Detection of Bacterial and Fungal Pathogens Associated with Skin and Soft Tissue Infections in Patients with Diabetes Mellitus Reporting to a Tertiary Care Hospital in Sri Lanka: A Single-Center Study

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Skin and Soft Tissue Infections (SSTIs) in Diabetes Mellitus (DM) patients are a major health concern, often leading to serious complications. This study aimed to identify the bacterial and fungal pathogens associated with SSTIs among DM patients and assess their antimicrobial susceptibility to guide effective treatment. A cross-sectional study was conducted at Teaching Hospital Peradeniya, Sri Lanka, from 21st October to 25th November 2024. Wound swabs from DM patients admitted to surgical and medical wards were collected and processed using conventional culture techniques. Antibiotic Sensitivity Testing (ABST) followed Clinical and Laboratory Standards Institute (CLSI) guidelines. A total of 23 patients were enrolled, with a mean age of 58.8 years; 56.5% were male. Culture positivity was observed in 21 samples (91.3%), from which 39 isolates were identified. Over half (56.5%) of these cases were polymicrobial. Among the isolates, 35 (89.7%) were bacterial and 4 (10.3%) were fungal. Gram-negative bacteria predominated (80%), with *Proteus mirabilis* (20.5%) and *Pseudomonas aeruginosa* (12.8%) being the most common. *Staphylococcus aureus* accounted for 57.1% (n=2) of gram-positive isolates. All fungal isolates were *Candida* species, including *C. auris* (n=2), *C. albicans* (n=1), and *C. parapsilosis* (n=1). *P. mirabilis* exhibited high resistance to ampicillin, co-trimoxazole, cefuroxime, and ciprofloxacin (75.0%, 50.0%, 62.5%, and 50.0%, respectively) but remained sensitive to meropenem. *Staphylococcus aureus* showed low resistance to tetracycline (n=1) and clindamycin (n=1), though 2 isolates were Methicillin-resistant *Staphylococcus aureus* (MRSA). Extended-spectrum beta-lactamase (ESBL) producers were found in 19.0% of patients, MRSA in 9.5%, and Multidrug-Resistant (MDR) strains in 33.3%. One patient had both ESBL-producing and Vancomycin-Resistant Enterococci (VRE). Gram-negative bacteria were more frequently associated with SSTIs in DM patients. Meropenem and amikacin were the most effective treatments for gram-negative infections, while first-line agents like ampicillin and ciprofloxacin showed limited efficacy. Routine culture and ABST are recommended to decide targeted therapy for optimal infection management.

Keywords: Skin and soft tissue infections, diabetes mellitus, antimicrobial resistance, pathogens