothorax in patients with pulmonary tuberculosis. Clin Infect Dis. 1995;20(6):1565.
11. World Health Organization. Global TB Report 2018 [Internet] WHO; 2018. Available at: https://www.tballiance.org/why-new-tb-drugs/global-pandemic.
12. Kwas, H., Zendah, I., & Ghedira, H. Spontaneous pneumothorax secondary to tuberculosis. La Tunisie medicale 2017;95(4), 276–279.
13. Freixinet, J. L., Caminero, J. A., Marchena, J., Rodríguez, P. M., Casimiro, J. A., & Hussein, M. Spontaneous pneumothorax and tuberculosis: long-term follow-up. The European respiratory journal 2011; 38(1): 126–131.