



## Extended Spectrum $\beta$ -Lactamase Producing Uropathogenic Escherichia coli and the Correlation of Biofilm with Antibiotics Resistance in Nepal

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### Abstract:

Urinary tract infection (UTI) is one of the frequently diagnosed infectious diseases which is caused mainly by Escherichia coli. E. coli confers resistance against the two major classes of antibiotics due to the production of extended spectrum  $\beta$ -lactamase enzymes (ESBL), biofilm, etc. Biofilm produced by uropathogenic E. coli (UPEC) protects from host immune system and prevent entry of antimicrobial compounds. The main objective of this cross-sectional study was to determine the correlation of biofilm production and antibiotic resistance as well as to characterize the pgaA and pgaC genes responsible for biofilm formation among uropathogenic ESBL producing E. coli.

A total of 1,977 mid-stream urine samples were examined and cultured for bacterial strain identification. ESBL was detected by combined disc method following CLSI whereas biofilm formation was analyzed by semi-quantitative method. Furthermore, the pgaA and pgaC genes responsible for biofilm formation in UPEC were detected by multiplex PCR. All the statistical analyses were done via IBM SPSS Statistics 21 where Pearson's correlation test were used to determine correlation ( $-1 \leq r \leq 1$ ).

E. coli was the predominant causative agent, which accounted 159 (59.3%) of the Gram-negative bacteria, where 81 (50.9%) E. coli strains were found to be ESBL producers. In addition, 86 (54.1%) E. coli strains were found to be biofilm producers. Both the pgaA and pgaC genes were detected in 45 (93.7%) the UPEC isolates, which were both biofilm and ESBL producers. More-



over, there was a positive correlation between biofilm and ESBL production.

The analyses presented weak positive correlation between biofilm and ESBL production in which biofilm producing UPEC harbors both pgaA and pgaC genes responsible for biofilm formation.

### Biography:

Raju Shrestha is a Microbiologist by profession and worked with one of the private pharmaceuticals in Nepal. He holds an M. Sc in Microbiology (Medical). Raju has 6 months of internships in Department of Microbiology, Grande International Hospital, Nepal. He had also assisted PhD works of Lecturer and Assistant Professor. He has presented and attended different conferences in Nepal. Raju grew up in one of the middle class family of Nepal and is passionate about controlling infectious diseases.

### Publication of speakers:

1. Shrestha, R., Khanal, S., Poudel, P. et al. Extended spectrum  $\beta$ -lactamase producing uropathogenic Escherichia coli and the correlation of biofilm with antibiotics resistance in Nepal. Ann Clin Microbiol Antimicrob 18, 42 (2019) doi:10.1186/s12941-019-0340-y