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Biofilm Formation and Antibiotic Profile of Bacteria Isolated from Urinary Tract Infections

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Abstract

Urinary tract infection (UTI) id a general term that refers to the presence of microorganisms in the urine. A total of 75 urine samples were collected. All samples were cultured, as suspected of having UTI, and 43 samples (57.3 %) showed growth (positive culture), while 32 samples (42.6 %) were negative cultures. Gram-negative bacteria were the predominant cause of UTI with percentage (93%). While gram-positive were found in 6.96%. *E.coli* were the predominant Gram-negative genus to isolate from UTI patients, while *Staphylococcus sp*. Were the predominant among gram-positive bacteria. Isolation and identification the bacteria based on traditional diagnostic test such as Catalase, Oxidase, Coagulase tests and VITEK-2 system. The study involved determining the antibiotic susceptibility of isolates against 21 antibiotics, the results showed that all pathogens detected were resistant to at least 1-2 antibiotics. The antibiotic that showed highest sensitivity among antibiotics were Ciprofloxacin except *K.pneumoniae* and *S.haemolyticus, E.faecalis*. Meropenem antibiotic was more effective against all gram-negative Bacteria. Biofilm detection by using two different methods: Tube method (TM), Congo red agar method (CRA), among the total organisms isolated 25 (58.1%) showed Biofilm producer (BP), while 18 (41.8 %) Non Biofilm producer (NBP). Strong biofilm production was observed in *E.coli*, *P.aeruginosa*, *K.pneumoniae*. Most of uropathogens form biofilms, with a higher prevalence in antibiotic-resistant strains, sensitive bacteria also form biofilms but less frequently.

More Information

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Introduction

Urinary tract infections (UTIs) are among the most common infectious diseases in the world, impacting millions of people annually. Every part of the urinary system can become infected, including the kidneys (pyelonephritis), urethra (urethritis), and bladder (cystitis) [1]. A urinary tract infection (UTI) occurred when a pathogen colonized any part of the urinary tract, including the kidney, ureter, bladder, and urethra. The majority of UTI instances are caused by bacteria, which also often cause infections in women's feces and perineum when they colonize the intestine as part of the normal flora [2-4].

Both nosocomial infections and outpatient visits are frequently brought on by bacterial urinary tract infections [5]. Up to 50–60% of women experience a UTI at some time during their lives and according to Medina [6] about half of all women will develop an episode of UTI. *Enterococcus faecalis*, *Proteus mirabilis*, *Klebsiella pneumoniae*, *Staphylococcus saprophyticus*, Group B Streptococcus (GBS), *Pseudomonas aeruginosa* and *S. aureus* are some of the organisms that most frequently infect the urinary tract [2]. Uropathogens express fimbrial adhesins that adhere to the host's mucosal–epithelial surface by virtue of binding glycolipids and glycoproteins [7]. Uropathogens employ adhesions to form biofilms on biotic and abiotic surfaces, which allows them to colonize the urinary tract mucosa and indwelling devices like urinary catheters [8]. The treatment of UTIs is seriously threatened by the growth in antimicrobial resistance, which renders many widely prescribed medicines ineffective. Both acquired and intrinsic antibiotic resistance exist; the former is present in every isolation