Fibrocytes In Bronchoalveolar Lavage Fluid Are Associated With Outcome In Patients With Acute Lung Injury

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Background: Fibrocytes are mesenchymal progenitors from hematopoïetic origin involved in normal and pathologic organ repair. During acute lung injury (ALI) and acute respiratory distress syndrome (ARDS), an ineffective repair is associated with over-mortality. We investigated whether fibrocyte detection in bronchoalveolar lavage fluid (BAL) could be a predictor of outcome during acute lung injury.
Methods: We prospectively collected BAL from 122 ventilated patients (62-ARDS, 30-ALI, 30-ventilated patients w/o ALI/ARDS). Fibrocytes, defined as cells expressing CD45 and collagen 1, were quantified by flow cytometry. Chemokines, growth factors and collagen 1 concentrations were measured in BAL supernatants. Ventilated patients were followed up for 28 days after BAL procedure and clinical data recorded.
Findings: Fibrocytes were detected in 89% of BAL from ventilated patients. The median percentage of BAL fibrocytes was significantly increased in patients with ALI and ARDS (5.0 %) in comparison with ventilated controls (0.9%, p<0.0001). Fibrocyte percentage correlated with percentage of monocytes/macrophages in BAL (s=0.35, p=0.007). After adjustment for age, comorbidities, administered treatments and severity of illness in a multivariable COX proportional-hazard model, a percentage of BAL fibrocytes over 6% was independently associated with a lower proportion of patients weaned from mechanical ventilation at 28 days (HR [95% CI]= 0,34 [0,15-0,78], p=0,01) and a higher 28-day mortality in ALI/ARDS patients (HR [95% CI]= 6.15 [2.78-13.64], p<0.0001).
Interpretation: Fibrocytes are detectable in the alveolar space during ALI/ARDS. BAL Fibrocytes percentage is an independent marker associated with poor survival and requirement for prolonged mechanical ventilation in patients with ALI/ARDS.

This abstract is funded by: This work was supported by the European Commission (FP 7, European IPF Network), by the Agence Nationale de la Recherche (ANR Physio 2006, FIBROPNEUMO), and in part by grants from CIRC AP-HP CRC05105 (BC, MD, CQ) and from the "Société de Réanimation de La