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Carriage of upper respiratory tract pathogens in rural communities of Sarawak, Malaysian Borneo

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Abstract

Introduction: Pneumonia is a leading cause of death in Malaysia. Whilst many studies have reported the aetiology of pneumonia in Western countries, the epidemiology of pneumonia in Malaysia remains poorly understood. As carriage is a prerequisite for disease, we sought to improve our understanding of the carriage and antimicrobial resistance (AMR) of respiratory tract pathogens in Malaysia. The rural communities of Sarawak are an understudied part of the Malaysian population and were the focus of this study, allowing us to gain a better understanding of bacterial epidemiology in this population.

Methods: A population-based survey of bacterial carriage was undertaken in participants of all ages from rural communities in Sarawak, Malaysia. Nasopharyngeal, nasal, mouth and oropharyngeal swabs were taken. Bacteria were isolated from each swab and identified by culture-based methods and antimicrobial susceptibility testing conducted by disk diffusion or E test.

Results: 140 participants were recruited from five rural communities. *Klebsiella pneumoniae* was most commonly isolated from participants (30.0%), followed by *Staphylococcus aureus* (20.7%), *Streptococcus pneumoniae* (10.7%), *Haemophilus influenzae* (9.3%), *Moraxella catarrhalis* (6.4%), *Pseudomonas aeruginosa* (6.4%) and *Neisseria meningitidis* (5.0%). Of the 21 *S. pneumoniae* isolated, 33.3 and 14.3% were serotypes included in the 13 valent PCV (PCV13) and 10 valent PCV (PCV10) respectively. 33.8% of all species were resistant to at least one antibiotic, however all bacterial species except *S. pneumoniae* were susceptible to at least one type of antibiotic.

Conclusion: To our knowledge, this is the first bacterial carriage study undertaken in East Malaysia. We provide valuable and timely data regarding the epidemiology and AMR of respiratory pathogens commonly associated with pneumonia. Further surveillance in Malaysia is necessary to monitor changes in the carriage prevalence of upper respiratory tract pathogens and the emergence of AMR, particularly as PCV is added to the National Immunisation Programme (NIP).

Keywords: Carriage, Pneumonia, Malaysia, Pathogen, Respiratory, AMR

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