



“DETERMINE THE RISK FACTORS OF SPONTANEOUS PNEUMOTHORAX AT TERTIARY CARE CENTER BIHAR”

General Medicine

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ABSTRACT

BACKGROUND: Primary spontaneous pneumothoraces (PSP) affect patients who do not have clinically apparent lung disorders. Secondary pneumothoraces occur in the setting of underlying pulmonary disease. spontaneous pneumothorax represents a common clinical problem.

MATERIAL AND METHODS: A total of 100 patients, including both males and females, in All india institute of medical sciences Patna Bihar. admitted during the given period to the hospital with a diagnosis of spontaneous Pneumothorax (SP) were included in the study after applying to the inclusion and exclusion criteria.

RESULTS: COPD was the most common cause (45.6%) followed by Tuberculosis (30%). Silicosis was seen in 18.9% of SSP cases. Other less common causes were Bronchiectasis (3.3%), Pneumonia (1.1%) and Malignancy (1.1%).

CONCLUSION: Secondary spontaneous pneumothorax is far more common than primary spontaneous pneumothoraces and COPD is the predominant underlying cause of secondary spontaneous pneumothorax followed by pulmonary tuberculosis. We also found that silicosis is a significant contributor to secondary spontaneous pneumothorax, after COPD and pulmonary tuberculosis.

KEYWORDS

COPD, TB, Etiology

INTRODUCTION:

Pneumothorax is defined as the presence of air in the pleural space. Although intrapleural pressures are negative throughout most of the respiratory cycle, air does not enter into the pleural space because the sum of all the partial pressures of gases in the capillary blood. A case of pneumothorax is a common medical emergency which can itself be serious and may endanger the life of the patient because of respiratory insufficiency.

It is classified as spontaneous (not caused by trauma or any obvious precipitating factor), traumatic, or iatrogenic. Spontaneous pneumothoraces, which occur in the absence of thoracic trauma, are classified as primary or secondary.

Primary spontaneous pneumothoraces (PSP) affect patients who do not have clinically apparent lung disorders.

Secondary pneumothoraces occur in the setting of underlying pulmonary disease.

PSP has an incidence of 7.4 to 18 cases per 100,000 population each year in males, and 1.2 to 6 cases per 100,000 population each year in females. PSP typically occurs in tall, thin subjects and rarely occurs in persons over the age of 40 years. Other risk factors

are male sex and cigarette smoking. Causes of PSP include airway diseases like emphysema, cystic fibrosis, infectious diseases like tuberculosis, pneumocystis carinii, interstitial lung diseases, connective tissue diseases, cancer and thoracic endometriosis.² During the last three decades most of the western literature opined that rupture of sub pleural blebs or bullae is the commonest cause of primary spontaneous pneumothorax (PSP) and chronic obstructive pulmonary disease (COPD), Pneumocystis carinii pneumonia related to infection with human immunodeficiency virus (HIV) are the most common conditions associated with secondary pneumothorax.³ Due to rapid decline in incidence of tuberculosis in the western countries, spontaneous pneumothorax of tuberculous etiology is encountered rarely. On the other hand, studies conducted in India reveals tuberculosis as a predominant etiology in causes of pneumothorax. The different causative factors producing pneumothorax depends upon prevalence rates for the diseases in that country. The prevalent impression amongst physicians in this country is to regard tuberculosis as almost invariable cause of pneumothorax, but actually it may not be so. Hence in this study, we have tried to analyze the etiology, clinical profile, management, and outcome of spontaneous pneumothorax with or without fluid, pus or blood in the pleural cavity (hydropneumothorax, pyopneumothorax and hemopneumothorax) among a significant number of patients attending the department of pulmonary medicine.

MATERIAL AND METHODS

Study Area – All india Institute Of Medical Sciences Patna Bihar.

Duration of Study – 1 year

Study Design - Hospital based prospective type of observational study was conducted and proper management were given to each patient as per BTS guidelines 2010.

Study Population – Patients admitted in General ward, ALL india institute of medical sciences patna bihar.

Study Subjects - On the basis of Inclusion and exclusion criteria, patients reporting to department of

Study subjects - A total of 100 patients, including both males and females, admitted during the given period to the hospital with a diagnosis of spontaneous Pneumothorax (SP) were included in the study after applying to the inclusion and exclusion criteria.

INCLUSION CRITERIA

All patients having spontaneous pneumothorax admitting in Institute of Aiiims patna bihar.

EXCLUSION CRITERIA

Patients having traumatic pneumothorax. Patients having hydropneumothorax.

Patients having bilateral pneumothorax. Patients having recurrent pneumothorax. Pregnant women Patient who do not give consent.

STATISTICAL ANALYSIS

Data were entered in MS EXCEL sheet and subjected to statistical analysis. The qualitative data were expressed in proportion and percentage. The quantitative data were expressed as means and Standard deviation. The difference in proportions was analyzed by using Chi-square test. The difference in mean was analyzed by using unpaired t-test. The significance level for tests has determined as 95% ($P < 0.05$). MED CALC 12.2.1.0 version software has used for all statistical analysis.

OBSERVATIONS

Table 1: Rural or Urban distribution of spontaneous pneumothorax patients

Residence	PSP	SSP	Total
Rural	8(80.00%)	66(73.3%)	74
Urban	2(20.00%)	24(26.67%)	26
Total	10	90	100

Chi-square = 0.006 with 1 degree of freedom; P = 0.939 (NS)

This table is showing the rural urban distribution of study subjects. Most of the PSP patients (80%) were from rural areas. Among SSP patients also most patients

(73.3%) were from rural areas. Chi square test application showed that this difference was not found to be statistically significant (>0.05).

Table 2: Age & BMI wise distribution of spontaneous pneumothorax patients

Variable	PSP	SSP	p-value
Age	28.9±10.24	44.61±15.82	0.003(HS)
BMI	17.57±2.41	16.62±2.89	0.318

Most of the PSP cases were in young age group. Most (90%) of the PSP cases were below 40 years of age. SSP cases showed two peaks. Most cases (24.4%) were in 21 – 30 years age group (1 st peak) followed by 51-60 years age group (23.3% - 2 nd peak). The mean age of Subjects with SSP was higher (44.61 years) as compared to PSP subjects (28.9%). Application of t test showed that this difference was statistically significant.

The mean BMI was higher in patients with PSP (17.57 Kg/m²) as compared to patients with SSP (16.62 Kg/m²) and this difference was not found to be statistically significant.

Table 3: Etiology of Secondary spontaneous pneumothorax

Etiology	No of patients	Percentage
COPD	41	45.6
TB	27	30
Silicosis	17	18.9
Bronchiectasis	3	3.3
Pneumonia	1	1.1
Malignancy	1	1.1
Total	90	100.00

Above table shows the etiology of secondary spontaneous pneumothorax among study subjects. COPD was the most common cause (45.6%) followed by Tuberculosis (30%). Silicosis was seen in 18.9% of SSP cases. Other less common causes were Bronchiectasis (3.3%), Pneumonia (1.1%) and Malignancy (1.1%).

DISCUSSION

The present study was conducted at Department of General Medicine, All india institute of medical sciences Patna Bihar to assess the etiology, management modalities and their outcomes in patients with spontaneous pneumothorax.

A total of 100 patients having radiologically confirmed pneumothorax who presented during the period of One year were included in this study.

In the present study, an underlying etiology has been found in 90% (90/100) of patients while only 10% (10/100) of patients were in the group of primary spontaneous pneumothorax.

According to Ferraro P et al⁴, primary spontaneous pneumothorax was found in 80% and secondary spontaneous pneumothorax was found in 20% of the cases of spontaneous pneumothorax. A retrospective study about spontaneous pneumothorax carried out by Sousa C et al⁵ at Santo Antonio Hospital reported primary spontaneous pneumothorax and secondary spontaneous pneumothorax to be 63.6% and 36.4%, respectively.

The present study reported that COPD (45.6 %) was the leading underlying pulmonary disorder with 41 out of 90 patients of secondary spontaneous pneumothorax followed by pulmonary tuberculosis (30%) 27 out of 90 patients which is quite discordance with previous studies from India. Agnihotri et al⁶ reported pulmonary tuberculosis to be the most common cause of spontaneous pneumothorax (57.5%) and Gupta et al⁵ reported pulmonary tuberculosis in 41.7% to be the most common etiology of secondary spontaneous pneumothorax.

CONCLUSION

Secondary spontaneous pneumothorax is far more common than primary spontaneous pneumothoraces and COPD is the predominant

underlying cause of secondary spontaneous pneumothorax followed by pulmonary tuberculosis. We also found that silicosis is a significant contributor to secondary spontaneous pneumothorax, after COPD and pulmonary tuberculosis. Pneumothorax associate with interstitial pneumothorax is less frequent.

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