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**Paper Poster Session
Microbiota**

The contribution of bronchoalveolar lavage (BAL) in the differential diagnosis of pulmonary infections

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Background: Bronchoalveolar lavage (BAL) samples collected via fiberoptic bronchoscopy (FOB) provide important information in the differential diagnosis of pulmonary infections. This technique is especially important in diagnosis and management of immunocompromised patients with diffuse pulmonary infiltrates. In this study, we investigated the contribution of BAL in the differential diagnosis of patients with pulmonary infiltrates suspicious for infections.

Material/methods: The study included 166 patients suspected for pulmonary infections who underwent FOB during a study period of two years (June 2013-June 2015). BAL was collected from the lobe with the most prominent infiltration. The patient files were reviewed retrospectively and the demographic data, symptoms, comorbidities, thoracic computed tomography (CT) findings, BAL results, treatments and outcomes were recorded.

Results: There were 166 patients (112 male, 54 female) with a mean age of 56 years. The most common presenting symptoms were dyspnea (n=52, 31%), cough (n=48, 29 %) and fever (n=28, 17%). The percentage of patients with immunosuppression was 61.4% (n=102) (solid organ tumors: 30, hematological malignancy: 16, treatment with immunosuppressive drugs/ biological agents: 18, transplant receivers: 6, diabetes mellitus: 23, renal insufficiency: 10, other: 10). Thoracic CT findings were bilateral infiltrations in 100, nodular lesions in 81, ground glass opacities in 46, cavitary lesions in 35, and consolidations in 32 patients. The BAL fluid revealed a positive culture for aerobic bacteria in 34, *Mycobacterium tuberculosis* in 7 and fungi in 26 patients whose treatment was adjusted accordingly. There were 6 immunocompromised patients who were treated with antifungal treatment based on a result of a high galactomannan level in BAL. Three of these patients also had a positive culture result for *Aspergillus* species. There were 6 patients with high *Cytomegalovirus* (CMV) viral load level in BAL and all of them were given antiviral treatment. There was no patient with a positive result for *Pneumocystis jiroveci*. While the diagnostic yield of BAL was 40% in immunocompromised patients, it was 20% in non-immunocompromised patients.

Conclusions: The analysis of BAL fluid is important in the differential diagnosis of pulmonary infections. It is found to be more important especially in immunocompromised patients. In this group of patients, the diagnostic yield can be improved by the determination of galactomannan and CMV viral load levels in addition to routine aerobic, tuberculosis and fungal cultures.