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Editorial
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Neurological Complication Caused by *Mycoplasma pneumoniae* Infection: A Case Series

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Editorial

Mycoplasmas are the smallest prokaryotic microbes present in nature. At present, seven species of *Mycoplasma* have been found to be pathogenic to humans, including *M. pneumoniae*, *M. urealytium*, *M. genitalium*, *M. hominis*, *M. fermentation*, *M. penetrans*, and *M. pirum*. *M. pneumoniae* plays an important role in the etiology of respiratory tract infections in all pediatric ages. In the pre-school period, *M. pneumoniae* infections are often asymptomatic or affect the upper airways, whereas during the school age period, primary atypical pneumonia shows a higher prevalence. Airway disease presents a generally benign and rapid evolution. It is less often characterized by peculiar and/or severe evolution such as fulminant pneumonia, lung abscess, pneumatocele, extended lobar hepatisation, or by association with other lung diseases (chronic obstructive broncho pneumopathies and asthma). Nevertheless *M. pneumoniae* can also give rise to extra-pulmonary diseases with or without respiratory involvement. A lot of unusual clinical manifestations, involving different systems and organs such as the central and peripheral nervous system, joints, skin and mucosa, blood, and gastrointestinal and cardiovascular systems, have been reported in the literature. These extra pulmonary diseases may be a result of the presence of the pathogen in the target organ or organ system but the paucity of reports on isolation of *M. pneumoniae* from tissues or body fluids such as skin eruptions and CNS involvement would favor the hypothesis of an indirect effect of the microorganism in most cases. So far, however, no neurotoxin has been demonstrated for this *Mycoplasma*. In several cases, a tendency for hyper coagulation has been reported that is induced either directly or indirectly by the bacterium and intravascular clotting cannot be excluded as a pathogenic mechanism. Furthermore, the possibility of an indirect immune mechanism has been advanced in patients with *M. pneumoniae* infection as autoimmunity or by formation of immune complexes. The pathogenesis of extra pulmonary manifestations has not been fully elucidated, but the relatively high frequency and concurrence with the infection during major outbreaks indicate that these extra pulmonary symptoms are true manifestations of M. pneumoniae disease. Neurological complications are the most frequently ones reported in the literature with estimates ranging from 13% to 25% or >30%; muscular-articular manifestations account for 30% to 40% of cases. The timely recognition of unusual and/or severe features due to *M. pneumoniae* based on clinical and epidemiological data is essential in severe cases because this can prompt early specific treatment that is crucial to the successful disease outcome. However laboratory testing is required for confirmation even if it results often inaccurate and false negative for a long period of time. The utility of *M. pneumoniae* IgM antibodies varies with age; it is usually positive in acute infection and remains so for months but also may be negative in the course of acute infection. *M. pneumoniae* isolation is difficult since *M. pneumoniae* cultures have low sensitivity; today the direct diagnosis of *M. pneumoniae* via DNA identified using the polymerase chain reaction provides a highly specific and sensitive test. Treatment of extra pulmonary manifestations remains partly controversial. Concomitant use of immunomodulators such as corticosteroids or immunoglobulins with antibiotics effective against M. pneumoniae can be considered as treatment modalities for the most severe cases such as those with neurological complications. Plasma exchange has also been reported and seems to be beneficial.

Extrapulmonary complications of *Mycoplasma pneumoniae* (*M. pneumoniae*) infection include encephalitis, optic neuritis, acute psychosis, stroke, cranial nerve palsies, and aseptic meningitis and

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also it may be implicated in immune mediated neurological diseases such as acute demyelinating encephalomyelitis, Guillain-Barre syndrome and variants, and transverse myelitis.

We present ten cases with acute neurological diseases after *M. pneumoniae* infection. The clinical presentations were characterized by encephalitis in 4 patients, Guillain-Barre syndrome in 3 patients, Grisel syndrome in 1 patient, ADEM 2. *M. pneumoniae* infection was detected in serum by serological method. Only 4 patients had respiratory symptoms preceding *M. pneumoniae* infection. Brain MRI revealed hyperintensities on corpus striatum and mesencephalon in one patient with encephalitis, the other had front parietal coalescent periventricular white matter lesions on T2 images. The patient with transverse myelitis had cervical, dorsal and lumbar scattered hyperintense lesions on T2 images. Two patients were treated with high dose steroid, one with antibiotic; the other 7 patients received treatment with intravenous immune globulin.

M. pneumoniae may reveal different neurologic complications with different radiologic findings. Extrapulmonary complications of *Mycoplasma pneumoniae* (*M. pneumoniae*) infection include encephalitis, optic neuritis, acute psychosis, stroke, cranial nerve palsies, and aseptic meningitis and also it may be implicated in immune mediated neurological diseases such as acute demyelinating encephalomyelitis, Guillain-Barre syndrome and transverse myelitis.

Mycoplasma pneumoniae (M. pneumonia) is one of the important causes of upper and/or lower respiratory tract infections during childhood. Central Nervous System (CNS) related findings and complications are most commonly seen and have been described in patients with *M. pneumoniae* infections. Patients suffering *M. pneumoniae* infection may have varying degrees of neurological complications at a ratio of approximately 6% to 7%. Neurological manifestations include encephalitis, transverse myelitis, Acute Disseminated Encephalomyelitis (ADEM), Guillain-Barre syndrome, and thromboembolic stroke. The time period between the onset of respiratory symptoms and neurological symptoms varies 2 to 14 days. More than 80% of patients with CNS findings have concomitant respiratory infection.