Lung T cells in the lung are discussed. We wish to thank Drs. G. Marcer, A. Cipriani for allowing to study their patients.

References

Evidence in bronchoalveolar lavage for third type immune reactions in hypersensitivity pneumonitis

A. Pesci, G. Bartorelli*, P.P. Dall'Aglio, G.P. Neri, D. Olivieri

Immune complex disease and immune cellular mechanisms are thought to participate in the pathogenesis of hypersensitivity pneumonitis (HP). Data obtained from bronchoalveolar lavage (BAL) in patients with hypersensitivity pneumonitis (HP) were studied. Forty two patients with HP (32 men, 48.9±9.9 yrs) were studied. Only two were smokers; none had previously been treated; all had recently been exposed to the antigen (mean time lapse from last exposure: 15 days). Controls were 7 healthy nonsmoking volunteers.

B. Lavage was based on standard criteria: 1) history of exposure to HP antigens; 2) symptomatic acute episode with chills, fever, cough and breathlessness 4–8 h after exposure; 3) radiological features and/or functional patterns of interstitial lung disease; 4) evidence of antibodies against Microspora farin. BAL was performed after local anaesthesia [1]. A fibroptic bronchoscope was wedged in a segment of the right lobe or lingula and a total of 150 ml of sterile 0.9% saline (warmed to 37°C) was injected in 50 ml aliquots with immediate vacuum aspiration. BAL fluid was immediately filtered through two layers of surgical gauze and the volume measured. To separate cellular and non-cellular components, the fluid was centrifuged (800 rpm for 10 min) and washed twice with phosphate...
Table 1. - BAL analysis in HP patients

<table>
<thead>
<tr>
<th></th>
<th>HP group</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>5.2</td>
<td>1.7</td>
</tr>
<tr>
<td>SD</td>
<td>2.5</td>
<td>0.3</td>
</tr>
<tr>
<td>Neutrophils</td>
<td>33.9</td>
<td>92.6</td>
</tr>
<tr>
<td>Eosinophils</td>
<td>58.2</td>
<td>6.8</td>
</tr>
<tr>
<td>% of total cells</td>
<td>1.0</td>
<td>0.5</td>
</tr>
<tr>
<td>IgG/A ratio</td>
<td>4.40</td>
<td>0.27</td>
</tr>
<tr>
<td>IgA/A ratio</td>
<td>0.39</td>
<td>0.13</td>
</tr>
<tr>
<td>Precipitin detectable</td>
<td>31/42</td>
<td>0/7</td>
</tr>
<tr>
<td>Detectable amount</td>
<td>4/10</td>
<td>0/7</td>
</tr>
<tr>
<td>125I C1q binding</td>
<td>7/10</td>
<td>0/7</td>
</tr>
<tr>
<td>Positive cases (24/24)</td>
<td>18/24 (75%)</td>
<td>0/24</td>
</tr>
</tbody>
</table>

Ma: macrophages; Ly: lymphocytes; Ne: neutrophils; Eo: eosinophils; A: albumin.

**Fig. 1.** Correlation between the percentage of neutrophils and the time of the last exposure to antigen.

buffered saline without Ca" and Mg". The following parameters were determined: cells·ml⁻¹ (counting chamber); differential cell count; albumin, IgG and IgA (radial immunodiffusion in agar) expressed as mg·ml⁻¹ and as IgG/albumin and IgA/albumin ratio; immune complexes (binding test using radio-iodinated human C1q (125I-C1q)) expressed as % of binding. Values ≥ mean+2sd for the control group were considered positive; presence of antibodies against M. faeni (double immunodiffusion plates).

Ten (10 ml) BAL samples were lyophilized and reconstituted with 2 ml of distilled water and the following parameters determined. C1q and C3 (radial immunodiffusion in agar) considered positive when detectable; chemotactic activity for neutrophils (Blind Well micro pore filter technique with 3 μm nucleopore filters). Neutrophils were obtained from peripheral blood of a normal volunteer by sedimentation in plasma gel. 200 μl of the responding cells (2.3×10⁶ in Gey's medium containing 2% bovine serum albumin) were seeded in the upper compartment of the chemotactic chamber and 200 μl of the concentrated BAL fluid placed in the lower compartment. Incubation time was 120 min at 37°C in a 5% CO₂ incubator. The samples were also incubated with antisera to human C5a and the above procedure performed. Stained filters were examined and the number of cells that had migrated through the filter was counted in 5 random fields. Chemotactic activity was expressed as cells/high power field (hpf) minus the cells of Gey's medium alone.

All data were expressed as mean and sd. Patients and controls were compared using Student's t-test. Linear regression analysis was applied to determine the relationship between % neutrophils and time lapse from last exposure. Values of p<5% were considered significant.

Data from BAL (table 1) show that in HP patients the yield of cells·ml⁻¹ was threefold that in controls and mainly represented by lymphocytes (p<0.01). There was a significant increase in % neutrophils (p<0.05). The latter was inversely related to time lapse from last antigen exposure (r=0.41, p<0.01) (fig. 1). Immunoglobulin levels showed an increase of both IgG (p<0.05) and IgA (p<0.05). BAL samples contained specific precipitins (31/42 and detectable amounts of C1q (4/10) and C3 (7/10). Specific precipitins, C1q and C3 were not found in control BAL. Immune complexes were present in 18/24 cases.

**Fig. 2.** Neutrophil chemotactic activity in hypersensitivity pneumonitis. A: prior to antibody exposure; B: after exposure to anti-C5a/C: controls; *: p<0.05; hpf: high power field.

The following parameters were determined: cells·ml⁻¹ (counting chamber); differential cell count; albumin, IgG and IgA (radial immunodiffusion in agar) expressed as mg·ml⁻¹ and as IgG/albumin and IgA/albumin ratio; immune complexes (binding test using radio-iodinated human C1q (125I-C1q)) expressed as % of binding. Values ≥ mean+2sd for the control group were considered positive; presence of antibodies against M. faeni (double immunodiffusion plates).

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Functional activities of human alveolar macrophages

G. Velluti, O. Capelli, L. Richeldi, E. Prandi, M. Lega, E. Rovatti, M. Covi

Human alveolar macrophages (HAMs) from healthy subjects and patients with lung diseases are studied. In 1985, HAMs from control smokers were found to have an acid phosphatase (AP) activity 4-5 fold higher than nonsmokers, whilst HAMs from sarcoid patients had a decreased AP activity. Preliminary data on phagocytosis and intracellular killing in various lung diseases are shown in Table 1.

In the acquired immune deficiency syndrome (AIDS) the HAMs showed a severe impairment of antimicrobial function, accounting for frequent lung involvement. The killing percentage of lung tumours, although not significantly different, is lower than controls as is in AIDS patients, supporting data recently reported from other authors.

In our experimental system, mean phagocytosis and killing do not change significantly for a staphylococcus: HAM ratio range between 10:1 and 50:1. However, our preliminary results suggest a possible...