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LABORATORY FINDINGS, PHYSICAL and CLINICAL FEATURES OF *MYCOPLASMA PNEUMONIAE* INFECTIONS. ANALYSIS OF 21 CASES

MİKOPLAZMA PNÖMONİSİ TANISI ALAN 21 OLGUNUN KLİNİK, RADYOLOJİK VE FİZİK MUAYENE BULGULARI YÖNÜNDEN DEĞERLENDİRİLMESİ

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SUMMARY

Background: Mycoplasma pneumoniae (M. pneumoniae) is a well known causative agent of infection in childhood but clinical presentation may be variable. In this study we aimed to evaluate laboratory findings, physical and clinical features of pneumonia due to M. pneumonia in 21 children retrospectively.

Methods: Clinical data of 21 children with pneumonia due to M. pneumoniae who were hospitalized in our institution from 1998 through 2004, were collected from the medical records and entered into a database. M. pneumoniae was diagnosed with antibody immünofluorescent assay (IFA) test system in 21 patients. In all patients, the diagnosis of active infection relied on the presence of Ig M antibodies.

Results: Patients with M. pneumoniae infection included 17 female and 4 male. Mean age of patients was 7.90 ± 3.30 years (range, 2-16 years). Most of our cases had bilateral lung involvement. Most frequent X-ray finding was perihilar linear opacities. No significant complication was observed during the therapy.

Conclusions: Children with pneumonia needed admission to the hospital emphasizes the need for early identification. Routine laboratory studies are not likely to distinguish between low respiratory tract infections due to M. pneumoniae and to viruses. Early identification of the pathogen and treatment improves the outcome of the pneumonia and reduces the associated mortality and morbidity.

INTRODUCTION

Primary atypical pneumonia was first described by Eaton et al. in 1944 when they isolated its agent in sputum and filtrated pulmonary suspensions drawn from patients with a presentation of atypical pneumonia. In 1957, Liu identified Eaton's agent using fluorescent antibody techniques, and developed a specific serological test. Finally, in 1962, Chanock et al. cultured the agent in artificial medium and identified the microorganism as belonging to the Mycoplasma family (1).

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Mycoplasma pneumoniae (M. pneumoniae) is the most frequent etiologic agent of a lower respiratory tract infection formerly called primary atypical pneumonia (pneumonia with sputum containing neutrophils but no bacterial pathogen cultured) (2). Moreover, it may rarely cause extra-pulmonary diseases, such as meningitis, hepatitis, hemolytic anemia, arthritis, pericarditis, and myocarditis (3).

Mycoplasma pneumonia is both an epidemic and endemic disease, more prevalent in fall and early winter. Estimates of the percent of pneumonias caused by M. pneumoniae vary from 7%-30% for children 5-9 years of age to 14%-51% in children 10-16 years of age. Clinical presentation of Mycoplasma pneumonia is variable, and diagnosis confirmation is a challenge to even the most experienced clinicians (4). Most infections are mild and non-pneumonic (5). Pathogen is transmitted by the respiratory route, and the incubation period from infection to disease is roughly 2-4 weeks. Initial symptoms typically consist of general malaise, myalgia, sore throat, headache, and fever. These symptoms are indistinguishable from those due to influenza and other viruses that cause respiratory tract disease (2,6,7,8).

In this study we aimed to evaluate laboratory findings, physical and clinical features retrospectively in 21 children with pneumonia due to M. pneumoniae.

METHOD

Clinical data of 21 patients with pneumonia due to M. pneumoniae who were hospitalized in our institution from 1998 through 2003, were collected from the medical records and entered into a database.

The diagnosis of pneumonia was performed with characteristic clinical findings and chest radiographs. Chest radiographs (erect posteroanterior and lateral view) were taken in admission and were assessed by the consultant radiologist.

M. pneumoniae was diagnosed in 21 patients by using antibody immunofluorescent assay (IFA) test system. In all patients, the diagnosis of active infection relied on the presence of Ig M antibodies and 3 cases had also Ig G positivity.

Cases were excluded for the following reasons: chronic underlying disease, immundeficiency, who had only IgG positivity to M. pneumoniae.

RESULTS

Mean age of patients was 7.90 ± 3.30 years (range, 2-16 years). Most frequent symptom at enrollment of the cases hospitalized for M. pneumoniae pneumonia was cough (90%) (Table 1). Auscultation of the chest frequently revealed rales (crackles) in fourteen patients (67%). Rales with ronchi in four patients (19%) and ronchi with wheezing in three patients (14%) were other findings.

Table 1. Clinical characteristics of the cases.

Sign and Symptoms	Patients (n:21)	(%)
Rhinore	4	19
Sore throat	7	33
Cough	19	90
Fever	9	42
Chest pain	3	14
Sputum	9	42
Other (e.g,GİS,dermatologic,myalgia)	3	14

Three patients who had wheezing were 2, 4 and 5 years of age.

Erythrocyte sedimentation rate (mm/h) 58.6± 30.7 and white blood cell count (/mm^3) 10145± 3547 and CRP (mg/dl) 2.1±1.8 were moderately high. White blood cell count of the patients revealed leukocytosis in 62% patients, normal in 26% patients, leukopenia in 12% patients.

Chest radiographs documented bilateral pulmonary involvement in 57.5 % patients (Table 2).

Table 2. The features of the pulmonary involvement

Pulmonary localization	Patients (n:21)	(%)
Right medium lobe	1	4.5
Right lower lobe	2	9.5
Left upper lobe	2	9.5
Left lower lobe	4	19
Bilateral	12	57.5
Total	21	100

In this study, we showed that the most frequent X-ray finding was perihilar linear opacities (Table 3).

Table 3. Radiographic characteristics in patients

X-Ray findings	Patients (n:21)	(%)
Perihilar linear opacities	11	52
Hyperinflation	1	5
Lobar or segmental consolidation	8	38
Lobar involvement and pleural effusion	1	5
Total	21	100

Thorax CT was taken from 3 patients due to perihilar opacities on the chest radiographs. These patients had perihilar adenopathy on thorax CT (one had pleural effusion).

In all patients, the diagnosis of active infectionelied on the presence of Ig M antibodies and 3 cases had also Ig G positivity.

Parapneumonic complications of M. pneumoniae were observed in three patients. A female patient aged 8 admitted to the intensive care unit due to respiratory distress and pleural effusion. Pleural effusion resolved within 10 days.

One patient who was at the age of 9 showed maculopapular rush on her trunk for 5 days. This clinical finding was mild and disappeared spontaneously.

The other aged 9 was diagnosed as glomerulonephritis. His urinalysis demonstrated red blood cells with red blood cell casts and proteinuria. The blood pressure and the serum C3 level were normal. Oliguria was observed for 3 days and determination of the ASO and anti-DNase B titer were low. Urinary findings resolved within 15 days.

Six of 21 patients had prior antibiotic use before admission to the hospital. Three of them had been treated with oral penicilin, two with second generation cephalosporin, and one with macrolid. All patients received second generation cephalosporin for at least 24 hours after hospitalization.

After determination of IgM positivity to M. pneumoniae, initial treatment was changed to macrolid. Treatment regimen included clarithromycin in a dosage of 15mg/kg per day divided into two doses for 14 days. No significant complication was observed during the treatment.

DISCUSSION

Twenty-one patients with pneumonia due to M. pneumoniae were evaluated retrospectively. The highest incidence is seen in children aged between 3-14 years. In children younger than 5 years of age, M. pneumoniae infections are mostly mild and non-pneumonic. M. pneumonia infection is rarely diagnosed under the age of 6 months (9,10). Similarly, our cases mean age was 7.90 and the lowest age was 2.0.

The initial symptom is usually sore throat followed by cough (11). In our study most frequent symptom at enrollment of the cases hospitalized for M. pneumoniae pneumonia was cough. Cough and production of sputum in association with M. pneumoniae pneumonia varies between studies (12).

Despite the symptoms and chest x-ray findings there is characteristically little abnormality on physical examination. Auscultation of the chest frequently reveals crackles or wheezing or both, thus the appellation ‘walking pneumonia’ (13,14). Similarly, in our study, three patients who had wheezing were 2, 4 and 5 years of age.

Routine laboratory studies are not likely to distinguish between respiratory tract infections due to M. pneumoniae and to viruses. The peripheral white blood cell count is normal or slightly elevated, with neutrophilia. Reported erythrocyte sedimentation rates range from 20 to 100 mm/h, higher rates reflecting more severe pulmonary disease (13,15). In this study, erythrocyte sedimentation rate (mm/h) 58.6± 30.7 and white blood cell count (/mm^3) 10145± 3547 and CRP (mg/dl) 2.1±1.8 were moderately high. White blood cell count of the patients revealed leukocytosis in 62% patients, normal in 26% patients, leukopenia in 12% patients.

Chest radiograph documents lower respiratory involvement, but few features differentiate M. pneumoniae from viral or other bacterial pathogens. Patchy, unilateral, segmental, or subsegmental consolidation is typical, but diffuse, bilateral interstitial involvement (in 20% of cases) is also reported (16,17). In contrast, most of our cases had bilateral lung involvement. In this study, we showed that the most frequent X-ray finding was perihilar linear opacities. Similarly, this observation has been described before by Esposito et al (18). Thorax CT was taken from 3 patients due to perihilar opacities on the chest radiographs. These patients had perihilar adenopathy on thorax CT (one had pleural effusion). Hilar adenopathy, observed in 34 % of children in one study is seen more commonly in M. pneumoniae pneumonia than in pneumonia from most other causes (16).

Recurrent infection by M. pneumoniae is not uncommon. In people with pre-existing immunity against M. pneumoniae re-infection may occur after a lapse of 3 to 5 years (19). Re-infection is less commonly seen after pneumonia than after infection with minor symptoms. We had three Ig G positive patients to M. pneumoniae besides Ig M positivity. This might be explained by elevated antibodies measurable for 2 to 9 years after prior exposure (20).

Parapneumonic complications of M. pneumoniae in children are rare. In this study, a female patient aged 8 admitted to the intensive care unit due to respiratory distress and pleural effusion. Pleural effusion, reported 20% of patient in one study is generally noted less frequently and is small in volume (21). However, in the literature various complications are described in the skin (Stevens-Johnson syndrome) (22), the central nervous system (23), kidneys (24), heart (25), muscles (26) and the eyes (27). The pathophysiology of extrapulmonary manifestations of M. pneumoniae is not understood. It has been suggested that toxins or auto-antibodies play a role (28). Direct invasion of M. pneumoniae of the organs is

another possibility. In Stevens-Johnson syndrome as a complication of M. pneumoniae, 80% of the patients present with upper respiratory tract symptoms. However, 60% of these patients had abnormilities on a chest radiograph (22). In our study, one patient who was at the age of 9 showed maculopapular rashes on her trunk lasting 5 days. This clinical finding was mild and disappeared spontaneously. In a study, the incidence of the Stevens-Johnson syndrome associated with M. pneumoniae was about 1-5% (22). One patient aged 9 was diagnosed as glomerulonephritis. Glomerulonephritis is occasionally seen as a complication of M. pneumoniae pneumonia in children. Said et al (24) described 24 patients with proliferative glomerulonephritis and M. pneumoniae infection of whom 6 were children with pneumonitis.

M. pneumoniae infection is a self limiting disease. In untreated M. pneumoniae infection the constitutional symptoms like fever, headache and malaise resolve in about 10 days. Manifestation like cough and rales resolve more slowly. Antibiotic treatment is believed to result in a reduction of the duration of the symptoms. Six of 21 patients had prior antibiotic use before admission to the hospital. All patients received second generation cephalosporin for at least 24 hours after hospitalization. After determination of IgM positivity to M. pneumoniae, initial treatment was changed to macrolid. No significant complication was observed during the treatment.

Early identification of the pathogen and treatment improves the outcome of the pneumonia and reduces the associated mortality and morbidity.

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