

***Mycoplasma pneumoniae* infections in children presenting with central nervous system manifestations**

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(Key words: *Mycoplasma pneumoniae*, meningitis, encephalitis, particle agglutination)

Abstract

Objectives To study the incidence of *Mycoplasma pneumoniae* infection among children presenting with central nervous system (CNS) manifestations.

Design Prospective study.

Setting University Paediatric Unit, Teaching Hospital, Karapitiya.

Method Children above 1 year of age, presenting with features of CNS infection, from January to December 2001, were included. Serum samples were tested for *Mycoplasma pneumoniae* infection by using particle agglutination test in addition to the usual laboratory tests. The conventional management protocols for CNS infections were carried out. Anti mycoplasma therapy was started once the diagnosis of *Mycoplasma pneumoniae* infection was established.

Results *Mycoplasma pneumoniae* infection was established in 8 of 35 children presenting with CNS manifestations. Their age range was 2-12 years. Five had meningoencephalitis and 3 had encephalitis. Mycoplasma antibody titres ranged from 160 to 5,120.

Conclusions *Mycoplasma pneumoniae* is an important association in children with meningoencephalitis or encephalitis.

Introduction

Mycoplasma pneumoniae characteristically causes respiratory tract infections in both children and adults^{1,2}. It is a well known agent for atypical pneumonia. However, infections in central nervous system (CNS), hepatobiliary system and

cardiovascular system are reported^{3,4,5}. Aseptic meningitis, encephalitis, meningoencephalitis, acute cerebellitis, Guillain-Barré Syndrome, acute hemiplegia and acute transverse myelitis are some of the CNS manifestations associated with *Mycoplasma pneumoniae* infection^{6,7,8}. Early diagnosis of some of these infections would prevent serious consequences⁹.

Clinical presentation of meningitis or meningoencephalitis caused by *Mycoplasma pneumoniae* is similar to that of other bacterial or viral agents. Fever, headache, vomiting photophobia, neck stiffness, positive Kernig sign and alteration of level of consciousness are the main features. Onset of symptoms is more insidious than in the other infections. Early diagnosis is very important in preventing serious complications. Hence blood for serology or gene probe technique, if facilities are available, should be performed once suspicion is aroused. Particle agglutination test is widely used in the diagnosis of an acute infection. It has 100% sensitivity and 95% specificity¹⁰.

Method

A prospective study was carried out in the university paediatric unit, Teaching Hospital, Karapitiya from January to December 2001, on children above 1 year of age, presenting with features of CNS infection, to find out the incidence of *Mycoplasma pneumoniae* among these patients.

Blood for mycoplasma antibody titre was taken along with blood culture, white cell count, erythrocyte sedimentation rate (ESR) and serum for virology (including Japanese encephalitis). Lumbar punctures were not done during the acute stage and cerebrospinal fluid (CSF) analysis was done around 3rd to 5th day. Particle agglutination test for *Mycoplasma pneumoniae* was done at the Department of Microbiology, Faculty of Medicine, Galle. With this test a titre of 80 or more was

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considered as diagnostic of mycoplasma infection. Mycoplasma antibody titre of the CSF was not done as facilities were not available. Conventional management protocols for CNS infections were carried out until mycoplasma infection was established when anti mycoplasma therapy was started.

Informed consent was obtained from the parents. Ethical approval was obtained from the Ethics Committee, Faculty of Medicine, Galle.

Results

Fever, signs of meningeal irritation and alteration of level of consciousness were found in 35 patients (23 boys, 12 girls). 19 of these patients had features of meningoencephalitis, 10 of meningitis and 6 of encephalitis without meningitis. Headache was found in 24 patients,

vomiting in 20 and photophobia in 14 patients. Diagnosis of *Mycoplasma pneumoniae* infection was established in 8 patients (5 boys, 3 girls). Five of the eight patients had meningoencephalitis and the other three had encephalitis. Mycoplasma antibody titres ranged from 160 to 5120. Mycoplasma antibody test results were available by 4th day after admission in most instances. Then the CNS treatment protocol was stopped and only the anti mycoplasma therapy was continued except in 3 cases who were very ill on admission in whom both conventional therapy and anti mycoplasmal therapy were continued for the full length of time. Seven patients were seen between November to April which is the period where the incidence of *Mycoplasma pneumoniae* infection is high according to my experience (Table 1).

Table 1
Description of *Mycoplasma pneumoniae* positive patients.

Patient Index	Age	Sex	Month of presentation	Cerebrospinal fluid analysis	Diagnosis	Mycoplasma antibody titre
1	12	F	January	Protein 20g/dl Lymphocytes 00 Polymorphs 00	Encephalitis	160
2	8	F	January	Protein 60g/dl Lymphocytes 20 Polymorphs 06	Meningoencephalitis	320
3	9	M	January	Protein 60g/dl Lymphocytes 35 Polymorphs 60	Meningoencephalitis	640
4	6	M	February	Protein 40g/dl Lymphocytes 18 Polymorphs 02	Meningoencephalitis	160
5	6	M	February	Protein 60g/dl Lymphocytes 35 Polymorphs 140	Meningoencephalitis	640
6	8	M	May	Protein 60g/dl Lymphocytes 16 Polymorphs 20	Meningoencephalitis	640
7	2	M	November	Protein 20g/dl Lymphocytes 00 Polymorphs 01	Encephalitis	640
8	4.5	F	December	Protein 30g/dl Lymphocytes 00 Polymorphs 00	Encephalitis	5120

Blood cultures were negative in all the patients studied and CSF cultures were also negative for bacterial infections. This could be due to administration of antimeningitic therapy before doing a lumbar puncture. Viral studies, including Japanese encephalitis serology, were negative in 6 of the *Mycoplasma pneumoniae* positive patients. Results could not be traced in the other 2 patients.

Discussion

CNS manifestations appear in 1 per 1000 patients with *Mycoplasma pneumoniae* infections¹¹. Encephalitis is the most frequent manifestation but meningitis, myelitis, polyradiculitis, acute cerebellitis and Guillain-Barré Syndrome have also been reported. Very rarely it can cause brain stem encephalitis¹². Onset of these manifestations is usually acute with lowered consciousness, convulsions, pareses and other neurological signs. Severe and even fatal cases have been reported.

In our study 8 out of 35 patients with CNS manifestations had an established *Mycoplasma pneumoniae* infection. Majority of them had meningoencephalitis. The pathophysiology of CNS manifestations of *Mycoplasma pneumoniae* is unknown. *Mycoplasma pneumoniae* has never been isolated from the brain tissue, but it has been recovered from CSF specimens in some cases. Biochemical and CSF findings are similar to that of meningoencephalitis.

The author has observed that *Mycoplasma pneumoniae* pneumonia has an increased incidence during the period from November to April. A similar pattern was observed with *Mycoplasma pneumoniae* associated CNS infections too. It is important to suspect the possibility of *Mycoplasma pneumoniae* infection in any child with symptoms of CNS infection, especially in those who are above 4 years of age.

Conclusions and recommendations

- *Mycoplasma pneumoniae* is an important association and possible causative agent of CNS infections such as meningoencephalitis and encephalitis.
- Mycoplasma antibody tests are recommended in children with CNS infections in addition to conventional laboratory tests.

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