Study on isolation and characterisation of bacterial pathogens in orthopaedic implant associated infections in a tertiary care centre.

Abstract:

I**ntroduction**: Orthopaedic device related infection (ODRI) remains a major complication in modern trauma and orthopaedic surgery. It is a challenging task to treat ODRIs which may lead to implant replacement and in severe cases amputation and even mortality. **Aim**: To isolate and identify organisms from post operative orthopaedic implant infections and determine their antibiogram, and to study the molecular characterisation of resistance genes. **Materials and Methods:** This prospective study was conducted on patients with orthopaedic implant infections admitted in orthopaedic wards, Coimbatore Medical college Hospital, Coimbatore over a period of one year. Pus samples were collected aseptically using sterile swabs and sterile syringes for direct Gram's stain, aerobic and anaerobic culture. Isolates were identified according to the standard protocols and antibiotic sensitivity was done by Kirby Bauer's disc diffusion technique. **Results**: Out of 137 implant infection cases 116(85%) were culture positive and 21(15%) were culture negative. Gram positive cocci Staphylococcus aureus (29%) was the commonest isolate followed by Gram negative bacilli Klebsiella species (18%). Males (75%) are more commonly affected due to road traffic accident presenting with open fractures. In this study more number of early post operative infections (79%) are found, rather than delayed (13%) and late (8%) infections. Diabetes mellitus (36%) was the most common co-morbid condition found, apart from this proven risk factor,

smoking and alcoholism were also noted (23%) and (21%) respectively. All the Gram positive cocci showed 100% sensitivity for Linezolid and Vancomycin. Among the Staphylococcus aureus, (67%) of the isolates were MSSA and (32.3%) were found MRSA. Genotyping by PCR, out of 11 MRSA strains 10 isolates were found positive for mecA gene. All the Gram negative bacilli and pseudomonas showed 100% sensitivity for Meropenem. Most of the Gram negative bacilli showed high level resistance to third generation cephalosporin's. 62.5% of E Coli, 50% of Proteus species, and 47.6% of Klebsiella species were found to be ESBL producers (phenotypic confirmation by combined disk method). **Conclusion**: The incidence of multidrug resistance pathogens as a cause of implant infections is rising. This study clearly shows the changing trends of microbial isolates with special emphasis on the emergence of MRSA and ESBL strains in our hospital set up. The Diagnostic Microbiology thus plays a crucial role in this context, and aids the surgeons in the proper selection of antibiotics as per the Antibiotic policy guidelines issued by Hospital Infection Control Committee.

Keywords: Orthopaedic implant infections, Bacteriological profile, Antibiogram, Methicillin Resistance Staphylococcus Aureus, Extended spectrum Beta Lactamase.