

A Clinico-Bacteriological Study and Their Risk Factors for Diabetic Foot Ulcer with Multidrug-Resistant Microorganisms in Eastern India

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Abstract : This study was done to determine the bacteriological profile and antibiotic resistance of the isolates and to find out the potential risk factors for infection with multidrug-resistant organisms. Diabetic foot ulcer is a major medical, social, economic problem and a leading cause of morbidity and mortality, especially in the developing countries like India. 25 percent of all diabetic patients develop a foot ulcer at some point in their lives which is highly susceptible to infections and that spreads rapidly, leading to overwhelming tissue destruction and subsequent amputation. Infection with multidrug resistant organisms (MDRO) may increase the cost of management and may cause additional morbidity and mortality. Proper management of these infections requires appropriate antibiotic selection based on culture and antimicrobial susceptibility testing. Early diagnosis of microbial infections is aimed to institute the appropriate antibacterial therapy initiative to avoid further complications. A total of 200 Type 2 Diabetic Mellitus patients with infection were admitted at GD Hospital and Diabetes Institute, Kolkata. 60 of them who developed ulcer during the year 2013 were included in this study. A detailed clinical history and physical examination were carried out for every subject. Specimens for microbiological studies were obtained from ulcer region. Gram-negative bacilli were tested for extended spectrum Beta-lactamase (ESBL) production by double disc diffusion method. Staphylococcal isolates were tested for susceptibility to oxacillin by screen agar method and disc diffusion. Potential risk factors for MDRO-positive samples were explored. Gram-negative aerobes were most frequently isolated, followed by gram-positive aerobes. Males were predominant in the study and majority of the patients were in the age group of 41-60 years. The presence of neuropathy was observed in 80% cases followed by peripheral vascular disease (73%). *Proteus* spp. (22) was the most common pathogen isolated, followed by *E.coli* (17). *Staphylococcus aureus* was predominant amongst the gram-positive isolates. *S.aureus* showed a high rate of resistance to antibiotic tested (63.6%). Other gram-positive isolates were found to be highly resistant to erythromycin, tetracycline and ciprofloxacin, 40% each. All isolates were found to be sensitive to Vancomycin and Linezolid. ESBL production was noted in *Proteus* spp and *E.coli*. Approximately 70 % of the patients were positive for MDRO. MDRO-infected patients had poor glycemic control (HbA1c 11 ± 2). Infection with MDROs is common in diabetic foot ulcers and is associated with risk factors like inadequate glycemic control, the presence of neuropathy, osteomyelitis, ulcer size and increased the requirement for surgical treatment. There is a need for continuous surveillance of resistant bacteria to provide the basis for empirical therapy and reduce the risk of complications.

Keywords : diabetic foot ulcer, bacterial infection, multidrug-resistant organism, extended spectrum beta-lactamase

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