

Abstract

Antimicrobial resistance patterns of colonizing *Escherichia coli* and *Klebsiella pneumoniae* from urine samples of pregnant women in a rural community in Sri Lanka

Introduction: Antimicrobial resistance (AMR) in bacteria, causing common community-acquired infections, is gradually increasing worldwide and has a major impact on mortality, morbidity and treatment costs. Asymptomatic gut colonization with these resistant bacteria acts as a reservoir for the spread of AMR in the community. Most of the AMR data available are related to hospital-based settings and may not represent AMR rates at the community level. This research aims to fill the gaps of community-related AMR data.

Objectives:

General objective

To assess the antibiotic resistance patterns of colonizing *Escherichia coli* and *Klebsiella pneumoniae* from urine samples of pregnant women as an indicator for antimicrobial resistance in the healthy population in a rural community in Sri Lanka.

Specific objectives

To determine the antibiotic resistance patterns of colonizing *Escherichia coli* and *Klebsiella pneumoniae*.

To determine the Extended-spectrum beta-lactamases (ESBL) and Carbapenemase (CP) production prevalence in the colonizing *Escherichia coli* and *Klebsiella pneumoniae* in a healthy population.

To describe the factors associated with the AMR Enterobacteriaceae colonization

Method: In this descriptive cross-sectional study, urine samples were collected from pregnant women attending to antenatal clinics in two medical officer of health (MOH) areas in Kalutara district. Urine samples were cultured using the semiquantitative

method. *E. coli* and *K. pneumoniae* isolates with $<10^3 - 10^5$ CFU/ml, were further processed for antibiotic sensitivity testing, according to the Clinical and Laboratory Standard Institute method. Combined disc method was used to detect ESBL production.

Results: A total of 252 pregnant women were included in the study. A total of 69 isolates were identified, comprising 31 (44.9%) *E. coli* and 38 (55.1%) *K. pneumoniae*. Of these 63 (91.3%) isolates showed resistance to at least one antibiotic from the tested antibiotic panel. ESBL producers were recovered from the urine of 5.2% (13, n=252) women. Multi-drug resistance (MDR) was identified in 8.7% (6, n=69) of isolates. There were no isolates with carbapenem resistance. None of the studied factors were significantly associated with ESBL production.

Conclusion: There was a significant proportion of at least one antibiotic-resistance with notable ESBL prevalence of 5.2%, emphasizing the growing concerns of community-related AMR. Although carbapenem resistance was not detected, the presence of MDR highlights the importance of vigilant surveillance and timely targeted interventions to prevent AMR.