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Original Research

Comparison of results of bronchoalveolar lavage and transbronchial lung biopsy

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ABSTRACT:
Background: Developing countries have to bear burden of both communicable and noncommunicable diseases simultaneously. Bronchoalveolar lavage (BAL) is a saline wash of the bronchial tree introduced in 1970. It is an investigative technique. Transbronchial lung biopsy (TBLB) via flexible bronchoscopy is commonly used to diagnose a wide range of pulmonary diseases. 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:** All the 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. All the specimens of bronchoalveolar lavage and transbronchial lung biopsy (obtained via rigid or flexible bronchoscopy) received in the department of Pathology were enrolled. 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 of BAL for diagnosing malignant and non-malignant lesions was 68.6% and 84.3% respectively. **Conclusion:** 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

Developing countries have to bear burden of both communicable and noncommunicable diseases simultaneously. The recent Global Burden of Disease (GBD) survey data have shown that pulmonary diseases are prevalent in substantial number in India. Chronic pulmonary pathologies are of particular importance for having wide variations in morbidity and mortality in various Indian states.[1, 2]

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. 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.[3, 4] Obtaining adequate tissue specimens for pathologic diagnosis when the patients do not undergo surgery is an important step in the diagnostic work up of pulmonary diseases. Transbronchial lung biopsy (TBLB) via flexible bronchoscopy is commonly used to diagnose a wide range of pulmonary diseases.[5, 6] 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

All the 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 relevant data of patient was recorded in pre designed performa. All the specimens of bronchoalveolar lavage and transbronchial lung biopsy (obtained via rigid or flexible bronchoscopy) received in the department of Pathology were enrolled. The BAL fluid was collected in containers that didn't promoted cell adherence to container surfaces (e.g., silicone- coated glass or polypropylene or other plastics that are designed for suspension tissue culture). 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 56.1 years. 60 percent of the patients belonged to the age group of 41 to 60 years. 52 percent of the patients were males. On Transbronchial lung biopsy assessment, malignant lesions were seen in 60 percent of the patients while non-malignant lesions were seen in 40 percent of the patients. Sensitivity of BAL for diagnosing malignant and non-malignant lesions was 68.6% and 84.3% respectively.

Table 1: Age-wise distribution of patients

Age group (years)	Number of patients	Percentage of patients
Less than 40	5	20
41 to 60	15	60
More than 60	5	20
Total	25	100
Mean	56.1 years	

Table 2: Gender-wise distribution of patients

Gender	Number of patients	Percentage of patients
Males	13	52
Females	12	48
Total	25	100

Table 3: Histopathologic diagnosis on Transbronchial lung biopsy

Histopathologic diagnosis		Number of patients	Percentage of patients
Malignant	Adenocarcinoma	7	28
	SCC	7	28
	Small cell Carcinoma	1	4
	Total	15	60
Non-malignant	Tuberculosis	7	28
	Fungal infection: Aspergillosis	1	4
	Fungal infection: Candida	2	8
	Total	10	40
Grand Total		25	100

Table 4: Accuracy of BAL in relation to malignancy pathologies and non-malignant pathologies

Pathology		Value
Malignant	Sensitivity	68.6%
	Specificity	84.3%
Non-malignant	Sensitivity	84.3%
	Specificity	68.6%

DISCUSSION

A significant portion of pathological disease within the lungs occurs at the alveolar level. BAL allows for the collection of the alveolar milieu and further analysis of its composition. Common scenarios for the use of BAL include work up for opportunistic and atypical respiratory infections in immunocompromised patients, unexplained radiographic pulmonary infiltrates or hypoxemia. BAL can also provide clues to support the diagnosis of some noninfectious conditions such as Diffuse Alveolar Hemorrhage (DAH), Pulmonary Alveolar Proteinosis (PAP), Eosinophilic Pneumonia, Hypersensitivity Pneumonitis (HP), Interstitial Lung Diseases (ILDs), chronic berylliosis, the presence of malignant cells and Asbestos exposure.[6- 9] Hence; under the light of above mentioned data, the present study was undertaken for comparing the results of bronchoalveolar lavage and transbronchial lung biopsy.

In the present study, mean age of the patients was 56.1 years. 60 percent of the patients belonged to the age group of 41 to 60 years. 52 percent of the patients were males. Iftikhar IM et al in 2017 studied the diagnostic accuracy and safety profile of transbronchial lung cryobiopsy and compare with video-assisted thoracoscopic surgery (VATS) by reviewing available evidence from the literature. Medline and PubMed were searched from inception until December 2016. Data on diagnostic performance were abstracted by constructing two-by-two contingency tables for each study. The pooled diagnostic yield, pooled sensitivity, and pooled specificity of transbronchial lung cryobiopsy were 83.7% (76.9-88.8%), 87% (85-89%), and 57% (40-73%), respectively. The pooled diagnostic yield, pooled sensitivity, and pooled specificity of VATS were 92.7% (87.6-95.8%), 91.0% (89-92%), and 58% (31-81%), respectively. The incidence of grade 2 (moderate to severe) endobronchial bleeding after transbronchial lung cryobiopsy and of post-procedural pneumothorax was 4.9% (2.2-10.7%) and 9.5% (5.9-14.9%), respectively.[10]

In the present study, on Transbronchial lung biopsy assessment, malignant lesions were seen in 60 percent of the patients while non-malignant lesions were seen in 40 percent of the patients. Traci NA et al in 2018 determined the diagnostic utility of the combination of BAL lymphocyte count and TBBX in patients with Hypersensitivity Pneumonitis (HP). they were conducted a study on all patients with a MDD diagnosis of HP at a single center and they were included 155 patients in the study and founded that the 49% of patients who underwent BAL had a lymphocyte count > 20, 42% had a lymphocyte count > 30, and 34% had lymphocyte count > 40%. The median BAL lymphocyte count was higher in inflammatory HP compared to fibrotic HP. The addition of TBBX to BAL significantly increased the diagnostic yield regardless of the BAL lymphocyte cutoff used. The yield of bronchoscopy with TBBX and BAL when a lymphocyte count > 40% was used as a cutoff was 52%. They suggested that the combination of TBBX with BAL significantly increases the likelihood that the procedure will provide adequate additional information to allow a confident MDD diagnosis of HP and may reduce the need for SLB in the diagnostic workup of HP.[11]

In the present study, Sensitivity of BAL for diagnosing malignant and non-malignant lesions was 68.6% and 84.3% respectively. Cadranel J et al in 2020 were assessed the diagnostic value of site-directed bronchoalveolar lavage (BAL) and combined transbronchial biopsy (TBB) in 29 HIV-infected patients with localized pneumonia, in whom a previous BAL was nondiagnostic and in whom improvement did not occur with empiric antibiotic therapy. All patients but three had a CD4 cell count < 100/microliters. A definite diagnosis could be reached in 26 of 29 (90%) individuals, including 24 pathogens. Neither the radiologic pattern nor the type of Pneumocystis carinii (PC) prophylaxis could predict the positivity of either one of these two diagnostic procedures. Site-directed BAL alone allowed a diagnosis in infection in eight (28%) cases. TBB alone led to diagnosis in eight (28%) cases, including three PC and two toxoplasma gondii, undiagnosed by the site-directed BAL. Both techniques were positive and in agreement in 10 (34%) cases. The majority of the diagnosis led to a specific treatment. Therefore, the patients' survival was positively altered by the procedure and they were concluded that the performance of site-directed BAL and combined TBB markedly optimizes the diagnostic yield of each of these procedures performed separately in HIV-infected patients with localized pneumonia.[12]

CONCLUSION

The combination of these two methods gives not only a quantitative, but also a qualitative increase in the diagnostic yield of bronchoscopy. The number of lesions with a definite diagnosis outnumber the lesions that cannot be diagnosed hence we opine that BAL is a useful diagnostic modality not only for routine diagnosis, but also for ancillary techniques and research purpose.

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