Case Report

A Patient with Amyopathic Dermatomyositis and Interstitial Lung Disease

Chi-Keung Sung and Emily Kun

Abstract: Interstitial lung disease (ILD) is a well-recognized manifestation of dermatomyositis. However the clinical presentation of ILD in amyopathic dermatomyositis is different from that in classical dermatomyositis. We report a patient who developed acute onset of ILD with skin rash suggestive of dermatomyositis in the absence of overt myositis. Reported cases of ILD in amyopathic dermatomyositis are often acute in onset and rapidly deteriorating despite potent immunosuppressive therapies. Histologically, diffuse alveolar damage is the commonest finding.

Keywords: Amyopathic dermatomyositis, diffuse alveolar damage, interstitial lung disease

Introduction

The pulmonary system can be affected in a number of ways in patients with idiopathic inflammatory myopathies. These include respiratory muscle weakness, aspiration pneumonia secondary to pharyngeal muscle dysfunction, opportunistic infections, pneumonitis secondary to drug treatment and interstitial lung disease (ILD) related to the disease itself. ILD is a well recognized manifestation of dermatomyositis (DM) and polymyositis (PM), with a reported prevalence of up to 40%. On the other hand, ILD is much less frequent in amyopathic dermatomyositis (ADM). Most patients were reported in Japan and Taiwan. We hereby report a patient with ADM who presented with rapidly progressive ILD. He succumbed despite high dose steroid therapy.

Case Report

A 51-year-old man was admitted in June, 2004 with a one-week history of fever, productive cough and shortness of breath. Two weeks before admission, he was hospitalized for excision of toe callosity. He was febrile on the current admission. Faint maculopapular rash was noticed over his forehead, finger knuckles and elbows. Clinically no proximal muscle weakness could be demonstrated. On auscultation, there were fine crackles in both lung bases. Total white cell count was normal while lymphocyte count was low (0.6 x 10^9 /L). Muscle enzymes were normal. The ESR was 55 mm/hour. A chest radiograph showed bilateral lower zone consolidations. In view of fever and recent hospitalization, he was treated as a case of hospital acquired pneumonia with broad-spectrum antibiotics.

His clinical response to antibiotics therapy was poor. Microbial investigations did not reveal any pathogens. Bronchoscopy performed one week after admission revealed no endobronchial lesion. Transbronchial lung biopsy was not done because of hypoxia during the procedure. Bronchoalveolar lavage showed inflammatory cells and was cultured negative for bacteria, pneumocystis carinii and acid fast bacilli. High resolution computed tomographic scan (HRCT) showed patchy ground-glass opacities and alveolar...
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infiltrates at the periphery of both lungs, occasional subpleural lines at both lower lobes, with the overall findings being compatible with bronchiolitis obliterans organizing pneumonia (BOOP) (Figure 1). Low dose systemic steroid (hydrocortisone 50 mg intravenous every eight hours) was started for the HRCT findings of BOOP around ten days after admission. Skin biopsy was performed because his skin rash, though not typical, raised the suspicion of dermatomyositis.

His fever ran down but chest condition deteriorated as evidenced by increasing dyspnoea and increasing oxygen requirement. Skin biopsy showed superficial perivascular dermatitis with mild edema and mucinous change in the upper dermis, a pattern of which was compatible with dermatomyositis. Autoimmune markers were negative, including ANA and anti-Jo-1 antibody. He was then diagnosed as acute pneumonitis associated with suspected underlying amyopathic dermatomyositis. A total of five days intravenous pulse methylprednisolone 500 mg daily was given at around three weeks after admission. Open lung biopsy at that time showed acute and organizing diffuse alveolar damage.

Fever recurred after a course of intravenous pulse methylprednisolone and CXR showed new infiltration. Sputum grew Pseudomonas aeruginosa. Further immuno-suppressive therapy like cyclophosphamide was not attempted because of the superimposed chest pneumonia. He developed progressive type 1 respiratory failure requiring mechanical ventilation at around four weeks after admission. Despite multiple antibiotics therapy and reduction in the dosage of steroid (prednisolone 20 mg daily), sepsis persisted with sputum repeatedly grew Pseudomonas and blood culture positive for coagulase negative Staphylococci. Multi-organ failure occurred and he succumbed six weeks after admission.

Discussion

The prevalence of ILD in patient with idiopathic inflammatory myopathy varies. With the use of HRCT, the pick up rate is higher than using chest radiograph or lung function test and it can be as high as 65%. In a recent retrospective study involving 156 consecutive PM/DM patients, the prevalence of symptomatic ILD was 23.1% with

![HRCT of lung shows features suggestive of BOOP.](image-url)
the use of chest radiographs and pulmonary function test. With regard to the presentation, ILD can be classified into acute/subacute type resembling persistent community acquired-pneumonia refractory to antibiotics therapy, chronic type presenting with slowly progressive dyspnoea, or asymptomatic type. It was estimated that insidious onset is the commonest mode of presentation (58.3%), while acute/subacute and asymptomatic patients comprise 16.7% and 25% of cases respectively. Symptomatic patients with ILD usually present with non-productive cough and exertional dyspnoea that are accompanied by bilateral basal fine crackles. The onset of these pulmonary symptoms can precede the presence of myositis.

Several studies compared the clinical pictures of PM/DM patients with and without ILD. Grau et al found that arthralgia and fever were more frequently observed in patients with ILD. Consistent with Grau's findings, Marie et al also observed that arthralgia / arthritis was the only predicting factor for the occurrence ILD, while malignancy was negatively associated with ILD. Characteristic nailfold capillaroscopic microangiopathy was also found to be predictive of higher chance of ILD.

Anti-Jo-1 antibody appears to be more commonly found in patients with ILD. The overall prevalence of anti-Jo-1 antibody in DM is around 20% whereas the prevalence in those with ILD was found to be 38% and 73.3% in two separate studies. Marie et al investigated the ILD features of PM/DM patients with and without anti-Jo-1 antibody. It was found that the clinical presentations and lung histology were similar in both groups except that all patients with anti-Jo-1 antibody were symptomatic while one third of anti-Jo-1 antibody negative ILD patients were asymptomatic. In predicting the survival or outcome, anti-Jo-1 antibody is not useful.

The typical lung function test abnormality in DM-related ILD is a restrictive lung pattern together with a reduced diffuse capacity. In the study by Marie et al, lung function test abnormalities were present in all ILD cases. Another study showed that nearly all ILD patients had reduced DLCO while over 80% of cases had restrictive lung pattern. Therefore, lung function test is a fairly sensitive test in detecting ILD.

The most common CXR feature of DM-related ILD is bilateral lower zone irregular linear opacities. Consolidation is the next common finding while honeycombing and pleural effusion may also be present. HRCT is more sensitive in detecting abnormalities. Common HRCT findings include irregular linear opacities, consolidation and ground glass opacities. The distribution is predominantly lower lobes, especially for consolidation. Initial computed tomographic scan abnormality is predominant subpleural consolidation which corresponds to bronchiolitis obliterans organizing pneumonia. As the disease progresses, it slowly evolves into honeycombing equivalent to irreversible pulmonary fibrosis.

A number of histological patterns have been described, namely nonspecific interstitial pneumonia (NSIP), usual interstitial pneumonia (UIP), bronchiolitis obliterans organizing pneumonia (BOOP), diffuse alveolar damage (DAD) and lymphocytic interstitial pneumonia (LIP). Although the reported incidence of these different histological patterns varies (Table 1), one rather consistent observation is that NSIP appears to be the most common histological finding.

Survival rates of patient with idiopathic inflammatory myopathy and concomitant ILD were 85.8%, 74.4% and 60.4% at 1, 3, 5 year. There was no consistent data to show if ILD conferred a poor prognosis in patient suffering from idiopathic inflammatory myopathy. In one study, decreased survival was observed in patients with ILD compared to those without ILD (60% at 31 months vs 76% at 60 months). However, no significant difference in deterioration was found in patients with and without ILD in two other studies. When compared to patients suffering from biopsy-proven idiopathic

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**Table 1. Prevalence of different histological patterns in ILD associated with DM**

<table>
<thead>
<tr>
<th></th>
<th>NSIP</th>
<th>UIP</th>
<th>BOOP</th>
<th>DAD</th>
<th>LIP</th>
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<tbody>
<tr>
<td>Marie et al</td>
<td>36.4%</td>
<td>45.5%</td>
<td>18.1%</td>
<td>0%</td>
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<tr>
<td>Douglas</td>
<td>82%</td>
<td>4.5%</td>
<td>4.5%</td>
<td>9%</td>
<td>0%</td>
</tr>
<tr>
<td>Cottin et al</td>
<td>69%</td>
<td>12.5%</td>
<td>12.5%</td>
<td>0%</td>
<td>6%</td>
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Nonspecific interstitial pneumonia (NSIP), Usual interstitial pneumonia (UIP), Bronchiolitis obliterans organizing pneumonia (BOOP), Diffuse alveolar damage (DAD), Lymphocytic interstitial pneumonia (LIP)
pulmonary fibrosis, the survival rate was better for patients with PM/DM associated ILD. Among a number of clinical and paraclinical variables, only acute/subacute onset of pulmonary symptoms and neutrophil alveolitis (BAL analysis) were found to be significantly associated with deterioration due to ILD. Over half of the patients will respond to steroid therapy especially when the disease is in the early phase and fibrosis was minimal. Rapidly progressive disease warrants the use of immunosuppressive agent including azathioprine or cyclophosphamide.

ADM is a well-recognized subset of DM and constitutes around 5% of all patients with DM. In 1993, Euwer and Sontheimer put forward the four diagnostic criteria for ADM:

1. Cutaneous change pathognomonic of DM
2. Skin biopsy specimen findings compatible with DM
3. No clinical evidence of proximal motor weakness within 2 years of skin disease, and
4. Normal skeletal muscle enzyme for 2 years after appearance of skin lesions

Lung involvement appears to be rare in ADM according to two recent reviews of ADM. Only five case of asymptomatic ILD was found in the review of thirty seven ADM patients while there was no case of ILD in another review of thirteen ADM patients. Sontheimer did a review of case reports describing the development of ILD in ADM and found a total of 34 published literatures. Base on this review, the estimated of prevalence was around 5-10% which was not rare than we previously believed. Clinical features of ILD in ADM patients were different from patients with clinical myositis and they were summarized as follow:

1. Male to female ratio was 20:14
2. Fatal outcome occurred in 53%
3. Anti-Jo-1 antibody was negative in all patients
4. ESR was moderately elevated, mean value 44 mm/hour
5. Malignancy was found in one patient (out of 34 cases)
6. 27 (out of 34) published cases were from Japan

Different from PM/DM, anti-Jo-1 antibody is not present in patients with ADM and ILD. Anti-alanyl tRNA synthetase (PL-12) may be a more useful marker in ADM patients. It was found that patients with anti-PL 12 were more likely than anti-Jo-1 patients to have ILD either without myositis or with subclinical signs of muscle disease. Presence of anti-CADM-140 autoantibodies may also be another potentially useful novel marker in ADM. These autoantibodies were associated with rapidly progressive ILD.

In ADM patients developing acute ILD, the treatment response is very poor despite potent immunosuppressant. There was a small case series in Taiwan consisting of five patients suffering from idiopathic inflammatory myopathy together with ILD and three patients were diagnosed to have ADM. All three ADM patients ran a fatal course within a few months after the development of ILD despite the use of pulse methylprednisolone and cyclophosphamide. Two ADM patients underwent open lung biopsy which gave a pathological proof of diffuse alveolar damage. Case report showed that steroid plus cyclosporine may be useful.

Our patient likely suffered from ADM, although lack of myopathy for two years is required for diagnosis according to the strict criteria laid down by Euwer and Sontheimer. Three weeks after the onset of dyspnoea, intravenous pulse methylprednisolone was given and open lung biopsy at that time already showed diffuse alveolar damage. He died six weeks after admission. His rapid clinical progression was similar to other case reports of ILD in ADM patients in which rapid deterioration of lung histology was also reported. Facing this rapidly fatal disease, early recognition and early use of potent immunosuppressive therapy may be the only strategy.

**Conclusion**

ILD in ADM is not a rare condition. Interestingly, more of these cases have been reported in Asian countries. Clinical presentation and outcome are different from the ILD associated with PM/DM. Male patients are affected more commonly. Anti-Jo-1 antibody is usually absent. The clinical course is often a rapidly fatal one and the histology is diffuse alveolar damage. The response to immunosuppressive treatment is often poor.

**References**


