

ORIGINAL ARTICLE

PREVALENCE OF POST-OPERATIVE WOUND INFECTIONS AMONG ORTHOPAEDICS PATIENTS WITH SURGICAL IMPLANT TERTIARY CARE HOSPITAL

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Background: Germs may infect an injured site via the tissues when the host's systemic and local defences are compromised. Pus discharge may be a sign of a significant wound infection, requiring a follow-up operation to ensure sufficient draining. Additionally, generalized symptoms may appear, and returning home may need to be postponed. Objective was to identify the prevalence of post-operative wound infections among orthopaedics patients with surgical implant tertiary care hospitals. **Method:** A cross-sectional study was conducted at a tertiary care hospital from July to December 2023, involving 180 patients with closed long bone fractures. The patients were immune-competent, not diabetic, and older than 10 years. All patients underwent surgery using implants, with general anaesthesia and a third-generation cephalosporin prophylactic antibiotic. Patients were monitored monthly for 6 months to monitor infection symptoms. Cultures were obtained from wound discharges, and patients experienced perioperative fever for two days following surgery. Data was collected and analyzed using the SPSS 22 version. The study aimed to improve the management of bone fractures. **Results:** A total of 180 patients were selected for the current study including both males (65.60 %) and females (34.4 %) with closed fractures. Most of them were above 31 years of age, furthermore, 20.5 % and 24.4 % of them were 41-50 as well as above 60 years of age. 13 (7.22 %) of them had developed them post-operatively. 0.76 % had pre-operative stays in the hospital for more than 10 days. Staphylococcus aureus was the most frequent 5 (38.6 %) bacteria. 6 (46.15 %) were managed by frequent irrigation along with 4 (30.76 %) by the administration of antibiotics. **Conclusion:** Post-operative infection is one most troublesome complication among implanted patients. in the current the prevalence of post-op infection is 7.22% which is comparable in developing nations, but far higher than that in developed countries. As a result, it should be managed with early detection and treatment, as well as by eradicating the prevalent causes of wound infections following surgery that the present research identified.

Keywords: Orthopaedics Implants; Close fractures; Staphylococcus aureus; Postoperative wound infection

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INTRODUCTION

Germs may infect an injured site via the tissues when the host's systemic and local defences are compromised. Pus discharge may be a sign of a significant wound infection, requiring a follow-up operation to ensure sufficient draining. Additionally, generalized symptoms may appear, and returning home may need to be postponed.¹ When germs infiltrate the surgical site within 30 days after the procedure—or, in the case of implant insertion, a year later—it is referred to as post-operative infection. Post-operative infection is a major problem in orthopaedics, especially if it occurs after implant surgery. Because of the

potential for increased hospital stays of 10–20 days, an increase in readmission rates, financial strain on the patient and their family from care costs, severely restricted physical activity, and a marked decline in the patient's overall quality of life, serious surgical infections (SSIs) associated with orthopaedic procedures are regarded as catastrophic complications.² Surgical wound infection results in significant morbidity and negatively affects the outcome. There are multiple reasons why perioperative wound infections develop.^{3,4} Pathogens can enter a wound both directly and indirectly through blood-forming routes, the operating room, the surroundings, surgical

instruments, the surgeon, or the patient.⁵⁻⁸ Infection of the wound is the most common and troublesome complication for wound rehabilitation.⁹ The most important findings since Hippocrates have enhanced our understanding of surgical site infections (SSIs). SSI rates following orthopaedic surgery might range from 1.4 to 22.7%.¹⁰ bacteria on the patient's skin, bacteria already present in their body, and clothing that the doctor and other paramedical staff have worn. Implant-associated infections result from bacterial adhesion to an implant's surface, and these infections foster the growth of biofilm at the implant placement site.¹¹ The incidence of postoperative wound infections has dramatically decreased as a result of the use of antibiotics, proper sterilizing techniques, modified surgical methods, and cutting-edge suture materials.¹² Nonetheless, rates of wound infection following surgery in public hospitals are still high.^{13,14} The objective of this research project was to investigate the factors that lead to wound infection after surgery and to reduce the risk of infection by controlling the factors that lead to infection. Furthermore, it will lessen the financial burden and morbidity on physicians in addition to assisting them in minimizing wound infections following surgery.

Objective was to identify the prevalence of post-operative wound infections among orthopaedics patients with surgical implant tertiary care hospitals.

MATERIAL AND METHOD

The current descriptive cross-sectional study was conducted at the orthopaedic and trauma department of a tertiary care hospital from July to December 2023 after the approval of the ethical review board. A total of 180 patients of both genders were selected. Participants in this trial had to have closed long bone fractures, be immune-competent, not have diabetes, be clear of infections, and be older than 10 years for either sex when implantation was applied. This study did not include any cases of steroid medication, chemotherapy, diabetes mellitus, skin diseases, fractures that were open, or individuals with any noticeable infection areas. All 180 patients with close fractures underwent surgery within that period, using implants. A proforma was completed by every patient who was part of the research. General anaesthesia was used for the procedures on each subject. A third-generation cephalosporin prophylactic antibiotic was given 15 to 20 minutes before the incision and then sustained for seventy-two hours afterward. The implanters were sterilized using the normal autoclave procedure. The initial dressing was changed on the third postoperative

day. Patients were then discharged on the fifth or seventh postoperative day, and on the fourteenth postoperative day, they called to have their stitches removed. For 6 months, it was recommended that every individual follow up monthly in the OPD to monitor any indications or symptoms related to a recent infection. We looked for any swelling, redness, or drainage coming from the wound. Patients under careful monitoring until their infections subsided, and until their infections subsided were those who experienced perioperative fever that persisted for two days following surgery. Cultures were obtained from wound discharges, or in cases where there was a large amount of fluid collected, evacuation of the fluid was performed, alternative stitches were extracted early, and if necessary, drainage and incision of the collection were undertaken. In cases involving collection, thorough debridement was carried out, and three days of constant irrigation-sucking drainage were set up after surgery. All the data was collected thoroughly and the data was analyzed by using the SPSS 22 version.

RESULTS

A total of 180 patients were selected for the current study including both males (65.60%) and females (34.4%) with closed fractures. Most of them were above 31 years of age, furthermore, 20.5% and 24.4% of them were 41-50 as well as above 60 years of age.

Table 2 highlights the incidence of post-operative wound infection among the study participants who underwent implant surgeries. 13 (7.22%) of them had developed them post-operatively. The main factors related to post-operative wound infections; firstly 46.15% of those having age more than 50 years of age had developed the post-op infection. 30.76% had pre-operative stays in the hospital for more than 10 days and 15.38 % of them had prolonged surgical time of more than 2 hours, in addition, 1 (7.69%) had incorrect fixation as shown in Table 3.

Table 4 represents the microorganisms that caused the post-op infection. *Staphylococcus aureus* was the most frequent 5 (38.6 %) bacteria among the infected individuals, followed by *Klebsiella Pneumoniae*, *E. coli*, and *Acinetobacter* each counted up to 2 (15.38%). Moreover, 1 (7.69%) had a methicillin-resistant staphylococcus aureus (MRSA) infection.

The management of infected cases is highlighted in Table 6 below. In most of the cases, 6 (46.15%) were managed by frequent irrigation along with 4 (30.76%) by the administration of antibiotics. Moreover, 3 (23.07%) of them were treated by debridement and removal of the implant followed by external fixation.

Table-1: Sociodemographic Characteristics

Gender	Number	Percentage
Male	118	65.6
Female	62	34.4
Age (years)		
10-20	19	10.5
21-30	28	15.5
31-40	23	12.7
41-50	37	20.5
51-60	29	16.1
>60	44	24.4

Table-2: Incidence of Post-Operative Wound Infection

Total No of Cases	Infected cases	Percentage
180	13	7.22

Table-3: Factors related to Post-Operative Wound Infection

Factors	Number	Percentage
Age >50 years	6	46.15
Pre-operative stay > 10 days	4	30.76
Prolonged operative time > 2 hours	2	15.38
Incorrect fixation	1	7.69

Table-4: Causative Agents Distribution Among Infected Implant Patients

Microorganism	Number	Percentage
<i>Klebsiella pneumoniae</i>	2	15.38
<i>Staphylococcus aureus</i>	5	38.46
<i>Pseudomonas aeruginosa</i>	1	7.69
<i>E. coli</i>	2	15.38
Acinetobacter	2	15.38
MRSA	1	7.69

Table-5: Management of Infected Patients

	Number	Percentage
Antibiotics therapy	4	30.76
Frequent irrigation	6	46.15
Debridement and removal of implant followed by external fixation	3	23.07

DISCUSSION

Orthopaedic implants have completely changed the way that fractures and non-infectious joint arthritis are managed. Nonetheless, infections associated with implants continue to be a major issue. According to recent research, the risk of infection for orthopaedic implants is between 1% and 2%, which is in line with previous findings.¹⁵ Kim *et al.* state that surgical gloves can get infected during operations, especially if they take longer. The risk of infection is reduced when wearing gloves.¹⁶ The delivery of antibiotics via an IV is a particularly important step, according to Siddiqi *et al.*, in minimizing wound infection.¹⁷ The current study found that 7.22% of study participants who had implant operations experienced post-operative wound infection. Of the individuals over 50, 46.15 percent had developed a post-operative infection. Thirty-seven percent of patients required longer than ten days in the hospital prior to surgery, and fifteen percent of patients required longer than two hours of surgery. In a similar vein, Soomro ZI *et al.*'s study found that the infection frequency was 5% among 26 developing infections.

In 69.2% of cases, the strain *Staphylococcus aureus* continued to be the most often isolated pathogen. Among the 69.2% of those over 60, 19.2% underwent lengthy surgery (lasting longer than two hours), and 19.2% had been in the hospital ward for more than 14 days prior to the procedure.¹⁸ According to a study, there was a 1.51–1.55% chance of infection for orthopaedic surgeries requiring implants. This is consistent with findings from other worldwide research.¹⁹ Infection rates following surgery range from 2% to 5% in US hospitals, according to Franco LMC *et al.*²⁰ The most common five (38.6%) bacteria found in the infected patients in the current investigation were *Staphylococcus aureus*, followed by *Klebsiella pneumoniae*, *E. coli*, and *Acinetobacter*, each of which was found in up to two (15.38%) cases. Additionally, one (7.69%) person acquired an infection with methicillin-resistant *Staphylococcus aureus* (MRSA). Soomro ZI *et al.* describe similar findings. The majority of the participants in our study were over the age of 31, and additionally, 24.5% and 25.5% of them were over 60 and 41–50 years old,

respectively. These data are corroborated by the research conducted by Dhyani A. *et al.*, which showed that an infection at the surgical site occurred in 8.5% of instances. The age range of 41–60 years old was shown to have the majority of infections.³

CONCLUSION

POs-operative infection is one most troublesome complication among implanted patients. In the current the prevalence of post-op infection is 7.22% which is comparable in developing nations, but far higher than that in developed countries. As a result, it should be managed with early detection and treatment, as well as by eradicating the prevalent causes of wound infections following surgery that the present research identified.

AUTHORS' CONTRIBUTION

ART: Concept. MIM, MSA: Data collection, data analysis. MUF, NSM, RAB: Data interpretation, proofreading, review.

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