Mycoplasma pneumoniae Community-Acquired Pneumonia at Three Hospitals in Bangkok

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Abstract

Background : *Mycoplasma pneumoniae* is one of the common causes of community-acquired pneumonia (CAP) in children and young adults. In Thailand, there has been no prospective study to evaluate the prevalence, clinical features and laboratory findings of *M. pneumoniae* in adult patients with CAP.

Method : The authors prospectively investigated the cause of CAP in adult patients at three general hospitals from September 1998 to August 1999. Paired sera were tested for *M. pneumoniae* infection by using particle agglutination and definite diagnosis was based on a fourfold increase in antibody titer.

Results : Seventeen (21.3%) of 80 patients had pneumonia due to *M. pneumoniae*. Mean age was 28.3 years old (range 18-40). The most common clinical manifestations were cough (100% of cases), fever (82.4% of cases), and headache (47% of cases). Eighty-eight per cent of these patients were classified as class I category, according to the ATS guideline. All patients had a white blood cell count between 4,000-12,000 cells/mm^3. In addition, the common radiographic manifestations were alveolar shadowing (53%), and mixed alveolar and interstitial shadowing (29.4%). Sixteen cases (94%) were treated with the appropriate antibiotic and all patients survived without complication.

Conclusion : These findings suggest that *M. pneumoniae* is a common cause of CAP in Bangkok, Thailand. This type of pneumonia usually occurs in young adults and can usually be treated as ambulatory patients.

Key word : *Mycoplasma pneumoniae*, Community-Acquired Pneumonia

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Mycoplasma pneumoniae is a common cause of community-acquired pneumonia (CAP) occurring primarily in children and young adults[1]. It has been estimated that only 3 to 10 per cent of patients with *M. pneumoniae* respiratory tract infection developed pneumonia[2], however, up to 30 per cent of CAP in the general population was caused by *M. pneumoniae*[2-5]. Although the clinical course of *M. pneumoniae* pneumonia is often mild and self-limiting, it may be complicated by massive pleural effusion, pulmonary fibrosis, bronchiolitis obliterans and acute respiratory distress syndrome. In Thailand, the definite *M. pneumoniae* was first reported in 1980 [6], nevertheless, data of *M. pneumoniae* are still lacking. Therefore, the authors developed a prospective study with the aim of establishing prevalence, clinical features and laboratory findings of *M. pneumoniae* infection in adult patients with CAP.

PATIENTS AND METHOD

Patients

This prospective study was done at three participating hospitals (Phramongkutklao Hospital, Deja Hospital and Bangkok-Prapradang Hospital) from September 1998 to August 1999. The study populations, ambulatory and hospitalized patients, with a diagnosis of CAP made by a physician were recruited within 24 hours of presentation. Inclusion criteria of the study were adapted from those used by Fang et al as follows[7]: (a) adult patients more than 15 years of age (b) a new pulmonary infiltration on the chest radiograph obtained within 24 hours of presentation, and (c) confirmatory clinical findings of one major criterion of either cough, sputum production, or temperature more than 37.8°C, or two minor criteria of pleuritic chest pain, dyspnea, altered mental status, pulmonary consolidation by physical examination, or white blood cell count of more than 12,000 cell/mm^3. Patients who were transferred from another hospital or hospitalized within 3 weeks before admission were excluded. Patients were also excluded if chest roentgenograms did not reveal a new infiltration or if radiographic abnormalities were attributable to a noninfectious etiology.

Data collections

The following parameters including age, gender, smoking habit, comorbid diseases and clinical symptoms and signs were recorded at the first visit. The severity of CAP was classified according to ATS guidelines as follows; class 1: age <60 years without comorbidity, class 2: CAP with comorbidity and/or age >60 years, Class 3: hospitalized patients, class 4: severe CAP[8]. Cough was classified as mild, moderate and severe. Cough with no significant interference with normal activities, significant interference with normal activities and limiting normal activities were mild, moderate and severe cough, respectively.

Method

Serum samples were obtained at the time of enrollment and at 4-6 weeks at the follow-up appointment. All serum samples were separated immediately and stored at -30°C until tested. Particle agglutination was the test for *M. pneumoniae* by using Serodia-Myco II (Fujirebio, Japan)[9]. The definite diagnosis of acute *M. pneumoniae* infection was based on a fourfold increase in antibody titer (to ≥1 : 160)[9].

Serial chest roentgenograms were obtained at 4 weeks at the follow-up appointment. All chest radiographs were reviewed and interpreted by radiologists. Abnormalities on the chest radiograph were classified as follows: alveolar infiltrates, interstitial infiltrates, mixed alveolar and interstitial infiltrates, and pleural effusion.

RESULTS

Eighty patients (48 outpatients/32 inpatients) were enrolled in this study. Seventeen of the 80 (21.3%) patients showed evidence of acute *M. pneumoniae* infection. Patients' characteristics, clinical presentation and comorbid diseases of 17 cases are summarized in Table 1. The mean age of the cases was 28.3 years with a range of 18 to 40. Most of the patients had previously been healthy. Only one case had pulmonary agenesis. The mean duration of symptoms prior to visiting a physician was 6.6 days. Of the 17 cases, 15 and 2 patients were classified as ATS class 1 and ATS class 3, respectively. In general, the most common clinical manifestations were cough (100%, productive in 58.8%), fever (82.4%), headache (47%), and chest pain (41.2%). It was found that 10 of 17 (58.8%) patients had severe cough, which limited normal activity. Chest auscultation revealed pneumonic rale in 76.4 per cent of the cases followed by bronchial breath sound (23.5%), wheezing (11.8%), and decreased breath sound (11.8%). One patient showed cervical lymphadenopathy and did not keep the follow-up appointment. All patients had a white blood cell (WBC) count between 4,000-12,000 cells/mm^3. Only two (12%) cases had a WBC more

Table 1. Characteristics of 17 patients with CAP due to *M. pneumoniae*.

Characteristic	No of patients	%
Demographic		
Sex (male/female)	5/12	29.4/70.6
Age, mean ± SD (range)	28.3 ± 7.0	18-40
Comorbidity	1	5.9
Current cigarette smoker	4	23.5
Outpatient/inpatient	15/2	88.2/11.8
Symptom		
Fever (≥37.8°C)	14	82.4
Cough	17	100
Mild	2	11.8
Moderate	5	29.4
Severe	10	58.8
Productive cough	10	58.8
Shortness of breath	5	29.4
Headache	8	47
Chest pain	7	41.2
Sore throat	3	17.6
Physical examination		
Normal	2	11.8
Crackle	13	76.4
Bronchial breath sound	4	23.5
Wheezing	2	11.8
Decreased breath sound	2	11.8
Lymphadenopathy	1	5.9
Severity		
ATS class 1	15	88.2
ATS class 3	2	11.8

Table 2. Radiographic patterns of the patients with *M. pneumoniae* pneumonia.

Patterns	Number of Patients	%
Alveolar	9	53
Lobar consolidation	4	23.5
Interstitial	3	17.6
Mixed alveolar & Interstitial	5	29.4
Multilobar infiltrates (≥2 lobes)	5	29.4
Bilateral infiltrates	2	11.8
Pleural effusion	3	17.6
Unilateral	2	11.8
Bilateral	1	5.9

than 10,000 cells/mm^3. Sixteen of the 17 cases (94%) were treated with the appropriate antibiotic which consisted of sparfloxacin (41.2%), levofloxacin (5.9%), erythromycin (11.8%), roxithromycin (5.9%), doxycycline (5.9%), and combination of erythromycin and amoxicillin/clavulanic acid (23.5%). Only one case received amoxicillin. All patients survived without complication or extrapulmonary involvement.

The most common radiographic manifestation was alveolar shadowing that was found in 9 of 17 (53%) cases (Table 2). Interstitial and mixed alveolar/interstitial shadowing was found in 3 of 17 (17.6%) and 5 of 17 (29.4%) cases, respectively. It five (29.4%) cases more than one lobe was involved. Three of 17 patients (17.6%) had evidence of pleural effusion which disappeared after receiving the appropriate antibiotic. The follow-up chest radiograph revealed that the pneumonic foci of 11 (65%) cases had disappeared and the others had more than fifty per cent improvement.

DISCUSSION

M. pneumoniae is a well-recognized and common pathogen of CAP. The spectrum of disease following infection ranges from asymptomatic in 25 per cent of infected individuals, through mild upper respiratory tract symptoms to pneumonia, which develops in 3-10 per cent of infected patients[2]. Prevalence of *M. pneumoniae* as a cause of CAP has ranged from 5-29 per cent in various studies[3-5]. In the present study, *M. pneumoniae* was identified in 21.3 per cent of the enrolled patients. Most of the cases were healthy, young and ambulatory patients. This is similar to previous reports in which *M. pneumoniae* was the common organism[3,4]. There could be many reasons for this high infection rate. Firstly, paired sera were used as a diagnostic tool for infection and this has been shown to improve the diagnostic yield. Secondly, this type of pneumonia occurs predominantly in young adults[1] and can usually be treated at home[10] as in the presented patients. Finally, the local epidemiological factors may contribute to a higher infection rate.

Many *M. pneumoniae* infections are asymptomatic. When presented, the signs and symptoms vary according to the stage of illness[11]. The illness has a gradual onset and is usually heralded by headache, malaise, and low-grade fever[2,11-13]. In the present study, the most common clinical manifestations were cough, fever, headache, and chest pain. No extrapulmonary involvement was manifested in the presented patients. The frequency of these extrapulmonary manifestations varies greatly from one report to another and is much less common when viewed as part of a prospective epidemiologic study rather than as the sum of isolated case reports[2,12]. The results of the white cell count in the present study were usually normal. The most common radiographic findings are alveolar shadowing and mixed

infiltration. Significant pleural effusion was discovered on the standard chest X-ray in 17.6 per cent of the presented cases. A similar finding was found in previous reports[14,15]. The results suggested that patients with CAP due to *M. pneumoniae* had characteristics similar to those of patients with pneumonia caused by other pathogens. In recent studies, there were no clinical features, including basis of clinical, radiological, or routine laboratory tests, which could distinguish *M. pneumoniae* pneumonia from non-*M. pneumoniae* pneumonia[12,16].

Although no signs or symptoms appear to be unique to *M. pneumoniae* pneumonia, several conclusions may be made from the present results as well as previous reports[1,10-13,16]. 1) A subacute course is common, 2) this type of pneumonia usually occurs in young adults, 3) most patients had mild disease severity which was easy to treat as ambulatory patients, and 4) alveolar shadowing is usually found on chest radiography. Since *Mycoplasma* pneumonia is one of the most common causes of CAP in Thailand, the authors suggest that empirical treatment with macrolides or new fluoroquinolones are important in adult patients with CAP.

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มัยโคพลาสม่า นิวโมนิอี ในผู้ป่วยโรคปอดบวมที่เกิดในชุมชน ที่โรงพยาบาล 3 แห่ง ในกรุงเทพมหานคร

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บทนำ : เชื้อ*มัยโคพลาสม่า นิวโมนิอี* เป็นสาเหตุที่พบบ่อยของโรคปอดบวมที่เกิดในชุมชน พบมากในเด็กและวัยรุ่น ปัจจุบันยังไม่มีการศึกษาถึงความชุก อาการทางคลินิกของเชื้อ*มัยโคพลาสม่า นิวโมนิอี* ที่ทำให้เกิดโรคปอดบวมที่เกิดในชุมชน

วิธีการศึกษา : ได้ศึกษาผู้ป่วยโรคปอดบวมที่เกิดในชุมชน ที่ โรงพยาบาลพระมงกุฎเกล้า โรงพยาบาลเดชา และโรงพยาบาลกรุงเทพ-พระประแดง ตั้งแต่เดือนกันยายน 2541 ถึงเดือนสิงหาคม 2542 โดยนำซีรั่มของผู้ป่วยไปตรวจแอนติ-บอดี้ ด้วยวิธี particle aggulation เกณฑ์การวินิจฉัยการติดเชื้อ*มัยโคพลาสม่า*คือมีการเพิ่มแอนติบอดี้ต่อเชื้อ*มัยโคพลาสม่า* มากกว่าหรือเท่ากับ 4 เท่า

ผลการศึกษา : จากผู้ป่วย 80 ราย พบว่า 17 ราย (21.30 เปอร์เซ็นต์) เป็นโรคปอดบวมจากเชื้อ*มัยโคพลาสม่า นิวโมนิอี* อายุเฉลี่ย 28.3 ปี (18-40) อาการที่พบมากที่สุดคืออาการไอ (100 เปอร์เซ็นต์) ไข้ (82.4 เปอร์เซ็นต์) และปวดศีรษะ (47 เปอร์เซ็นต์) 88 เปอร์เซ็นต์ของผู้ป่วย จัดอยู่ใน ATS class 1 ผู้ป่วยทุกรายมีเม็ดเลือดขาวอยู่ระหว่าง 4,000-12,000 เซล/ลบ.ซม. นอกจากนั้นภาพรังสีทรวงอกที่พบมากที่สุดคือ alveolar shadowing (53 เปอร์เซ็นต์), mixed alveolar และ interstitial shadowing (29.4 เปอร์เซ็นต์) ผู้ป่วย 16 ราย (94 เปอร์เซ็นต์) ได้รับยาปฏิชีวนะที่เหมาะสม และทุกรายรอดชีวิตโดยไม่มีข้อแทรกซ้อน

สรุป : ในประเทศไทยเชื้อ*มัยโคพลาสม่า นิวโมนิอี* พบบ่อยว่าเป็นสาเหตุของโรคปอดบวมที่เกิดในชุมชน ส่วนใหญ่พบผู้ป่วยในวัยรุ่น และได้รับการรักษาแบบผู้ป่วยนอกโรงพยาบาล

คำสำคัญ : เชื้อ*มัยโคพลาสม่า นิวโมนิอี*, โรคปอดบวมที่เกิดในชุมชน

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