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Original Research

Comparative evaluation of results of bronchoalveolar lavage and transbronchial lung biopsy

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ABSTRACT

Background: The present study was undertaken for comparing the results of bronchoalveolar lavage and transbronchial lung biopsy. **Materials & methods:** A total of 50 specimens of bronchoalveolar lavage submitted for cytological examination and all the specimens of transbronchial lung biopsy submitted for histopathological examination were included in the study. The BAL fluid was collected in containers that didn't promoted cell adherence to container surfaces. Transbronchial specimens received were fixed in 10% buffered formalin. After fixation the specimen were subjected to gross examination for size and external appearance. Multiple pieces taken and they were processed. H and E staining of the sections were done. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. **Results:** Sensitivity and specificity of BAL for assessing malignant lesions was 70.5 percent and 86.8 percent respectively. Sensitivity and specificity of BAL for assessing non-malignant lesions was 82.3 percent and 73.5 percent respectively. **Conclusion:** From the above results, the authors conclude that the combination of these two methods gives not only a quantitative, but also a qualitative increase in the diagnostic yield of bronchoscopy.

Key words: Bronchoalveolar lavage, Transbronchial lung biopsy

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Introduction

Anatomically, the lung is described by an apex, three borders, and three surfaces. The apex lies above the surfaces. The three borders include the anterior, posterior and inferior borders. A delay in establishing a definitive diagnosis has been shown to be a negative prognostic factor in immunocompromised patients. To establish an earlier, more definitive diagnosis, bronchoalveolar lavage (BAL) is regarded as an initial diagnostic tool in pediatric immunocompromised patients with pulmonary dysfunction. In the absence of definitive findings from BAL, many patients continue to receive empiric antimicrobial treatments that can have deleterious toxicities, including but not limited to ototoxicity, renal insufficiency, and hepatotoxicity. Lung biopsy (LB) can have an increased diagnostic yield, given its ability to detect infectious and noninfectious etiologies.[1- 4] Hence; under the light of above mentioned data, the present study was undertaken for comparing the results of bronchoalveolar lavage and transbronchial lung biopsy.

Materials & methods

The present study was undertaken for comparing the results of bronchoalveolar lavage and transbronchial lung biopsy. A total of 50 specimens of bronchoalveolar lavage submitted for cytological examination and all the specimens of transbronchial lung biopsy submitted for histopathological examination were included in the study. The BAL fluid was collected in containers that didn't promoted cell adherence to container surfaces. Transbronchial specimens received were fixed in 10% buffered formalin. After fixation the specimen were subjected to gross examination for size and external appearance. Multiple pieces taken and they were processed. H and E staining of the sections were done. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software.

Results

Mean age of the patients was 52.3 years. 56 percent of the patients were males. Adenocarcinoma was the diagnosis in 15 patients while squamous cell carcinoma was the diagnosis in 20 patients. Tuberculosis was the non-malignant diagnosis in 12 patients. Sensitivity and specificity of BAL for assessing malignant lesions was 70.5 percent and 86.8 percent respectively. Sensitivity and specificity of BAL for assessing non-malignant lesions was 82.3 percent and 73.5 percent respectively.

Table 1: Demographic data

Variable	Number of patients	Percentage of patients
Mean age (years)	52.3	
Males	28	56
Females	22	44

Table 2: Histopathologic diagnosis on Transbronchial lung biopsy

Histopathologic diagnosis		Number of patients
Malignant	Adenocarcinoma	15
	SCC	20
	Total	35
Non-malignant	Tuberculosis	12
	Fungal infection: Candida	3
	Total	15
Grand Total		50

Table 3: Accuracy of BAL in relation to malignancy pathologies and non-malignant pathologies

Pathology		Value
Malignant	Sensitivity	70.5%
	Specificity	86.8%
Non-malignant	Sensitivity	82.3%
	Specificity	73.5%

Discussion

Bronchoalveolar lavage (BAL) is a saline wash of the bronchial tree introduced in 1970. It is an investigative technique. It became a diagnostic tool in India in 1994. The number of studies on BAL in Indian literature is few. We take this opportunity to highlight the utility of BAL material in making a definite diagnosis. Its advantages outweigh its limitations. BAL material has a very important role in diagnosis of infections and malignancies. It is a relatively safe procedure and is well tolerated. With the number of conditions that can be diagnosed, we strongly suggest that BAL should be used as a diagnostic tool and just not an investigating procedure. BAL provides material for various microbiological tests. One major limitation of BAL is a large range of normal values.[5- 10]

Mean age of the patients was 52.3 years. 56 percent of the patients were males. Adenocarcinoma was the diagnosis in 15 patients while squamous cell carcinoma was the diagnosis in 20 patients. Tuberculosis was the non-malignant diagnosis in 12 patients. Clark BD et al searched records for single pulmonary disease events with closely timed BAL and LFNA, as defined by both procedures occurring within <8 days of each other. No samples with "unsatisfactory" diagnoses were considered for the analyses. Success of identifying malignancy and/or an infectious agent was recorded for both procedures. 52 episodes of closely timed (65% within 3 d) BAL and LFNA procedures were identified in 45 patients for a single disease event. The clinical scenarios as per the sample requisitions were as follows: consolidation/infiltrate (60%), mass/nodule (23%), cavitary lesion (5.7%), pneumonia (5.7%), or not specified (5.7%). For all cases examined, in 18 (35%) of the episodes, LFNA uniquely identified either malignancy, 6/18 (12%), or infectious agents such as Aspergillus and acid-fast bacteria, 12/18 (23%), with a corresponding nondiagnostic BAL. In one episode with a clinical diagnosis of infiltrates, the BAL was positive for acid-fast bacteria, whereas the LFNA was negative. Chi-square analysis of the data revealed statistical significance indicating LFNA to be a superior method for the diagnosis of pulmonary pathology over BAL.[10]

In the present study, sensitivity and specificity of BAL for assessing malignant lesions was 70.5 percent and 86.8 percent respectively. Sensitivity and specificity of BAL for assessing non-malignant lesions was 82.3 percent and 73.5 percent respectively. Bulpa PA et al evaluated the safety and diagnostic yield of bedside bronchoalveolar lavage (BAL) combined with fibrescopic transbronchial lung biopsy (TBLB) in determining the aetiology of pulmonary infiltrates in mechanically ventilated patients. The records of 38 mechanically ventilated patients who underwent BAL/TBLB to investigate unexplained pulmonary infiltrates were retrospectively reviewed. Patients were divided into two groups: immunocompetent (group 1: n=22; group 1a: n=11, late acute respiratory distress syndrome (ARDS); group 1b: n=11, no ARDS) and immunocompromised (group 2, n=16). The procedure allowed a diagnosis in 28 patients (74%), inducing therapeutic modification in 24 (63%) and confirmation of clinical diagnosis in four (11%). In groups 1a, 1b and 2, diagnosis was obtained in 11 out of 11 (fibroproliferation), seven out of 11 and 10 out of 16 patients, and therapy changed in 11 out of 11 (administration of steroids), six out of 11 and seven out of 16 patients, respectively. Pneumothorax occurred in nine patients (four of group 1a), bleeding in four (v35 mL), and transient hypotension in two. No fatalities were procedure-related. Combined bronchoalveolar lavage/transbronchial lung biopsy is of diagnostic and therapeutic value in mechanically

ventilated patients with unexplained pulmonary infiltrates, excluding those with late acute respiratory distress syndrome. Although complications are to be expected, the benefits of the procedure appeared to exceed the risks in patients in whom a histological diagnosis was deemed necessary.[11]

Conclusion

From the above results, the authors conclude that the combination of these two methods gives not only a quantitative, but also a qualitative increase in the diagnostic yield of bronchoscopy.

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