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Characterization of Mycoplasma Pneumoniae Causing Exacerbation of Asthma: A Prototypical Finding from Sri Lanka

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Abstract : M. pneumoniae has been identified as an etiology for exacerbation of asthma (EQA), although viruses play a major role in EOA. M. pneumoniae infection is treated empirically with macrolides, and its antibiotic sensitivity is not detected routinely. Characterization of the organism by genotyping and determination of macrolide resistance is important epidemiologically as it guides the empiric antibiotic treatment. To date, there is no such characterization of M. pneumoniae performed in Sri Lanka. The present study describes the characterization of M. pneumoniae detected from a child with EOA following a screening of 100 children with EOA. Of the hundred children with EOA, M. pneumoniae was identified only in one child by Real-Time polymerase chain reaction (PCR) test for identifying the community-acquired respiratory distress syndrome (CARDS) toxin nucleotide sequences. The M. pneumoniae identified from this patient underwent detection of macrolide resistance via conventional PCR, amplifying and sequencing the region of the 23S rDNA gene that contains single nucleotide polymorphisms that confer resistance. Genotyping of the isolate was performed via nested Multilocus Sequence Typing (MLST) in which eight (8) housekeeping genes (ppa, pgm, gyrB, gmk, glyA, atpA, arcC, and adk) were amplified via nested PCR followed by gene sequencing and analysis. As per MLST analysis, the M. pneumoniae was identified as sequence type 14 (ST14), and no mutations that confer resistance were detected. Resistance to macrolides in M. pneumoniae is an increasing problem globally. Establishing surveillance systems is the key to informing local prescriptions. In the absence of local surveillance data, antibiotics are started empirically. If the relevant microbiological samples are not obtained before antibiotic therapy, as in most occasions in children, the course of antibiotic is completed without a microbiological diagnosis. This happens more frequently in therapy for M. pneumoniae which is treated with a macrolide in most patients. Hence, it is important to understand the macrolide sensitivity of M. pneumoniae in the setting. The M. pneumoniae detected in the present study was macrolide sensitive. Further studies are needed to examine a larger dataset in Sri Lanka to determine macrolide resistance levels to inform the use of macrolides in children with EOA. The MLST type varies in different geographical settings, and it also provides a clue to the existence of macrolide resistance. The present study enhances the database of the global distribution of different genotypes of M. pneumoniae as this is the first such characterization performed with the increased number of samples to determine macrolide resistance level in Sri Lanka. M. pneumoniae detected from a child with exacerbation of asthma in Sri Lanka was characterized as ST14 by MLST and no mutations that confer resistance were detected.

Keywords : mycoplasma pneumoniae, Sri Lanka, characterization, macrolide resistance
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