Original Research Article

Study of bronchoalveolar lavage for a provisional diagnosis in respect with endobronchial biopsy.

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Abstract:

Background & Method: The aim of the study is to Study of bronchoalveolar lavage for a provisional diagnosis in respect with endobronchial biopsy. All the cases of suspected bronchial malignancy were included in present study in which broncho-alveolar lavage (BAL) and bronchial biopsy samples were received in pathology department for evaluation. Respective bronchial brushings & sputum samples were also studied where ever available.

Result: Of the 72 confirmed cases of carcinoma of lung, BAL cytodiagnosis was positive in 19 cases. Thus, in our series, the pickup rate of lung cancer by cytology was 26.3%. In 30 Squamous cell carcinoma patients, BAL cytology was positive for malignancy in 8 (26.6%) cases, for 18 cases of adenocarcinoma 5 (27.7%) cases were positive, for 10 cases of small cell carcinoma 4 (40%) were positive and for 14 cases of miscellaneous carcinoma's of lung, 2 cases (14.2%) were positive on BAL cytology. Correctly diagnosed adenocarcinoma of lung on BAL were 27.7%, sqaumous cell carcinoma were 26.6%, small cell carcinoma were 40% and BAL cytodiagnosis from miscellaneous tumor can only be made in 14.2% cases.

Conclusion: Bronchial brushing have better sensitivity than BAL for diagnosis of lung carcinoma. Sputum is less sensitive than bronchial brushing for diagnosis of lung carcinoma. Commonest lung carcinoma in malwa region is Squamous cell carcinoma.Thus to achieve correct and timely diagnosis, combination of investigations including bronchial biopsy, BAL, bronchial brushing and sputum examination should be performed wherever feasible.

Keywords: bronchoalveolar, lavage, diagnosis & endobronchial biopsy.

Study Designed: Observational Study.

1. Introduction

Lung cancer is the most commonly diagnosed cancer annually since 1985. Worldwide, there are 1.61 million new cases of lung cancer per year, with 1.38 million deaths, making lung cancer the leading cause of cancer-related mortality[1]. In India, approximately 63,000 new lung cancer cases are reported each year. The major risk factor for developing lung cancer is tobacco use and this disease is often viewed solely as a smoker's

disease. However, a significant number of patients with lung cancer have no history of smoking[2].

According to a study conducted by V. Noronha et al, the mean age of the patients suffering from lung cancer is 56 years with a range from 30-80 years. The mean age of non-smokers was significantly lower than that of smokers (53 years) [3]. Eleven percent of patients were in the 0-40 age group, 57% in the 40-60 age group, and 32% patients were above 60 years of age. A larger proportion of non-smokers with lung cancer were noted in the younger age range. 75% of lung cancer patients below the age of 40 years were non-smokers as opposed to only 40% of patients over 60 years of age[4]. Male: female ratio is approximately 3.5:1 (77.7% male, 23.3% female). A larger proportion of females (88.1%) were non-smokers as compared to only 41.8% of males who were non-smokers[5].

Bronchial biopsies cannot be performed in more peripheral sites or in patients at risk of haemorrhage. So alternative method for obtaining diagnosis are sometime required. BAL, brushing and fine needle aspirations may complement tissue biopsies in the diagnosis of lung cancer[6]. BAL is a safer technique and the malignant cells can be readily recognized and typed. There is still disagreement as to the value and reliability of BAL and brush cytology in comparison with histology for the diagnosis of malignancy[7].

2. Material & Method

The present study was conducted in department of Pathology at Sri Aurobindo institute of medical sciences & Post graduate Institute, Indore over a period of 2 years from January 2012 to December 2013.

All the BAL, bronchial brushings, sputum & bronchial biopsy samples received in pathology department in study period were collected & further processed as follows

Sterile wide mouth containers of 30 ml capacity with label to write details of patient like name, registration number, ward number, date of sample collection were provided to department of Respiratory Medicine for collection of sputum & BAL samples.

All the cases of suspected bronchial malignancy were included in present study in which broncho-alveolar lavage (BAL) and bronchial biopsy samples were received in pathology department for evaluation. Respective bronchial brushings & sputum samples were also studied where ever available.

INCLUSION CRITERIA
- First time visiting patients.
- Clinically suspicious adult cases of bronchial cancer.
- Patients whose BAL and bronchial biopsy both were received.

EXCLUSION CRITERIA
- Patients of paediatric age group.
- Patients with known inflammatory lung disease.
- Patient with lung mass with no endobronchial component.
- Patients whose either BAL or bronchial biopsy was not received.
- Inadequate bronchial biopsy sample.
- Previously diagnosed cases of carcinoma lung or bronchial carcinoma.

3. Results

Table 1.Distribution of cases on the basis of histology, cytology and combined study.

Individual Histological diagnosis	Individual Cytological diagnosis	Diagnosis by Combined study
77/117	23/117	81/117

Of 117 cases combined study of BAL and endobronchial biopsy study was done. A conclusive diagnosis was made on 81 cases. Of these, the present study was done on 72 cases which were histologicaly diagnosed as malignancy, compared with their respective BAL samples, and with bronchial brushing and sputum samples, whenever available.

Mean age for 117 cases of combined study BAL & biopsy examination in our study is 56.5 years. The age of patients ranged from 28 to 90 years, which includes cases of lung carcinoma and infections. Sex ratio for 117 cases of combined study is 1:3.5.

Table 2.Incidence of lung carcinoma on histological examination of 72 cases.

Type of tumour	Incidence
Squamous cell carcinoma	41.6% (30)
Adenocarcinoma	25% (18)
Small cell carcinoma	13.8% (10)
Carcinoma not specified	06 (8.3%)
Carcinoid tumor	01 (1.38%)
Round cell tumor	1 (1.38%)

Metastasis from Renal cell carcinoma	1 (1.38%)
Metastasis from Hepatocellular carcinoma	1 (1.38%)
Suspicious of malignancy	4 (5.5%)
TOTAL	72 (100%)

Table 3. Diagnostic efficacy of BAL cytology in different type of carcinoma

TYPE OF CARCINOMA	TOTAL/HISTOLOGICAL DIAGNOSIS	BAL CYTODIAGNOSIS
SQUAMOUS CELL CARCINOMA	30	8 (26.6%)
ADENOCARCINOMA	18	5 (27.7%)
SMALL CELL CARCINOMA	10	4 (40%)
OTHER TUMOR	14	2 (14.2%)
TOTAL	72	19 (26.3%)

Of the 72 confirmed cases of carcinoma of lung, BAL cytodiagnosis was positive in 19 cases. Thus, in our series, the pickup rate of lung cancer by cytology was 26.3%. In 30 Squamous cell carcinoma patients, BAL cytology was positive for malignancy in 8 (26.6%) cases, for 18 cases of adenocarcinoma 5 (27.7%) cases were positive, for 10 cases of small cell carcinoma 4 (40%) were positive and for 14 cases of miscellaneous carcinoma's of lung, 2 cases (14.2%) were positive on BAL cytology.

Table 4: BAL cytodiagnosis of histologicaly proven specific carcinoma's.

CYTOLOGICAL DIAGNOSIS	ADENOCARCINOMA	SQUAMOUS CELL CARCINOMA	SMALL CELL CARCINOMA	OTHER
Malignant fluid	5 (27.7%)	8 (26.6%)	4 (40%)	02 (14.2%)

Acute inflammatory lesion	-	9 (30%)	1 (10%)	04 (28.5%)
Chronic inflammatory lesion	4 (22.2%)	-	-	03 (21.4%)
Mixed inflammatory cell lesion	4 (22.2%)	9 (30%)	2 (20%)	02 (14.2%)
Normal	4 (22.2%)	2 (6.6%)	2 (20%)	02 (14.2%)
Inadequate sample	1 (5.5%)	2 (6.6%)	1 (10%)	01 (7.14%)
TOTAL	**18**	**30**	**10**	**14**

In our study, correctly diagnosed adenocarcinoma of lung on BAL were 27.7%, sqaumous cell carcinoma were 26.6%, small cell carcinoma were 40% and BAL cytodiagnosis from miscellaneous tumor can only be made in 14.2% cases.

4. Discussion

In our study sensitivity of bronchial brushing is 54.16%, which is in concordance with Cheng Wang et al 61.9%, and with Gaber K A 41%. Two other studies conducted by Gaur D S and Anupam sarma concluded higher bronchial brushing sensitivity percentage of 87.3 and 71.43 respectively. A "false negative" finding in bronchial brushing study can be expected whenever the nylon brush is inaccurately placed or the bronchus draining the lesion is obstructed[8].

Comparison of the cytological characters of bronchial brushings and BAL showed that cellularity of the smear was greater in brush specimens with numerous columnar cells noted against a clear background whereas BAL samples tended to shed mostly single malignant cells with occasional cell clusters which were larger in brush than in washing samples.

In bronchial brushing the surface of the malignant lesion is scraped by the brush, the cells retrieved show better preserved morphological details in comparison to the cells which have already exfoliated into the bronchial cavity. Thus this technique manages to 'dislodge' the cells from the surface of those well differentiated malignant lesions too, which do not exfoliate cells readily. Thus, the chances of getting adequate diagnostic cytological sample by BB greatly increase in comparison to BAL samplings. Bronchial brushing is a much superior technique in the diagnosis and morphological typing of lung cancers, as it demonstrates far better Specificity, Sensitivity and Accuracy, in comparison to BAL[9].

Sputum cytology was positive in 1 of 3 confirmed cases of carcinoma lung. Thus, the sensitivity (pick up rate) was 33.3% this is comparable with that of 31.6% of Choi Y D study, 36% in case of Gledhill A study, 40% in case of Sing A study and 45.3% in Khalid M study.

The sputum cytology was positive for squamous cell carcinoma. This can be explained by the fact that squamous cell carcinomas are usually located centrally and readily exfoliate cells into the sputum[10].

5. Conclusion

Bronchial brushing have better sensitivity than BAL for diagnosis of lung carcinoma. Sputum is less sensitive than bronchial brushing for diagnosis of lung carcinoma. Commonest lung carcinoma in malwa region is Squamous cell carcinoma.Thus to achieve correct and timely diagnosis, combination of investigations including bronchial biopsy, BAL, bronchial brushing and sputum examination should be performed wherever feasible.

6. References

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