

Macrolide-resistant *Mycoplasma pneumoniae* in adults with community acquired pneumonia: challenges and risks

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Citation: Hakamifard A; Saffaei A. Macrolide resistant *Mycoplasma pneumoniae* in adults with community acquired pneumonia: challenges and risks. East Mediterr Health J. 2020;26(2):141–142 <https://doi.org/10.26719/2020.26.2.141>

Received: 01/11/19; accepted: 31/12/19

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Sir,

Mycoplasma pneumoniae is an important atypical microorganism that causes community-acquired pneumonia (1). These atypical microorganisms are responsible for 7–20% of community-acquired pneumonia cases, yet β -lactam agents are not effective against *M. pneumoniae* because it lacks a rigid cell wall. Currently, macrolides are considered as first line agents to treat atypical community-acquired pneumonia due to *M. pneumoniae*, while respiratory fluoroquinolones (such as levofloxacin), and tetracyclines are alternative treatment options (2). However, macrolide-resistant *M. pneumoniae* is growing globally and the prevalence rate shows variations across countries and regions. Epidemiologic studies have shown that the macrolide-resistant *M. pneumoniae* rate is between 0% and 15% in the United States of America, while reaching 100% in Asia, with resistance more dominant in low and middle-income countries (3).

Moreover, for some countries there has been little or no macrolide-resistant *M. pneumoniae* reporting, including the Islamic Republic of Iran, where studies determining the prevalence of community-acquired pneumonia due to *M. pneumoniae* and macrolide-resistant *M. pneumoniae* incidence remain scarce. Research by Arfaatabar et al. indicated that the frequency of *M. pneumoniae* among patients with atypical community-acquired pneumonia was reported to be high (4). Study by Noori et al. estimated the macrolide-resistant *M. pneumoniae* incidence to be almost 57% (5). In clinical practice, characteristics of macrolide-resistant *M. pneumoniae* and macrolide-susceptible *M. pneumoniae* are similar (6). In addition, polymerase chain reaction is not a routine diagnostic method for community-acquired pneumonia in some low and middle-income countries.

Perhaps for these reasons, most physicians are

accustomed to prescribe levofloxacin as the first line empiric regimen in adults with atypical community-acquired pneumonia. Tuberculosis is common in the Region, thus the risk for the emergence of resistance to this valuable antibiotic exists if physicians use this agent inappropriately. Another aspect that is important to be clarified is the clinical relevance of macrolide-resistant *M. pneumoniae* in adults with community-acquired pneumonia. In the study by Cardinale et al. (7), which was done in a paediatric population, authors concluded alternative agents such as fluoroquinolones should be used if symptoms persist or in the case of clinical deterioration. According to another study by Lee et al. (6), the authors suggested that fluoroquinolones may be considered as an alternative agent when patients remain febrile or chest X-ray imaging shows deterioration at least 48–72 hours after macrolide initiation.

Detection of macrolide-resistant *M. pneumoniae* should be considered if patients did not respond to the macrolide regimen (6). However, an important point is to remind that macrolides are bacteriostatic (as opposed to fluoroquinolones that are bactericidal) and breakthrough infection might occur especially in those immunocompromised (8). Therefore, further evidence regarding these challenges is needed in low and middle-income countries. The conduct of well-designed studies to determine the prevalence of community-acquired pneumonia due to *M. pneumoniae* and macrolide-resistant *M. pneumoniae* rate is emphasized. The minimal inhibitory concentration of antibiotics against *M. pneumoniae* can be determined in such studies, which is beneficial for clinical practice. These studies can also aim to assess the fluoroquinolone-resistant *M. pneumoniae* rate in an in-vitro situation, thus improving the selection of an appropriate antibiotic regimen according to in-vitro studies, clinical efficacy and related adverse effects.

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