

ORIGINAL RESEARCH

Comparative Evaluation of Bronchoalveolar Lavage and Transbronchial Lung Biopsy in Various Lung Pathologies: An Institutional Based Study

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ABSTRACT

Background: Lung pathology is the leading cause of death in developed countries and is increasing at alarming rates in developing countries. Flexible fiberoptic bronchoscope revolutionized respiratory cytology as techniques such as bronchial brushing (BB), bronchoalveolar lavage (BAL), and bronchial biopsy became more easy, accessible, and popular. Fine needle aspiration cytology (FNAC) has proved to be the most helpful method for the diagnosis of lung tumors. The present study was conducted to compare Bronchoalveolar Lavage and Transbronchial Lung Biopsy in Various Lung Pathologies. **Materials & Methods:** This was a retrospective study among patients who were diagnosed to have various lung pathologies. After obtaining well-informed written consent, all the bronchoscopies were performed as an elective procedure. The bronchial biopsies were examined. The tissues were processed as per standard procedure. The analysis of Bronchoalveolar Lavage of all patients were taken and compared with the Transbronchial Lung Biopsy interpretation.

Results: IBAL as pneumonia, 8.8% as lung cancer, 8% as Pulmonary edema, 4.4% as acute respiratory distress syndrome, 17.2% as Tuberculosis, 3.2% as Emphysema, 11.2% as Emphysema, 2.4% as COPD, 2.4% as Bronchitis, 0.8% as Cystic fibrosis, 20% as Asthma, 2.8% as Interstitial lung disease. On biopsy, 31.2% were diagnosed as pneumonia, followed by 23.2% as Tuberculosis, 21.6% as Asthma.

Conclusion: The present study concluded that diagnosis achieved was highest with the bronchoscopic biopsies.

Keywords: Bronchoalveolar Lavage, Transbronchial Lung Biopsy, Lung Pathologies.

INTRODUCTION

For many years, induced sputum (IS) was used for the diagnosis of different respiratory diseases. It is being increasingly used to study the pathophysiology of various lung diseases. It is a safe, noninvasive, repeatable procedure with minimal or no complications.^{1,2} Bronchial lavage was originally developed as therapeutic tool in conditions like pulmonary proteinosis, cystic fibrosis and intractable asthma. It has gradually emerged and has been accepted as a tool for diagnosing lung carcinoma.³ Broncho-alveolar lavage is obtained by introducing a

bronchoscope into lower respiratory tract and specimens obtained by means of suction apparatus after infusing 60 ml of saline and re-aspirating it in a mucous extractor.⁴ BAL is an easily performed and well tolerated procedure that is used in routine assessment of patients for carcinoma lung. It also helps tamponade any bleeding that may have occurred as a result of biopsy.⁵ Since the 1970s, as the evolution of transbronchoscope, Transbronchial Lung Biopsy (TBLB) has been widely used in the pulmonary medicine. Bronchial forceps biopsies can be carried out in two principal settings: biopsy of a visible bronchial lesion and biopsy of more a distal one, not visible endobronchially. Compared with open lung biopsy, TBLB has lower complications. However, in peripheral pulmonary lesions, TBLB has a variable and often trivial diagnostic yield as these lesions are often difficult to ascertain without a guidance material.⁶ The present study was conducted to compare Bronchoalveolar Lavage and Transbronchial Lung Biopsy in Various Lung Pathologies.

MATERIALS & METHODS

This was a retrospective study among patients who were diagnosed to have various lung pathologies. The study was conducted over a period of 12 months. Before the commencement of the study ethical clearance was taken from the ethical committee of the institute and informed consent was taken from the patient after explaining the study. Adults over 18 years without sex specification and Cases diagnosed to have lung pathologies were included in the study. Pediatric patients, Patients with inconclusive diagnosis were excluded from the study. After obtaining well-informed written consent, all the bronchoscopies were performed as an elective procedure. Food and drinks were withheld at least 6 hours prior to bronchoscopy. Pre-bronchoscopy screening was done with history, physical examination, BT, CT, PT, platelet count, fresh X-ray chest PA and lateral views and ECG, sputum smear for AFB. Injection atropine 0.6 mg intramuscularly was given 30 minutes prior to the procedure. Local anaesthesia was achieved by spraying the oropharynx with 4-5 ml of 4% xylocaine. The total dose of xylocaine never exceeded 400 mg. Small amount of additional 2% lignocaine was used during bronchoscopy to suppress coughing. All bronchoscopies were performed by a single operator and were done with the patient lying supine on the operation table with the operator standing at the head end. Trans-nasal passage was used for bronchoscopy. Thorough examination of nasopharynx and larynx was done. Nasal passage functions as a stint for the passage of flexible fiberoptic bronchoscope, permitting leisurely inspection of upper airways and observation of the glottis and trachea under dynamic or static conditions. The brush and biopsy instrument are withdrawn through internal channel. The same fiberoptic bronchoscope – PentaxFB15P – was used throughout the study. The bronchial biopsies were examined. The tissues were processed as per standard procedure. 4-5m thick sections were cut on microtome and stained by hematoxylin and eosin stain. The stained slides were studied in detail microscopically; special stains like Periodic acid Schiff's were used where needed. The analysis of Bronchoalveolar Lavage of all patients were taken and compared with the Transbronchial Lung Biopsy interpretation.

RESULTS

In the present study 250 BAL and biopsy were conducted. The study included only those cases where both BAL and bronchial biopsy was done simultaneously. In the present study 21.2% were diagnosed by BAL as pneumonia, 8.8% as lung cancer, 8% as Pulmonary edema, 4.4% as acute respiratory distress syndrome, 17.2% as Tuberculosis, 3.2% as Emphysema, 11.2% as Emphysema, 2.4% as COPD, 2.4% as Bronchitis, 0.8% as Cystic fibrosis, 20% as Asthma, 2.8% as Interstitial lung disease. On biopsy, 31.2% were diagnosed as pneumonia, followed by 23.2% as Tuberculosis, 21.6% as Asthma.

Table 1: Distribution according to Bronchoalveolar Lavage

Lung pathologies	N(%)
Pneumonia	53(21.2%)
Lung cancer	22(8.8%)
Pulmonary edema	20(8%)
Acute respiratory distress syndrome	11(4.4%)
Tuberculosis	43(17.2%)
Emphysema	8(3.2%)
COPD	28(11.2%)
Bronchitis	6(2.4%)
Cystic fibrosis	2(0.8%)
Asthma	50(20%)
Interstitial lung disease	7(2.8%)
Total	250(100%)

Table 2: Correlation of BAL with biopsy

Lung pathologies	According to BAL N(%)	According to Biopsy N(%)
Pneumonia	53(21.2%)	78(31.2%)
Lung cancer	22(8.8%)	13(5.2%)
Pulmonary edema	20(8%)	14(5.6%)
Acute respiratory distress syndrome	11(4.4%)	(%)
Tuberculosis	43(17.2%)	58(23.2%)
Emphysema	8(3.2%)	4(1.6%)
COPD	28(11.2%)	23(9.2%)
Bronchitis	6(2.4%)	3(1.2%)
Cystic fibrosis	2(0.8%)	2(0.8%)
Asthma	50(20%)	54(21.6%)
Interstitial lung disease	7(2.8%)	3(1.2%)
Total	250(100%)	250(100%)

DISCUSSION

For evaluation of patients, the first step is clinical assessment followed by investigations such as pulmonary function tests and thoracic imaging (radiographs and High Resolution Computed Tomographies (HRCTs)); subsequently, direct invasive methods such as BAL and lung biopsies – either transbronchial biopsy or open surgical lung biopsy – are usually needed to confirm the diagnosis.⁷

It is well known that BAL is a minimally invasive technique, with infrequent complications, but it is not easy to get patient acceptance to the procedure. Moreover, BAL is not recommended for screening, or to evaluate exposures and follow-up, and is contraindicated in some patients.^{8,9}

In the present study 21.2% were diagnosed by BAL as pneumonia, 8.8% as lung cancer, 8% as Pulmonary edema, 4.4% as Acute respiratory distress syndrome, 17.2% as Tuberculosis, 3.2% as Emphysema, 11.2% as Emphysema, 2.4% as COPD, 2.4% as Bronchitis, 0.8% as Cystic fibrosis, 20% as Asthma, 2.8% as Interstitial lung disease. On biopsy, 31.2% were diagnosed as pneumonia, followed by 23.2% as Tuberculosis, 21.6% as Asthma.

In a study by Richa Sharma, it is found that broncho-alveolar lavage is a good screening procedure for diagnosing malignant cells in lung.¹⁰

A study conducted by Dinesh R et al showed that bronchoscopic bronchoalveolar lavage was positive in 30% cases, bronchial brush was positive in 88% of cases and bronchial biopsy was positive in 925 cases.¹¹

Wongsurakiat et al. (1998), retrieved malignant cells in 47% of patients with peripheral lung carcinoma, whereas transbronchial biopsy was diagnostic in only 17%.¹²

Schwarz revealed that bronchial brushings, BAL analysis, or bronchoscopic lung biopsies showed either or both positive cytology and histopathology when lymphangitic carcinomatosis was present.¹³

Bhat N et al compared bronchial biopsy and bronchoalveolar lavage (BAL) cytology and in the diagnosis of carcinoma lung. Out of a total of 902 clinically suspected cases of lung cancer tumor was found in 760 cases (84.25%) by biopsy and in 301 cases (33.37%) by BAL. The total number of false positive cases was 31 and false negative cases were 490. Sensitivity of BAL was found to be 35.5% and specificity 78.16%.¹⁴

CONCLUSION

The present study concluded that diagnosis achieved was highest with the bronchoscopic biopsies.

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