

# Drug Resistance and Biofilm Production among *Pseudomonas aeruginosa* Clinical Isolates in a Tertiary Care Hospital of Nepal

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## ABSTRACT

**Background:** Clinical isolates of *Pseudomonas aeruginosa* often exhibit multidrug resistance due to their inherent ability to form biofilms. Drug resistance in *Pseudomonas aeruginosa* is a major clinical problem, especially in the management of patients with nosocomial infections and those admitted to ICUs with indwelling medical devices. To evaluate the biofilm forming abilities of the clinical isolates of *Pseudomonas aeruginosa* and to correlate biofilm formation with antibiotic resistance.

## METHODS

A total of 90 consecutive isolates of *P. aeruginosa* obtained from various specimens collected from patients visiting the Manipal Teaching Hospital, Pokhara, Nepal between January 2018 - October 2018 were studied. Isolates were identified by standard microbiological methods. Antibiotic susceptibility testing was performed by Kirby-Bauer disc diffusion method. All the isolates were tested for their biofilm forming abilities by employing the tissue culture plate assay.

## RESULTS

Of the 90 *Pseudomonas aeruginosa* isolates maximum i.e 42 (46.6%) were from patients in the age group of >50 years. Majority (30; 33.3%) of the isolates were obtained from sputum samples. However, percentage isolation from other specimens like urine, endotracheal tube (ETT), pus, eye specimens and blood were 18.9%, 16.7%, 16.7%, 7.8% and 6.7% respectively. All the isolates were sensitive to polymyxin B and colistin, 91.1% of the organisms were sensitive to imipenem, and more than 80% to aminoglycosides (80% to gentamicin, 83.3% to amikacin). A total of 29 (32.2%) organisms were biofilm producers. Maximum numbers of biofilm producing strains were obtained from ETT (8 of 15; 53.3%), pus

(8 of 15; 53.3%) and blood (2 of 6; 33.3%) i.e from all invasive sites. None of the isolates from noninvasive specimens such as conjunctival swabs were biofilm positive. Significantly higher numbers of biofilm producers (23 of 29; 79.3%) were found to be multidrug resistant as compared to non-biofilm (6 of 61; 9.8%) producers ( $p=0.000$ )[1,2].

## CONCLUSION

*Pseudomonas aeruginosa* colonization leading to biofilm formation in deep seated tissues and on indwelling devices is a therapeutic challenge as majority of the isolates would be recalcitrant to commonly used antipseudomonal drugs. Effective monitoring of drug resistance patterns in all *Pseudomonas* clinical isolates should be a prerequisite for successful patient management.

## REFERENCES

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