# MICROBIOLOGICAL STUDY OF ETIOLOGICAL PATHOGEN IN EARLY INFECTION OF OPEN FRACTURE IN ORTHOPEDICS

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## PURPOSE:

To evaluate the susceptibility of microorganism causing early infection in open fractures to current antibiotic prophylaxis and determine contributing factors towards development of resistance.

## METHODS:

A total of 110 cases of open fractures were selected in this study. They underwent routine debridement and C&S were followed up. Risk factors to antibiotic resistance were identified.

## RESULTS:

Admission to ICU, blood transfusion, antibiotic regime and duration, fracture grade, injury severity score and duration of admission were significantly associated with resistance of microorganism. There was Gram-negative predominance of 65.9%. The overall resistance to Cefuroxime was 68.6% and 36.9% to Gentamicin. Staphyloccoccus aureus and MRSA were the commonest Gram-positive while Pseudomonas and Acinetobacter Gram-negative.

| Characteristics | $\chi^2$ – statistics[a] (df) | *p*-value |
|---|---|---|
| **Gender** | 3.80 (1) | 0.051 |
| **Age category** | 4.70 (3) | 0.195 |
| **Medical Illness** | 2.82(3) | 0.42 |
| **Side of injury** | 2.17 (1) | 0.141 |
| **ICU** | 18.19 (1) | < **0.001** |
| **Blood transfusion** | 22.45 (1) | < **0.001** |
| **Antibiotic regime** | 29.99 (3) | < **0.001** |
| **Debridement** | 3.40 (2) | 0.183 |
| **Fracture Grade** | 41.6(4) | < **0.001** |
| **Injury Severity Score** | 31.44(4) | < **0.001** |
| **Duration of admission** | 21.18(2) | < **0.001** |
| **Duration of Antiiotics** | 23.45(3) | < **0.001** |

**Table 1: Association between Multiple Variables to Sensitivity of Microorganism**

## DISCUSSIONS:

Resistance in open fracture is not well established unlike rate of infection. Previous studies reported predominant Gram-postive microorganisms which form the basis of prophylactic antibiotics[1]. Hannigan et al. reported increasing multi-drug resistance bacterias in open fractures[2]. Carsenti-Etesse et al. reported resistance was influenced by type and duration of antibiotics while others have described various other factors[3].

## CONCLUSION:

The high resistance of microorganisms and shift to predominantly Gram-negative microorganisms is alarming. Further measures are needed to achieve optimal outcome.

## REFERENCES:

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3. Carsenti-Etesse, H. et al., 1999. Epidemiology of bacterial infection during management of open leg fractures. *European Journal of Clinical Microbiology and Infectious Diseases*, 18(5), pp.315–323