



## ROLE OF BRONCHOALVEOLAR LAVAGE IN THE DIAGNOSIS OF BACTERIAL PNEUMONIA

### Medicine

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### ABSTRACT

**Background:** Tuberculosis and Pneumonia is very common in India but due to lack of infrastructure and knowledge, many patients did not diagnosed properly so morbidity and mortality increased. Bronchoscopy is a good diagnostic tool for undiagnosed pneumonia and other lung condition. **Methods:** Total 41 patients were enrolled after taking their informed consent. Those patients' sputum reports negative for culture and AFB stain were involved in this study. Immunocompromised and patients on antibiotics were not involved in our study. **Results:** In our study total 41 patients were enrolled out of them 27 were male and 14 were female. Most of our patients from the age group of 51-60 years. In our study most common presenting symptom was cough in 38 patients and followed by fever in 26 patients. In our study diagnostic yield of Bronchoscopy is 46.34%. **Conclusion:** This study has shown that males are more prone to get infected and develop pneumonia compared to females. Older age group is more susceptible for developing pneumonia with underlying co-morbidities like diabetes. Most common presenting symptoms were cough, fever, sputum production, breathlessness with most common zone involvement in right upper zone. This study showed a significantly higher yield than sputum. Because of this, BAL has been considered to be the best biological sample for identifying a bacterial agent for years. This data show that BAL fluid is more valuable in diagnosing and for deciding further management according to organisms isolated. BAL has better role in bacterial pneumonia than sputum analysis, but it is not gold standard tool having low sensitivity.

### KEYWORDS

Bronchoscopy, BronchoAlveolar Lavage, Pneumonia

#### INTRODUCTION:

Bronchoalveolar Lavage or BAL is a small invasive procedure that involves instillation of normal saline into the lung and followed by suction and collection of the lavage for analysis. This procedure is done by the introduction of a flexible bronchoscope into a sub-segment of the lung. The procedure was popularized in 1974 by the work of American physicians, Reynolds and Newball, in Maryland. Today, it serves predominantly as a diagnostic as well as therapeutic tool for the evaluation of lower respiratory tract pathology and in some uncommon conditions.<sup>[1][2]</sup>

#### AIMS AND OBJECTIVES:

- To determine the yield of qualitative Bronchoalveolar Lavage (BAL) bacterial culture in patients with pneumonia.
- To know the diagnostic accuracy of Bronchoalveolar Lavage (BAL) in Pneumonia cases.
- To know the antibiotic sensitivity pattern of pneumonia causing bacteria detected in Bronchoalveolar Lavage (BAL).

#### MATERIALS AND METHODS:

Our study was prospective study carried out at Department of Respiratory Medicine, Medical College Baroda and SSG hospital Vadodara after taking permission from Institutional Ethical Committee.

In our study total 41 adult (>18 years) patients were enrolled after taking informed consent. All enrolled patients had a sign and symptom of pneumonia but not diagnosed on sputum examination, all patients had a negative sputum culture report and sputum negative for AFB stain so further diagnosis we done bronchoscopy.

Patient on long term antibiotic therapy and immunocompromised not involved in our study.

#### RESULTS:

In our study total 41 patients were enrolled out of them 27 patients were male and 14 patients were female (Table 1). Most of our patients from the age group of 51-60 years.

In our study most common presenting symptom was cough in 38 patients (93%) followed by fever in 26 patients (63%) (Table 2). In our study most common co morbidity was diabetes mellitus in 7 patients (17%) followed by Chronic Obstructive Pulmonary disease in 4

patients (10%). Right upper zone involvement in chest x ray was observed in 16 patients (39%) (Table 3).

In our study out of 41 patients 19 patients' BAL fluid was positive for pathogens. Out of these 19 cases, most common organism causing pneumonia was Pseudomonas in 8 patients (19.51%) followed by Mycobacterium Tuberculosis in 4 patients (9.76%). So in our study overall diagnostic yield of bronchoscopy is 46.34%.

**Table 1: Distribution Of Patients By Gender:**

| Gender | No. of Cases | Percentage (%) |
|--------|--------------|----------------|
| Male   | 27           | 66             |
| Female | 14           | 34             |
| Total  | 41           | 100            |

**Table 2: Distribution Of Patients By Presenting Complaint:**

| Chief Complain    | Yes | %  | No | %  |
|-------------------|-----|----|----|----|
| Cough             | 38  | 93 | 3  | 7  |
| Breathlessness    | 18  | 44 | 23 | 56 |
| Chest Pain        | 11  | 27 | 30 | 73 |
| Hemoptysis        | 2   | 5  | 39 | 98 |
| Fever             | 26  | 63 | 15 | 37 |
| Sputum Production | 21  | 51 | 20 | 49 |
| Anorexia          | 11  | 27 | 30 | 73 |
| Sore Throat       | 4   | 10 | 37 | 90 |
| Weight Loss       | 10  | 24 | 31 | 76 |

**Table 3: Distribution Of Patients By Chest X-Ray Lesions:**

| Zone on Chest X-ray | Unilateral |          | Bilateral |
|---------------------|------------|----------|-----------|
|                     | Right      | Left     |           |
| Upper Zone          | 16 (39%)   | 3 (7%)   | 4 (10%)   |
| Middle Zone         | 13 (32%)   | 11 (27%) | 3 (7%)    |
| Lower Zone          | 6 (15%)    | 2 (5%)   | 0 (0%)    |

#### DISCUSSION:

In our study mean age of patients is 49 years while Chaudhari<sup>[3]</sup> included mean age of 51.33 years. In our study male to female ratio was 1.92:1 while in Chaudhari<sup>[3]</sup> study male to female ratio was 2.16:1. In our study right upper zone involvement was most common in 23 cases (56%) while in Chaudhari<sup>[3]</sup> right upper zone involvement was also most common in 24 cases (40%).

In our study overall diagnostic yield of BAL is 46.34% while in

Chaudhari<sup>[3]</sup> study overall diagnostic yield of BAL was 55.3 %. In Kalawat study overall diagnostic yield of BAL was 64.70%.

### CONCLUSION:

This study has shown that males are more prone to get infected and develop pneumonia compared to females. Older age group is more susceptible for developing pneumonia with underlying co-morbidities like diabetes. Most common presenting symptoms were cough, fever, sputum production, breathlessness with most common zone involvement in right upper zone.

This study showed a significantly higher yield than sputum. Because of this, BAL has been considered to be the best biological sample for identifying a bacterial agent for years. This data show that BAL fluid is more valuable in diagnosing and for deciding further management according to organisms isolated. BAL has better role in bacterial pneumonia than sputum analysis, but it is not gold standard tool having low sensitivity.

### REFERENCES

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