one is faced with a serious problem with few drugs left to use prior to the use of a paralyzing agent with artificial respiration. If there is no significant tachyarrhythmia, one can try atropine solution by inhalation. Unfortunately, most patients have tachyarrhythmia precluding further use of sympathomimetic drugs or recently advocated atropine solution inhalation.

During the past 8 years one of us (TKS) has been using ACTH, 40 units IV, continuously every 8 hours in addition to therapy including high dosage of corticosteroids and aminopyrine in these patients. After 48 to 72 hours' administration patients start to respond, thereby avoiding endotracheal intubation, muscle paralysis, artificial ventilation, and in rare instances, bronchial lavage. Once their respiratory status stabilizes, we discontinue ACTH altogether and start weaning from corticosteroids over a period of days.

We do not know how the addition of ACTH benefits these patients, but most likely through its pharmacologic effect as the adrenal cortex is most likely suppressed by the time of its use.

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Bronchoalveolar T-cell Subsets in Gold Lung

Evidence for a Hypersensitivity Reaction

To the Editor:

We read with interest the recent article by Ettensohn et al. It was the first case report on bronchoalveolar lavage (BAL) in gold lung. Their patient had elevated numbers of lymphocytes in the BAL fluid. The authors concluded that this would suggest a hypersensitivity-related pathogenesis of gold-induced lung disease.

We completely agree with this interpretation. In a 54-year-old man with gold lung we were able to perform, in addition to usual cell differentials, monoclonal antibody studies on BAL lymphocytes. This was not done before in gold lung. Data are shown in Table 1. The proportions of T-cell subsets in this case were strikingly similar to those recently reported by us and others in patients with hypersensitivity pneumonitis (low T3/T4 ratio, increase in L3 T-cells). The more moderate increase in lymphocytes and the additional increase in polymorphonuclears found in our patient may be due to a more fibrotic stage of disease compared to the one reported by Ettensohn et al.

We think that the profile of T-cell subsets in the BAL fluid of our patient with gold lung supplies further evidence for a hypersensitivity reaction to gold in the pathogenesis of this disease.

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REFERENCES


To the Editor:

Ettensohn et al underlined the diagnostic value of bronchoalveolar lavage (BAL) lymphocytosis in a case of gold lung. Indeed, they state that this lymphocytosis is consistent with a manifestation of a cell-mediated hypersensitivity reaction to gold salts of this side-effect. We fully agree and would like to add further information obtained from BAL cell data in the same circumstances.

We recently observed a similar case of rheumatoid arthritis in a 22-year-old nonsmoking woman who was receiving, for 3 months, weekly injections of 10 mg of gold sodium thiomalate. She then presented exertional dyspnea and a chest roentgenogram showed diffuse interstitial infiltrates. All routine laboratory tests were normal. Pulmonary function tests were consistent with a restrictive pulmonary process. BAL was performed according to the usual technique. Total cell count revealed 675 x 10⁶ cells per ml, with 72% lymphocytes, 27% macrophages and 1% neutrophils. Lymphocyte subpopulations evaluated with OKT monoclonal antibodies showed 30% OKT⁺, and 50% OKT⁺⁺, lymphocytes and an inverted ratio of 0.43. Gold salt treatment was discontinued and prednisone therapy (40 mg daily) was initiated. After 1 month, clinical improvement was marked, and 3 months later, the appearance on chest roentgenogram returned to normal along with the pulmonary function test results, while BAL data were as follows: total cell count, 34 x 10⁶ cells per ml with 20% lymphocytes, 80% macrophages; OKT⁺, 62%; OKT⁺⁺, 24%; OKT⁺⁺⁺, 2.58.

Therefore, BAL lymphocytosis and an inverted T-helper to T-suppressor cell ratio seem to be most valuable indexes of gold-induced hypersensitivity pneumonitis. Indeed, such findings already have been recorded in other cases of drug-induced hypersensitivity pneumonitis and also in cases of hypersensitivity pneumonitis due to inhalation of organic dusts. Moreover, as suggested in previous reports, we ourselves performed a provocation test in another case of drug-induced hypersensitivity pneumonitis; this test was done together with BAL cell analysis. BAL lymphocytosis initially at 83% fell to 46% after a drug withdrawal period of 54 days and increased to 64% 37 days after drug resumption. Consequently, in such circumstances the provocation test coupled with BAL seems to be a most valuable investigation.

In summary, all of these BAL data may allow the clinician to diagnose such drug-induced pulmonary side effects and obviate the need for tissue biopsy.

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Table 1—BAL Data in a Patient with Gold-induced Lung Disease

<table>
<thead>
<tr>
<th>Fluid instilled recovered</th>
<th>100ml</th>
<th>(54 ± 15)</th>
</tr>
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<tbody>
<tr>
<td>Total cell count</td>
<td>27 x 10⁶</td>
<td>(7 ± 2)</td>
</tr>
<tr>
<td>Macrophages</td>
<td>74%</td>
<td>(92 ± 4)</td>
</tr>
<tr>
<td>Lymphocytes</td>
<td>15%</td>
<td>(7 ± 3)</td>
</tr>
<tr>
<td>Polymorphonuclears</td>
<td>11%</td>
<td>(1 ± 1)</td>
</tr>
<tr>
<td>Pan T-cells (Leu-1⁺)</td>
<td>92%</td>
<td>(73 ± 5)</td>
</tr>
<tr>
<td>Helper/inducer (T₃⁺⁺)</td>
<td>11%</td>
<td>(55 ± 12)</td>
</tr>
<tr>
<td>Suppressor/cytotoxic (T₃⁺)</td>
<td>82%</td>
<td>(32 ± 7)</td>
</tr>
<tr>
<td>T₃⁺/T₄ ratio</td>
<td>0.13</td>
<td>(1.9 ± 0.8)</td>
</tr>
<tr>
<td>Activated T cells (L1⁺)</td>
<td>61%</td>
<td>(3 ± 3)</td>
</tr>
</tbody>
</table>

*The patient had received a total of 500 mg gold thiomalate over 4 months. Normal values are in parentheses, ± S D. Data of T-cell subsets are given as % of lymphocytes.
Local Immunopathologic Findings in Bronchiolitis Associated with Collagen Vascular Diseases

To the Editor:

Lahdensuo et al (Chest 1984; 85:705-08) reported a patient suffering from a classic rheumatoid arthritis and granulomatous bronchiolitis. In addition, immunofluorescence studies showed IgM- and IgG-containing plasma cells in the bronchiolar walls. The authors suggested cell-mediated immune reactions as the cause of this granulomatous lung tissue inflammation. In their opinion, however, it might also be the result of an immune complex (IC) mediated inflammatory response induced by treatment with anti-rheumatic drugs.

Recently we described, in a rheumatoid arthritis patient, a rapidly progressive oblitative bronchiolitis.1 The patient was treated with d-penicillamine for the last two years before admission. As described in previous reports,2,3 the histology of the lung revealed the same fibrous, infiltrative narrowing of the small airways and, at some places, obliteration by inflammatory cells. No granuloma was found. Immunofluorescence studies, however, showed granular depositions of IgM, suggesting IC deposits in the lung tissue.

In a further report we described a group of 15 patients with diffuse pulmonary disorders associated with collagen vascular diseases.4 Most (10 of 15) suffered from classic rheumatoid arthritis. At the time of the study, none was being treated with anti-rheumatic drugs. These studies revealed very high local concentrations of IC in the lungs, but no evidence of granulomatous tissue injury.

Recently, we studied the possible changes in local cellular immune reactions in 13 of these patients compared with eight healthy control subjects. None of the patients or controls was smoking. Bronchoalveolar lavage (BAL) T-cell-subsets were identified with monoclonal antibodies using an immunoperoxidase technique. Results are summarized in Table 1.

The OKT 4+ / OKT 8+ (helper/suppressor) ratio was strikingly decreased in patients compared with control subjects (p<0.001). These results are in contrast with what is reported in granulomatous pulmonary injury in systemic diseases such as sarcoidosis.5 Therefore, we conclude that in lung involvement in rheumatic disorders, local immune complex does not induce granulomatous lung injury nor is the local cellular immune reaction likely to do so.

Table 1—BAL Lymphocyte Subsets (Mean ± 1 SD)

<table>
<thead>
<tr>
<th></th>
<th>OKT 3+</th>
<th>OKT 4+ / OKT 8+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients, n = 13</td>
<td>77.7 ± 11.8</td>
<td>0.52 ± 0.23</td>
</tr>
<tr>
<td>Controls, n = 8</td>
<td>76.3 ± 2.2</td>
<td>1.85 ± 0.7</td>
</tr>
</tbody>
</table>

To the Editor:

Why granulomas can occasionally be seen in rheumatoid lungs is an interesting problem.1,4 In our patient, the speculation about the formation of granulomatous reaction in the bronchioli was based on the report of Spector and Heesom1 who observed granulomas after injection of immune complexes. In addition, it is known that many different pathogenetic processes, infectious as well as noninfectious, immunologic as well as nonimmunologic, can result in the formation of granulomas.4,5

Our immunofluorescence findings seem to be in line with those of Dr. Jansen, both suggesting the phlogistic role of local immune complexes in rheumatoid lung tissue. There is convincing experimental evidence that immune complexes formed in the alveolar interstitium can produce inflammatory reactions.4 Immune complexes, often together with secondary mediatory systems, eg, the complement, are known to be tissue damaging. Because all the common granulomatous diseases could be clinically excluded in our patient, we suggest that the granulomatous reaction seen in the bronchioli of our rheumatoid patient might reflect either cell-mediated component of antigen-induced tissue damage or foreign body reaction to immune complexes.

We are very grateful for the valuable comments and additional information Dr. Jansen has provided about this complex and interesting matter.

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