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Diagnostic role of fiberoptic bronchoscopy in various respiratory diseases at esic medical college hospital Sanath Nagar

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***Abstract*---**Background: Fiber-optic bronchoscopy is a safe and effective diagnostic and therapeutic technique for pulmonary disease diagnosis and treatment. The purpose of this descriptive study was to determine the demographic profiles, indications, bronchoscopic findings, and diagnosis of individuals who had a bronchoscopic examination. Materials and Methods: For a year, 150 patients received bronchoscopies at the ESICMCH hospital in Sanath Nagar, Hyderabad, in the department of pulmonary medicine. All of the subjects underwent a thorough clinical history, physical examination, and standard tests. Sputum examination (for acid fast bacilli (AFB) staining, gramme staining, culture/sensitivity, KOH staining, malignant cells), hematological examination, and coagulation profile were performed on all patients. Fiberoptic bronchoscopy was then performed on all of the patients. Under topical anesthetic (2% lignocaine), flexible bronchoscopy was done with a fiberoptic scope via

the transnasal route. Pulse oximetry was used to measure oxygenation throughout the process. After a thorough inspection of the endobronchial tree, appropriate samples such as bronchoscopic aspirate, brushing, and biopsy were taken, depending on the lesion. Depending on the clinical diagnosis and bronchoscopic findings, samples were submitted to cytology and histology. Results: Out of 150 patients, 100 (66.67%) were males and 50 (33.33%) were females. The age group of maximum patients was above 50 years. Mean age was 52.2 years. Out of 150 patients, 48% were smokers (present and past) and 52% were non-smokers. Only 24.67% of patients were consuming alcohol. Most common clinical presentation of the patients was Cough (99.33%). Hemoptysis, weight loss, shortness of breath were other common symptoms found in 30%, 35.33% and 72% of patients respectively. On cytology malignancy was confirmed with 14.7%. On over samples sent to histopathology neoplastic changes were found in 53 (86.33%) cases while non neoplastic changes were found in 13.2% of cases. Out of Neoplastic confirmed cases maximum cases were adenocarcinoma followed by squamous cell carcinoma. Conclusion: Fiberoptic bronchoscopy is very helpful in determining the cause of many lung illnesses.

***Keywords*---**FOB (fiberoptic bronchoscopy), Histopathology, Lung malignancy.

Introduction

Since 1965 Fiber Optic Bronchoscopy (FOB) has revolutionized lung disease diagnosis and understanding and has become the diagnostic procedure of choice in pulmonary medicine [1]. FOB is a minimally invasive treatment that requires only a small amount of sedation. With proper preparation and monitoring, it is a relatively safe treatment with low rates of complications [2,3]. This method provides for a thorough examination of the bronchial tree for endobronchial lesions in cases of suspected bronchogenic carcinoma, as well as for lung cancer staging. It can also be used to remove foreign bodies by the use of albeit rigid bronchoscopy is preferable. It also aids in the identification of pathogens in situations of diffuse or localized lung infections in both immuno-competent and immuno-compromised hosts. FOB has a high diagnostic yield, albeit it varies depending on the indication and procedure [3-6].

Bronchial biopsies, bronchial brushings, aspiration, transbronchial lung biopsies, and transbronchial needle aspirations are some of the procedures used to collect samples, and these advantages coupled increase the diagnostic value of bronchoscopy [7]. Apart from tuberculosis, lung cancer, pneumonia, and interstitial lung disorders, FOB has been demonstrated to have diagnostic relevance in opportunistic pulmonary infections in immune weak patients, including HIV positive patients [8]. Isolating M. tuberculosis in stained smears from clinical samples is the first step in diagnosing a probable case of pulmonary tuberculosis (i.e. expectorated sputum). Sputum positive yields range from 16 to 50 percent in most facilities, even after a comprehensive investigation. Despite

persistent clinical and radiological signs suggestive of pulmonary tuberculosis, a considerable fraction of the population remains negative [9]. In such sputum smear negative instances, FOB plays an important role in diagnosing tuberculosis. Endobronchial biopsy, bronchoalveolar lavage (BAL), or brush cytology can all be used to provide a conclusive diagnosis of lung cancer, especially when there is an endobronchial lesion, and a sufficient tissue sample is available. Hence, the purpose of this study is to evaluate the diagnostic role of fiberoptic bronchoscopy in various lung diseases and to know type of lung cancer, infections and causative bacteria/fungal, and drug sensitivity.

Materials and Methods

Present cross sectional study was conducted from January 2021 to December 2021. Data was collected on 150 patients prospectively who were suspected of having pneumonia, pulmonary tuberculosis, or lung cancer and were admitted in wards of Pulmonary Medicine Department at ESICMCH hospital in Sanath Nagar, Hyderabad. Patients with undetected opacities on chest radiographs, such as consolidation, hilar mass, collapse, and cavity, were also included in the study. All of the subjects underwent a thorough clinical history, physical examination, and standard tests. Sputum examination (for acid fast bacilli (AFB) staining, gramme staining, culture/sensitivity, KOH staining, malignant cells), hematological examination, and coagulation profile were performed on all patients. If there were any abnormalities, they were excluded form the study. Before the treatment, all of the patients had chest X-rays taken in both the PA and lateral views to determine the site of the lesion. In other situations, a CT scan of the thorax was conducted. Fiberoptic bronchoscopy was then performed on all of the patients. Under topical anesthetic(2% lignocaine), flexible bronchoscopy was done with a fiberoptic scope via the transnasal route.

Pulse oximetry was used to measure oxygenation throughout the process. After a thorough inspection of the endobronchial tree, appropriate samples such as bronchoscopic aspirate, brushing, and biopsy were taken, depending on the lesion. Depending on the clinical diagnosis and bronchoscopic findings, samples were submitted to cytology and histology. Present study was undertaken after approval from Institutional ethical Committee. Data was entered in MS excel and then analysed accordingly.

Results

Out of 150 patients, 100 (66.67%) were males and 50 (33.33%) were females. The age group of maximum patients was above 50 years. Mean age was 52.2 years. Out of 150 patients, 48% were smokers (present and past) and 52% were non-smokers. Only 24.67% of patients were consuming alcohol (Table1).

Table 1: Distribution of Patients (N=150)

Variables	Number	%
Age in years(Mean ± SD)	52.2 ± 13.39	

Gender Males Females	 100 50	 66.67 33.33
H/O Smoking	72	48
H/O Alcohol Consumption	37	24.67
H/O Comorbidities	68	45.33

Most common clinical presentation of the patients was Cough (99.33%). Hemoptysis, weight loss, shortness of breath were other common symptoms found in 30%, 35.33% and 72% of patients respectively. Fever and chest pain were other complaints found in 61.33% and 51.33% of patients respectively. Maximum patients presented with more than one symptom and some more than two symptoms (Table 2).

Table 2: Clinical Presentation of Patients (N=150)

Clinical Parameters	Number	%
Cough	149	99.33
Hemoptysis	45	30
Weight loss	53	35.33
Shortness of breath	108	72
Fever	92	61.33
Chest pain	77	51.33

Table 3: Diagnosis of Fiberoptic Bronchoscopy

Findings	Fiberoptic Bronchoscopy N(%)
Inconclusive	53(35.33)
Endobronchial Growth	41(27.33)
Non-specific Inflammation	37(24.67)
Normal	19(12.67)
Total	150(100)

According to fiberoptic bronchoscopy; endobronchial growth was found in 41 (27.33%) of cases and inconclusive cases were 53(35.33%). (Table 3).

Table 4: Bronchial Wash for microbial analysis

Microbiological Findings	
Tuberculosis	38(25.3)
Other bacterial • Streptococcus • Pseudomonas • Klebsiella • Actinobacter	 5(3.3) 8(5.3) 5(3.3) 2(1.3)
Fungal	5(3.3)
No Growth	28(18.6)
Others(Cancer etc)	59(39.3)
Total	150(100)

Above table 4 shows that when the bronchial lavage was sent to

Table 5: Diagnosis on Cytology

Findings	Cytology N(%)
Malignancy Confirmed	22(14.7)
Malignancy Suspected	25(16.6)
No Malignancy	90(60.0)
Inconclusive	13(8.7)
Total	150(100)

Table 5 shows that malignancy was confirmed with 14.7%, with no malignancy in 60%, while malignancy suspected and inconclusive was seen in 16.6% and 8.7 % respectively.

Table 6: Diagnosis of Histopathology

Findings	Histopathology N=61(%)
Carcinoma	53(86.8)
• Adenocarcinoma	34(55.7)
• Squamous Cell Carcinoma	18(29.5)
• Carcinoid Tumor	1(1.6)

Non-specific Inflammation	3(4.9)
Others	5(8.1)
Total	61(100)

Out of 150 cases, 61 underwent histopathology i.e. 40.6%. According to histopathology; neoplastic changes were found in 53 (86.33%) cases while non neoplastic changes were found in 13.2% of cases (Table 5). Out of Neoplastic confirmed cases maximum cases were adenocarcinoma followed by squamous cell carcinoma.

Discussion

Flexible fiberoptic bronchoscopy (FOB) has revolutionized lung disease diagnosis and understanding, and is now the most widely used diagnostic procedure in pulmonary medicine. FOB can be performed under local anesthetic in a variety of clinic/hospital settings to provide maximum tracheobronchial tree vision, and if done correctly, can be a completely safe surgery. Hence, the present study is done to evaluate the diagnostic role of fiberoptic bronchoscopy in various lung diseases and to know type of lung cancer, infections and causative bacteria/fungal, and drug sensitivity.

It was found that cough was the most common reason for bronchoscopy in this study (88 percent), which is similar to a study by Prakash UB et al[9]. The majority of individuals with bronchogenic cancer, according to epidemiological research, show signs and symptoms of COPD [10,11].

Non-neoplastic lesions were found in the majority of 97 patients (64.67 %), while neoplastic lesions were seen in 35.33 % of instances. In other research, Hansen et al[12] showed 31% of cases to be neoplastic and 62% to be non-neoplastic, whereas Abdul Aziz et al [13] found 28% to be neoplasm and 72% to be non-neoplastic disease. These findings were approximately similar to our study. Study by Sharma et al[14]in New Delhi confirmed malignancy in 20% of the cases while in our study it was 14.7% when cytology was compared this may be due to the different study population.

Bronchoscopy is a safe and effective method of diagnosing pulmonary disorders such as bronchogenic carcinoma, tuberculosis, and various interstitial lung diseases It's worth noting that, just as with bronchoscopy, experience and skills accumulate over time to ensure adequate sampling. Given that such patients' care must be multidisciplinary, the authors of this study recognise that histopathological techniques must be performed by personnel with relevant capabilities and performance to ensure that the final diagnosis is fully determined.

Conclusion

Fiberoptic bronchoscopy can be used to diagnose lung disorders such as malignancies and granulomatous lesions with great success. It's highly helpful in determining the causes of various lung disorders. The importance of bronchoscopy and related procedures in the diagnosis of different lung disease is demonstrated in this study. Fibre optic bronchoscopy gives wide diagnostic array where diagnosis is done on visualization and if in query bronchial lavage as a sample can be used for both microbiological culture and cytology. If required Fibre optic bronchoscopy helps in taking histopathological samples which are gold standard for diagnosis.

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