Microbiological profile and antibiotic sensitivity patterns in Diabetic foot ulcers:

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Background and Aims : Appropriate antibiotic usage based on culture and sensitivity (C/S) report of pus is the gold standard in practice for the management of diabetic foot as infections are often limb threatening. The most common organisms implicated are gram-positive cocci followed by gram-negative bacilli and anaerobes. Polymicrobial infections are not uncommon. Many parts of India are deficient in facilities to obtain a wound culture and study sensitivity patterns. The aim of the study was to study the microbial profile and drug sensitivity pattern and to make appropriate recommendations for initiating the most effective empirical antibiotic therapy.

Methodology: Our study was a retrospective analysis of wound swabs taken from infected foot ulcers of patients with diabetes attending a specialized hospital for diabetes in Bangalore, India. Standard culture techniques and drug sensitivity disks were employed to study all swabs. Reports of 431 patients with a positive wound swab from 2008 to 2011 were analyzed.

Results: 77 patients had grown >1 organism. Fourteen organisms were identified and seven organisms listed below accounted for >90 % of infections. The antibiotic sensitivity patterns of E. coli (23.62%), Staphylococcus aureus (21.06%), Streptococcus pyogens (11.22%), Pseudomonas aeruginosa (10.03%), MRSA (8.66%), Enterococcus faecalis (8.66%) and Proteus mirabilis (8.26%) were further studied. The following antibiotics, cefotaxime (75.8%), ceftazidime (73.6%), amoxycillin plus clavulanic acid (72.32%), ceftriaxone (72.1%) and levofloxacin (68.2%) were sensitive against most organisms except MRSA. Ceftazidine (76.4%), levofloxacin (76.4%), ciprofloxacin (76.4%), gentamycin (64.7%) and amikacin (64.7%) were sensitive against Pseudomonas; and vancomycin (100%), teicoplanin (100%), clindamycin (97.7%) and linezolid (95.45%) against MRSA.

Conclusions: Our study showed that gram-negative bacilli were the most common infecting organisms followed by gram-positive cocci. There was no change in the microbial profile or sensitivity pattern over the course of the study. Ceftazidime was the antibiotic sensitive against most of the organisms isolated, implying that it should be the first line of therapy. However, keeping the cost benefit ratio in mind, combination of amoxycillin plus clavulanic acid and levofloxacin was found to be the more affordable antibiotic combination, two and a half times less expensive than ceftazidime, covering the same spectrum of organisms. We recommend that empirical antibiotic therapy should cover gram-negative bacilli and gram-positive cocci. Subsequent therapy should be tailored to the C/S report. In a centre lacking C/S facilities, we recommend that clindamycin be added empirically as the third drug to cover MRSA.