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Title: Local and systemic neutrophilic inflammation in patients with lung cancer and chronic obstructive pulmonary disease

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Body: Background: Neutrophils play an important role in lung cancer (LC) as well as chronic obstructive pulmonary disease (COPD) immune response. The aim of this study was to evaluate the neutrophils and neutrophil to lymphocyte (N/L) ratio in LC and COPD and in coexistence in these two diseases. Methods: We enrolled 39 patients with LC, 30 patients with LC/COPD, 32 patients with COPD, and 28 healthy subjects (HI). Peripheral blood and BALF were obtained for cell count analysis before any treatment. Results: Neutrophils and N/L ratio were higher in LC and LC/COPD compared with COPD or HI (P<0.05).

Peripheral blood cells, mean±SEM

| Variables | LC | LC/COPD | COPD | HI |
|---------------------------|--------------------|--------------------|------------------|-----------------|
| Neutrophils, % | 65.34±0.85*§ | 67.45±1.43*§ | 61.77±1.18* | 56.92±1.65 |
| Neutrophils, x109l | 5.72±0.22*§ | 5.96±0.39*§ | 4.35±0.22* | 3.70±0.25 |
| Lymphocytes, % | 23.01±0.79*§ | 21.11±1.21*§ | 25.93±0.99* | 31.64±1.45 |
| Lymphocytes, x109l | 1.88±0.06 | 1.84±0.10 | 1.78±0.09 | 1.99±0.09 |
| N/L ratio, median (range) | 2.92(0.93-13.42)*§ | 3.08(1.18-8.84)* § | 2.35(1.13-4.25)§ | 1.86(1.16-3.21) |

*P<0.05 vs HI; §P<0.05 vs COPD.

Neutrophils in BALF were higher in LC and LC/COPD compared with HI but lower than COPD (P<0.05).

BAL fluid cells, mean±SEM

| Variables | LC | LC/COPD | COPD | HI |
|----------------------|-------------|-------------|-------------|-----------|
| Neutrophils, % | 8.01±1.37*§ | 7.94±0.83*§ | 14.10±2.96* | 1.29±0.21 |
| Neutrophils, x106/ml | 0.39±0.12* | 0.51±0.15* | 0.54±0.22* | 0.08±0.05 |

*P<0.05 vs HI; §P<0.05 vs COPD.

LC patients were treated with platinum based chemotherapy. The median PFS in the N/L ratio lower group was 6.07 months (2.87 to 10.43) and in the N/L ratio higher group was 5.4 months (3.63 to 7.17)(P<0.05).

Conclusions:Our data suggest a higher degree of systemic, but not local, neutrophilic inflammation in patients with LC (with or without COPD) than in patients with COPD.