Chlamydial Infection Showing Migratory Pulmonary Infiltrates

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Abstract

A 70-year old man was admitted to our hospital because of nonproductive cough, fever and increasing dyspnea associated with alveolar opacities on chest roentgenogram, which later migrated to previously unaffected areas. The diagnosis of *Chlamydial* pneumonia was made on serological grounds. Organizing pneumonia was documented by transbronchial lung biopsies and the subsequent course was satisfactory under minocycline therapy. *Chlamydial* infection should be considered in the differential diagnosis of migratory pulmonary infiltrates.

Key words: *Chlamydia pneumoniae*, migratory pulmonary infiltrates, cryptogenic organizing pneumonia

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Introduction

Migratory pulmonary infiltrates are associated with some diseases (1-7) including atypical pneumonias such as *Mycoplasma pneumoniae* and *Legionella* (7). We recently encountered a patient in whom these radiological findings were due to *Chlamydial* infection. This connection has not previously been emphasized in the literature. *Chlamydial* infections should be considered in the differential diagnosis of migratory pulmonary infiltrates.

Case Report

A 70-year old man was admitted to our hospital with a 5-day history of fever, cough and exertional dyspnea. A 3-day cefditoren pivoxil treatment has been unsuccessful, and at admission, he had tachypnea and a fever of 39.2°C. Physical examination revealed sparse crackles over the left lung field. Laboratory studies disclosed the following values: PaO2, 54 Torr; PaCO2, 27 Torr (measured while the patient was breathing room air); WBC count, 7,900/mm3 (91% neutrophils, 7% lymphocytes); CRP, 33.2 mg/dl; and erythrocyte sedimentation rate, 103 mm/h.

A chest roentgenogram on admission revealed ground glass opacities and consolidations in the left upper and lower lung fields (Fig. 1a). The initial antibiotic therapy consisted of panipenem/betamipron via the intravenous route: the patient continued to have fever, cough and exertional dyspnea. Chest roentgenogram and computed tomography (CT) obtained 3 days after admission (on the 4th hospital day) revealed improvement of the opacities in the left lung with new air space opacities in the right middle lung field (Fig. 1a and 1b). There was no evidence of lymphadenopathy or pleural effusion on a CT examination of the chest, which confirmed the air-space opacities noted on the chest roentgenogram (Figs. 2 and 3).

The patient underwent a fiberoptic bronchoscopy on the 7th hospital day. Bronchoalveolar lavage count revealed 18.0×105 cells/ml, with 35% macrophages and 65% lymphocytes. No pathogen was identified. Transbronchial lung biopsies revealed intraluminal fibrosis of the distal airspaces (Fig. 4). The complement-fixation test for *Chlamydia* group showed a four-fold increase (from ×16 to ×64) and the microimmunofluorescence test for *Chlamydia pneumoniae* IgG revealed diagnostic rise (from ×256 to ×2,048). The

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Figure 1. a): A chest radiograph obtained on admission shows air-space opacification in the left upper and middle lung fields. b): A chest radiograph obtained on the 4th hospital day shows resolution of the left lung field with new area of air-space opacification in the right middle lung field.

Figure 2 and Figure 3. Sequential evaluation of the chest computed tomography was obtained on admission (Fig. 2); and on the 4th hospital day (Fig. 3). This illustrates the spontaneous migratory pattern of the airspace opacifications, which began in the left upper lobe, and then spread to the right lung with the resolution of the left lung field.

Figure 4. Light microscopic section of a transbronchial lung biopsy shows patchy buds of granulation tissue in the distal airspace. (Elastica van Gieson stain ×40)

microimmuno-fluorescence test was negative for Chlamydia psittaci and Chlamydia trachomatis (Table 1). Serological tests for Influenza virus type A, Influenza virus type B, Parainfluenza virus 1, 2 and 3, Adenovirus, Respiratory syncytial virus, Legionella and Mycoplasma pneumoniae were negative. Rheumatoid factor was slightly positive, while antinuclear antibodies were negative. Neither connective tissue disease nor inhalation injury were detected.

Therapy with minocycline was started, which resulted in a dramatic clinical improvement. After 2 weeks of this treatment, the patient had no complaints and the chest roentgenographic findings were unremarkable.

Discussion

The present patient showed a four-fold increase on a complement-fixation test for Chlamydia psittaci. This test, which is widely available and used to diagnose psittacosis, is genus specific (8). Therefore, it cannot distinguish between antibodies to Chlamydia trachomatis, Chlamydia psittaci, and Chlamydia pneumoniae. These three Chlamydial species cause pneumonia in humans (9-11). In our case, Chlamydia pneumoniae was very likely to be responsible because of the high prevalence of Chlamydia pneumoniae and eightfold increase in immunoglobulin G (IgG) Chlamydia pneumoniae antibody titers. Cross-reactions between species can explain the overall serological results. On the basis of accepted serologic criteria as previously described
Table 1. Serological Results for *Chlamydiae* during Hospitalization and after Recover

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<thead>
<tr>
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<th>On admission</th>
<th>after recovery</th>
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<tbody>
<tr>
<td><em>Chlamydia psittaci</em></td>
<td>x 16</td>
<td>x84</td>
</tr>
<tr>
<td>Complement fixation test</td>
<td></td>
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<tr>
<td><em>C. pneumoniae</em> IgM antibody titer (MIF)</td>
<td>&lt; x8</td>
<td>&lt; x8</td>
</tr>
<tr>
<td><em>C. pneumoniae</em> IgG antibody titer (MIF)</td>
<td>&lt; x256</td>
<td>&lt; x2048</td>
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<tr>
<td><em>C. psittaci</em> IgM antibody titer (MIF)</td>
<td>&lt; x8</td>
<td>&lt; x8</td>
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<tr>
<td><em>C. psittaci</em> IgG antibody titer (MIF)</td>
<td>x8</td>
<td>x8</td>
</tr>
<tr>
<td><em>C. trachomatis</em> IgM antibody titer (MIF)</td>
<td>&lt; x8</td>
<td>&lt; x8</td>
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<tr>
<td><em>C. trachomatis</em> IgG antibody titer (MIF)</td>
<td>x128</td>
<td>x128</td>
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C. *Chlamydiae* MIF: microimmunofluorescence test

(8), our patient was identified and categorized as having an acute reinfection.

Previous reports on the radiological appearance of *Chlamydia* infection showed that homogeneous lobar or segmental shadows, and patchy ones were the common radiological abnormalities (12, 13). Spreading of shadows within the same lung and also to the previously unaffected opposite lung have been seen in a few patients (12). However, it has not been fully discussed, whether or not these radiological findings are simple deterioration or migration of shadows. The present patient was quite unusual in that the air-space consolidations were migratory of fleeting in nature. Computed tomographic scans of our patient, which were taken at the time of admission and the 4th hospital day, highlighted the migration of the infiltrates.

Idiopathic BOOP, which is now termed cryptogenic organizing pneumonia (COP) (14), is one of the best examples of disease process where fleeting or migratory pulmonary infiltrates can be seen (1-3). Transbronchial lung biopsies of our patient revealed intraluminal fibrosis of the distal airspaces, which was compatible with COP. These pathological findings can be seen as nonspecific reactions to injury and also occur in association with some infections (15, 16).

There are some reported cases of organizing pneumonia due to atypical pneumonias (7, 17-19), and some of them recovered without steroid therapy (7). Epler et al reported that three patients with COP responded to tetracycline or erythromycin (20). We suspect that infectious agents such as *Mycoplasma pneumoniae* and *Chlamydia* may have caused some cases of COP and some of them may have shown migratory pulmonary infiltrates.

Miyagawa et al (7) described 11 patients with migratory pulmonary infiltrates and found some immunological abnormalities, suggesting that immunological reaction is thought to be one of the etiologies of these radiological findings. However, our patient showed no increase in circulating immune complexes. The possibility can not be dismissed that these radiographic findings may be responsible for an inadequate treatment of the disease, because our patient showed a dramatic improvement with minocycline therapy. Thus, appropriate serological tests should be part of the etiological search in this clinical picture and, conversely, the initial antibiotic therapy of patients with community-acquired pneumonia should therefore be effective against the common pathogens.

References


