

TITLE: VERY LOW *MCR-1* GENE FREQUENCY IN *ESCHERICHIA COLI* ISOLATES FROM URINARY TRACT INFECTIONS

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ABSTRACT:

Introduction: Colistin is an antibiotic active against Gram negative bacteria including part of the members of the *Enterobacterales* order, *Pseudomonas aeruginosa* and *Acinetobacter*. With the lower rate of development of new antimicrobials and the limited therapeutic options, colistin has been one of the last resort antimicrobials for the treatment of infections caused by carbapenemases-producing gram-negative rods. Colistin resistance can be encoded by chromosome or plasmid-located gene *mcr-1* (Mobile Colistin Resistance) phosphoethanolamine transferase encoded by a plasmid-located gene. The *mcr-1* adds a phosphoethanolamine molecule to the LPS molecules and consequently alters its 'charge, and lowers the colistin binding, turning the bacteria resistant to polymyxins. The main concern about *mcr-1* is the possibility of horizontal gene transfer that could disseminate this resistance mechanism among bacterial populations and increasing colistin resistance rate among carbapenemases producers.

Materials and Methods: In this study, a total of 1,011 *E.coli* clinical isolates of from a private laboratory in São Paulo were analyzed for colistin resistance. Screening for colistin resistance was performed using Mueller-Hinton agar containing colistin (3 mg/L) as previously described. All colistin resistant isolates were subsequently tested by broth microdilution for colistin susceptibility and RT-PCR for the *mcr-1* gene.

Results: In total, 1,011 consecutive *Escherichia coli* urinary isolates were tested for screened for colistin resistance in this study. Only four isolates (0.395%) were resistant to colistin as confirmed by broth microdilution. However, none of the isolates had the *mcr-1* gene. Consequently, in our population, the *mcr-1* rate is lower than 0.099%.

Conclusion: Despite the growing concern about the spread of *mcr-1*, our results suggest that the its' frequency among *E.coli* isolated form outpatient urinary infections is lower than 0.099%.

Keywords: plasmids, colistin, *mcr-1*, carbapenemases producers, urinary isolates.