Molecular Identification of Colistin Resistant Gene *(mcr-1)* Among Carbapenems Resistant Bacteria Causing Urinary Tract Infections

Huzaifa Gulzar

Riphah International University Islamabad Pakistan.

Background

- The occurrence of carbapenem resistance in uro-pathogen and harboring a colistin resistant gene *(mcr-1)* causing bacteria difficult to treat now this is a global health issue.
- Colistin is a last option of antibiotic against carbapenem resistant Enterobacteriaceae. Urinary tract infections are common hygiene problem that impacts a large number of people each year. This study identifies the colistin resistant gene *(mcr-1)* among carbapenem resistance bacteria causing urinary tract infections.

Objective

- The current study designed to investigate carbapenem resistance in Uro-pathogen causing urinary tract infections and molecular identification of colistin resistant gene *(mcr-1)* among them.

Methodology

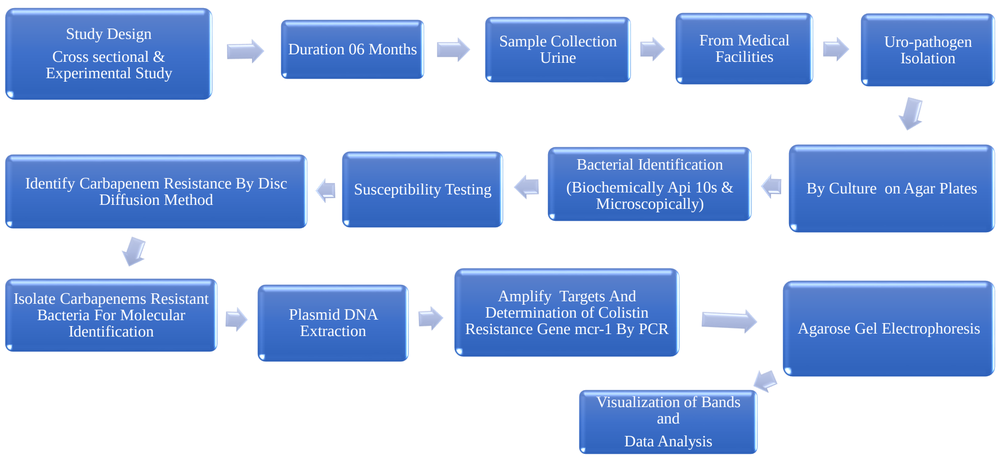


Fig 01: Schematic Diagram

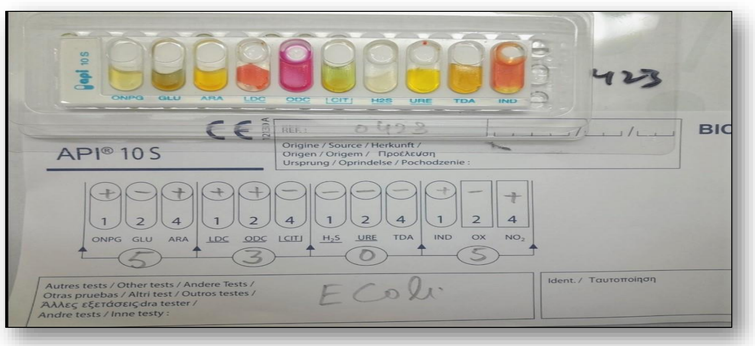
- 

Fig 02: API 10s Analytical Profile Index of *E Coli*

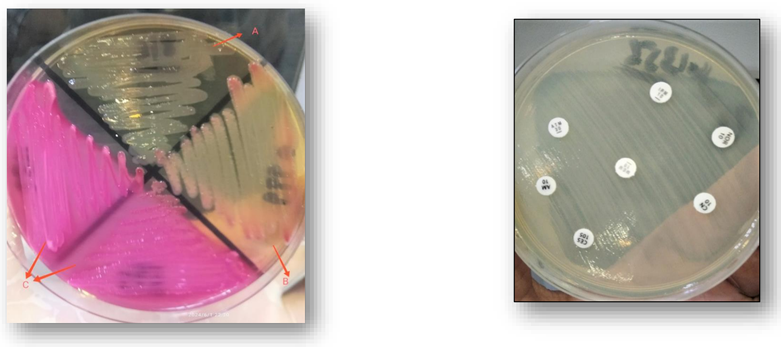
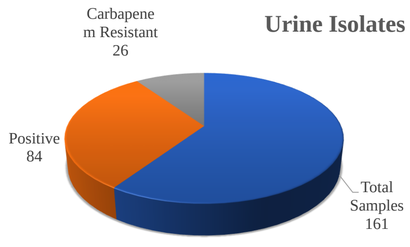
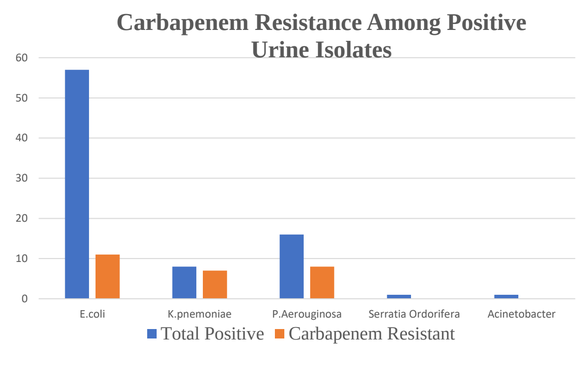


Figure 03: Bacterial Isolates On MacConkey Agar (Left) & (Right) Susceptibility Testing of Bacterial Isolates

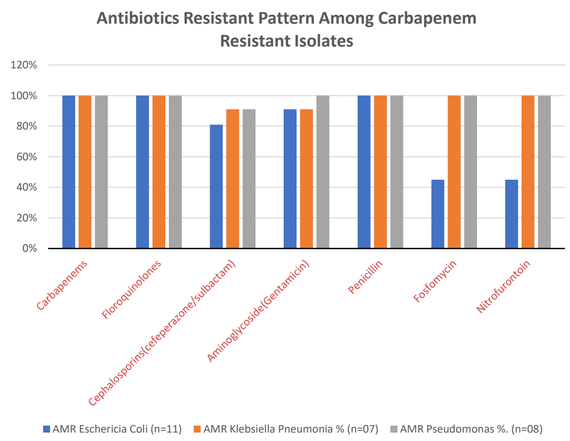
Results

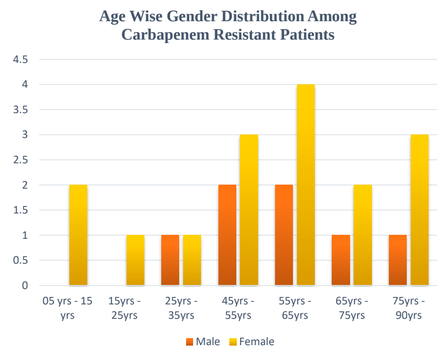
- Out of 161 samples of urine 52% (84/61) were positive for bacterial growth among them 30.9 % (26/84) samples was carbapenem resistant. In this there were 13% (11/26) *E. coli*, 8.3 % (07/26) *were klebsiella Pneumonia*, 9.5% (08/26) were *Pseudomonas Aeruginosa* .



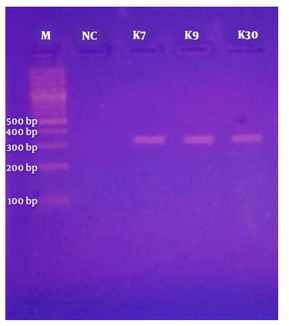


- Among carbapenem resistant isolates of the patient there were 34.6% (09/26) males, 65.4 % (17/26) females. The age of the participants was 05 years to 90 years respectively.
- 11.5 % (03/26) isolates were positive for *mcr-1*. The resistant genes of colistin *mcr-1* was detected in two carbapenem resistant *klebsiella pneumonia* 28.5 % (02/07) and one gene were detected among carbapenem resistant *E coli* 09 % (01/11) however, the other carbapenem resistant isolates 88.4% (23/26) lacks the *mcr-1* gene.
- The gene detected in 11.5% (03/26) patients all were females with the age of 60 years, 70 years and 81 years males lacks *mcr-1* gene.





Identified Bacteria	Bacteria acquire mcr type 1 gene		%age of positive mcr-1 isolates	Gender	Age	Clinical Status
	No of +ve	No of -ve				
E. coli	01	10	9.1%	Female	60 years	Hospitalized
K. pneumonia	02	05	28%	Female	70 & 81 years	Both hospitalized



Conclusion

- This study concluded that carbapenem resistance is increasing among urine isolates and also this harboring the mobile colistin resistant gene *mcr-1*
- The presence of *mcr-1* gene among carbapenem resistant isolate marked the urgent need for awareness about misuse of antibiotics. The surveillance studies on a larger scale to overcome the inappropriate use of carbapenems and formulations and prevent further spread of resistance to this antibiotic.

Huzaifa Gulzar
MS In Medical Lab Sciences (Gold Medalist)
Riphah International University, Islamabad Pakistan.