Fecal Carriage of Carbapenem Resistant *Enterobacterales* and Associated Factors Among Admitted Patients in Saint Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia

Abstract

Purpose: The *Enterobacterales* family colonizes the human gut as normal flora in all age groups, with bacterial infections being the most common cause. Resistance is currently observed in all normal flora. The aim of this study was to determine the frequency of fecal carriage of carbapenem-resistant *Enterobacterales* (CRE), carbapenemase producing *Enterobacterales* (CPE), and associated factors in the faeces of admitted patients.

Methods: A cross-sectional study was conducted in Saint Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia. A total of 384 rectal swabs were collected from various wards in admitted patients who have consented to participate. The specimens were inoculated on a MacConkey agar plate, and then they were incubated at 37 ℃ for 18 to 24 hours. Using the BD Phoenix^{TM} M50 compact system identification and antimicrobial susceptibility testing were performed. Using the modified carbapenem inactivation method, it was determined whether the carbapenem-resistant bacterial isolate produced carbapenemase or not.

Results: Overall prevalence of carbapenem-resistant *Enterobacterales* carriage and carbapenema se producing *Enterobacterales* in admitted patients was 17.2% (95%, Confidence Interval: 13.3-21.1%) and 7% (95%, Confidence Interval: 4.7-9.9%), respectively. The predominate carbapene m-resistant *Enterobacterales* in fecal carriage was *K. pneumoniae*, 15.4% (23/149), *E. cloacae* 1 5.4% (6/39), followed by *E. coli* 12.4% (37/307) of carbapenem-resistant *Enterobacterales* (CRE) isolate. Carbapenem-resistant *Enterobacterales* carriage isolates showed large level of resistance to ciprofloxacin, and sulfamethoxazole-trimethoprim. Prior intake of antibiotics (Odds Ratio 2.42, 95% CI: 11.186-4.95) was significantly associated with higher carbapenem-resistant *Enterobacterales* carriage.

Conclusion: We observed a high prevalence of carbapenem-resistant *Enterobacterales* carriage and carbapenemase-producing *Enterobacterales* among admitted patients. There were only amikacin and colistin that could be effective for carbapenem-resistant *Enterobacterales* isolates.

Hence, the control of carbapenem-resistant *Enterobacterales* carriage should be given priority by carbapenem-resistant *Enterobacterales* screening for fecal of admitted patients, and adhering to good infection prevention practice in hospital settings.

Keywords: Enterobacterales; carbapenem; carbapenemase; carriage; fecal; resistance.