Introduction:
Bronchoalveolar lavage (BAL) is a useful tool for diagnosing diffuse pulmonary diseases. However, the utility of BAL for acute respiratory failure in the intensive care unit (ICU) setting have not been well investigated.

Methods:
We retrospectively collected consecutive 91 patients who were diagnosed as having acute respiratory failure with diffuse pulmonary involvements in an emergency and critical care unit of a University-affiliated Hospital from 2010 to 2017. We investigated the correlations between BAL analysis, clinical diagnosis and prognosis in these patients.

Results:
There were 63 males and 28 females (median age, 68 years [IQR 60-75]; PaO$_2$/FIO$_2$(P/F) ratio, 124 [IQR 75-176]. All patients were diagnosed as having acute respiratory distress syndrome (ARDS) based on the radiological and laboratory findings. The major findings of BAL included alveolar hemorrhage (n=34), neutrophilia (n=84), lymphocytosis (n=13), increased total cell counts (n=49) and positive polymerase chain reaction of Pneumocystis jirovecii DNA (n=7). Diagnoses considering the BAL results included bacterial pneumonia (n=10), viral pneumonia (n=5), fungal pneumonia (n=1), acute exacerbations of interstitial pneumonia (n=29), diffuse alveolar hemorrhage (n=34) and pneumocystis pneumonia (n=10). No significant differences were found in the P/F ratio between before and after the procedure of BAL (172 vs. 174, p=0.33). In the receiver operating characteristic (ROC) curve analysis, low lymphocyte fraction in BAL was poor prognostic factor (AUC, 0.81; 95%CI, 0.71-0.91). In the multivariate analysis, low lymphocyte fraction in BAL was the independent poor prognostic factor (p=0.0004; hazard ratio, 0.92; 95%CI, 0.88-0.99) after adjustment by age, sex, APACHE II score and SOFA score.

Conclusion:
BAL provided additional information for the clinically-diagnosed ARDS patients. Lymphocyte fraction in BAL sample could be a useful prognostic factor.