



Microbiologic Profile of Orthopaedic Implant Infection – A Retrospective Study

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Abstract

Background: *Orthopaedic implant infections are a common complication of any orthopaedic unit. A variety of microorganisms are implicated. Nosocomial or Hospital based pathogens are the major cause. Among these pathogens staphylococcal epidermidis is the leading cause following by Escherichia coli. This study is aimed to identify the major pathogens causing implant infections in a tertiary hospital.*

Materials and Methods: *This is a retrospective study of 50 (fifty) patients who were admitted in Govt. Medical College, Trivandrum. All types of implant infection after trauma surgery which includes, intramedullary nails, plates, were included. Infected Arthroplasties of Hip and Knee are also included. Culture and sensitivity reports of infections were analyzed.*

Results: *Staphylococcus epidermidis (30) was the leading cause of implant infection followed by Escherichia coli, pseudomonas.*

Conclusion: *Hospital based or acquired infections are leading cause. Hence better hospital having theatre sterilisation maintenance would help to reduce the load of infection.*

Introduction

Implant infections tends to compromise the results of any orthopaedic surgery. There is no fool proof technique to avoid such infection.

Good Hospital sterilisation which includes ward and theatre sterility play a major role in preventing infections patient related factors like. Diabetes, open fractures, immunosuppressed patients are at a higher risk. Culture taken from sinus and intra operative cultures givean information of pathogen and their sensitivities.

The commonly observed pathogens were staphylococcus epidermidis.

Escherichia coli

Pseudomonas aeruginosa

Staphylococcus aureus

Streptococci

Klebsiella

In our institution staphylococcus epidermidis was the leading cause of infection.

Objectives

1. To identify the most common organism causing implant infection.
2. To Analyse the cause of leading infection and their source.

Materials and Methods

Implant related infected patients were admitted to the hospital period 2019-2020 Type of implant used was noted.

This includes various types of IM nails, plates S.S. (Stainless steel wires) and arthroplasties of Hip and knees.

Inclusion Criteria

1. All trauma related implants
2. Diabetes
3. Steroid intake
4. Open fractures
5. Timing of surgery
6. Presence of malignancy

Exclusion

1. Perioperative infection occurring with 1 month of after surgery
2. Soft tissue surgery like tendon repair.
3. Infection on external fixator frames.

Culture and sensitivity reports taken on admission from round site discharge and preoperative culture were analysed after 48 hrs.

If found sterile a repeat culture was sent after 2 days.

Results

Staphylococcus epidermidis was found to be major cause of infection 32 patients (64%) and followed by E.coli 10 (20%) followed by pseudomonas 5 (10%)

These organisms were usually sensitive to 3rd generation cephalosporins.

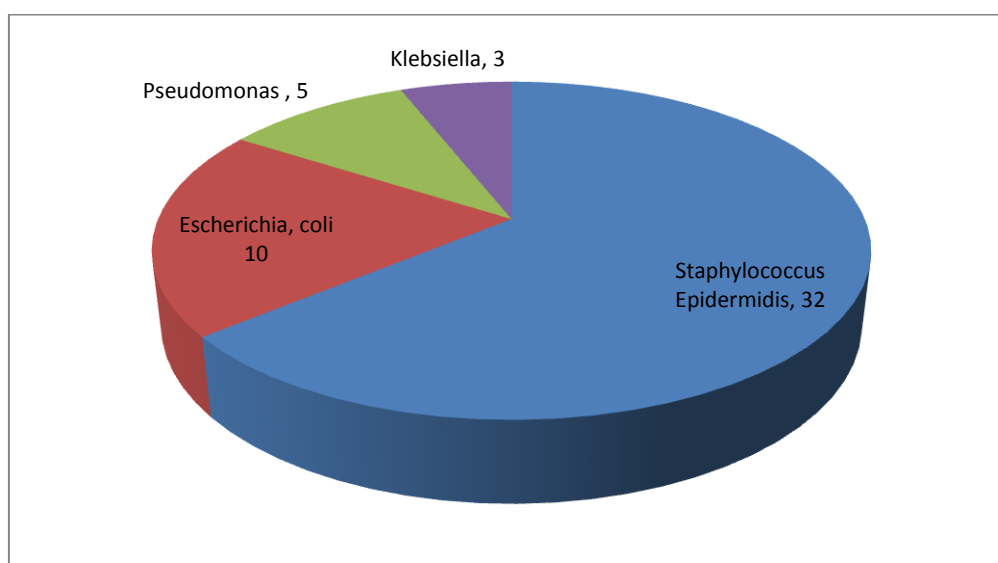
Diabetes mellitus was associated in 25 patients (50%) followed by open fractures 18 (36%) other factors include, steroids, malignancy, COPD, males were predominant 49 (89%).

20 patients (40%) had been operated in Emergency O.T indicating that sterile condition in the emergency O.T. set up has to be reviewed.

Road traffic accidents were the major cause in 36 patients (72%) indicating the velocity of trauma also contributed to future infection only 4 were arthroplasty infection (8%). The reason could be that arthroplasties were done electively and after screening patients related factors and treating the co-morbidities.

Summary of Results

Micro Organisms	Number
Staphylococcus Epidermidis	32
Escherichia coli	10
Pseudomonas	5
Klebsiella	3



Mode of Injury	Number
Road Traffic accident	36
Domestic accidents	43
Machinery	8
Other	3

Associated Co-morbidities	Number
Compound fracture	318
Diabetes mellitus	25
Alcoholism	39
COPD + STEROID	5
Machinery	2

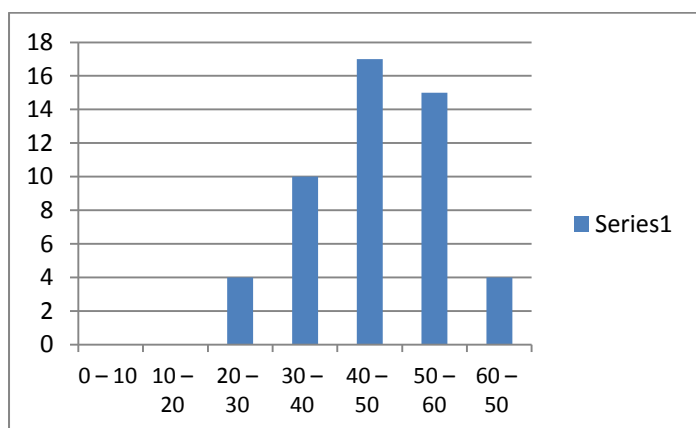
Gender Wise Analysis

Inected Implants

Male	44
Female	6

Age Wise Distribution

0 – 10	0
10 – 20	0
20 – 30	4
30 – 40	10
40 – 50	17
50 – 60	15
60 – 50	4



Discussion

The microbiologic profile of orthopaedic implant infection varies from different institutions. However nosocomial organisms are found to be the leading cause.

In our study staphylococcus epidermidis and pseudomonas appear to be the major cause. This points to improvement of the sterile environment in the hospitals. These include the operating room, surgeon related factors and related infections.

Improved hospital based sterility will bring a reduction in the infection load. However the patient related factors like presence of diabetes, open fracture, Alcoholism, and advancing age play a major role in the development of implant infection as they decrease the general immunity.

Conclusion

Improvement of Hospital sterility, control of co-morbid factors like diabetes and alcoholism, play a major role in infection of implants. Planning of the surgery in an elective operative room than emergency operating room set up was found to reduce infections. However the infections cannot be totally eradicated as multiple factors lead to emergence of nosocomial organism.

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