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Microbiological Analysis of Bronchoalveolar Lavage Fluid of Patients Undergoing Bronchoscopy at Two Tertiary Care Hospitals in Colombo

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Background: Microbiological analysis of Bronchoalveolar lavage (BAL) fluid gives valuable information on pathogens responsible for associated diseases. This study was conducted to detect a broad group of microorganisms from BAL of patients with different pathologies and to identify possible associated factors for microbial infection/colonization of lower airways.

Objectives: To describe bacterial and fungal pathogens isolated from BAL to determine the association of selected factors with lower airway infection/colonization of patients undergoing bronchoscopy in two tertiary care hospitals in Colombo

Methods: A descriptive cross-sectional study was conducted during a two-month period including consecutive patients undergoing bronchoscopy. BAL fluid was subjected to microbiological examination. Association of microbiological findings with selected factors was determined.

Results: A total of 34 patients with chronic lung disease (9), lung malignancy (14) and ongoing infections (12) were included. Among 34 BAL samples, 25 (73.5%) samples yielded a possible/probable pathogen. Aerobic culture yielded bacterial pathogens in 17 (50%) samples. All were Gram-negative bacteria; *Pseudomonas* spp. and *Klebsiell*a spp. 8 (44.5%) isolates each and 2 (11%) *Morexella catarrhalis* isolates. Antibiotic resistance was relatively low in these organisms. Fourteen (41.2%) samples were positive for a fungal growth and the commonest fungal pathogens were *Aspergillus* spp. (3/14) and *Gliocladium* spp. (3/14). One Gram-negative anaerobic bacillus was isolated and one sample was positive for Ziehl-Neelsen stain. All the patients (100%) with chronic lung disease were infected or colonized with possible/probable pathogens. Most commonly isolated probable pathogen was *Pseudomonas* spp. (88.8%) among patients with chronic lung disease. Half (50%) of diabetic patients and 55.5% of smokers were infected or colonized with possible/probable pathogens.

Conclusions: A high number (73.5%) of BAL revealed growth of possible/probable pathogens indicating a considerable lower airway colonization/infection rate in this population. Employing several microbial detection methods enables the recognition of true colonization/infection rate with microorganisms. The bacteria isolated showed a relatively low antibiotic resistance. Chronic lung disease is a risk factor for lower airway colonization/infection.

Keywords: *Bronchoalveolar lavage, Lower airway colonization, Lung pathology, Microbiological analysis*