Studies on *Mycoplasma pneumoniae* infections among patients with respiratory illness in Sri Lanka

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August 2007

V. ABSTRACT

Mycoplasmas represent the smallest self-replicating organisms known on the planet. *Mycoplasma pneumoniae* is the most important human mycoplasma pathogen causing a range of respiratory tract infections including pneumonia. *M. pneumoniae* causes 50% of primary atypical pneumonia, contributing to 15-20% of community acquired pneumonia (CAP). Apart from pulmonary involvement, it is associated with a range of extra pulmonary manifestations namely; encephalitis, cerebellar syndrome, aseptic meningitis, erythematous / maculopapular rashes, arthralgias, polyarthropathies, myocarditis, pancreatitis, haemolytic anaemia, glomerulonephritis, conjunctivitis etc. As *M. pneumoniae* does not have a cell wall like bacteria, the conventional treatment (e.g. penicillins) for CAP is not effective. Hence there is a need for prompt and correct diagnosis for effective treatment. As the diagnosis relies on laboratory tests, these may take time. Therefore empirical therapy that is guided by the prevalence data of the particular locality may facilitate treatment.

This study was carried out at the North Colombo Teaching Hospital, Ragama and the chest hospital, Welisara during the period from September 2003 to August 2004. The study was to determine the prevalence of *M. pneumoniae* infection among patients with respiratory tract infections - particularly in three patient groups (pneumonia, acute bronchitis, sore throat) and a control group. Each group consisted of 200 patients. Paired serum samples were obtained from each group for serology antibody tests using *M. pneumoniae* specific Enzyme-Linked Immunosorbent Assay (ELISA) (isotype specific) and Cold Agglutinin Test (CAT). Respiratory samples from each individual were used for detection of *M. pneumoniae* DNA. Serologically

confirmed cases of *M. pneumoniae* with age and gender were matched with serologically negative group of patients selected for *M. pneumoniae* DNA PCR. CAT was performed only for patients with pneumonia in the acute stage.

The prevalence of *M. pneumoniae* infection by antibody test was 15.5%, 6.6% and 1.2% in patients with pneumonia, acute bronchitis and sore throat respectively. *M. pneumoniae* DNA was detected in 52% of serology confirmed cases and 15 % of serology negative cases. CAT was positive in 20% of serology positive patients and 20% of serology negative patients. Isotype specific antibody assays are helpful for extended diagnosis. Detection of specific IgM in one sample enabled diagnosis but paired sera was necessary to demonstrate seroconversion when testing for specific IgG. In the study, IgA was shown to be a better indicator of severe infection as this antibody class was observed only in patients with pneumonia. However, specific IgA detection showed low sensitivity.

PCR was available to diagnose 15% (4/26) serologically negative patients but it missed serologically positive patients. The combination of antibody serology and PCR detection for *M. pneumoniae* DNA enabled effective laboratory diagnosis in the clinical setting. The CAT was found to offer no distinct advantage and was no longer recommended even as a bed side screening test due to its poor sensitivity and specificity.

In the treatment of pneumonia, the decision on empirical antibiotic regime needs to consider the prevalence rate (15.5%) of most common atypical bacterium *M. pneumoniae* in Sri Lanka.