



## Orthopaedics

## HOSPITAL ACQUIRED INFECTION IN ORTHOPAEDIC SURGERY

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**(ABSTRACT)** **Background:** Post Surgical infection in Orthopaedic surgery is a disaster both for the patient and surgeon. This can lead to increased antibiotic usage, need for repeated surgical debridements, morbidity, prolonged rehabilitation and mortality. **Objective:** To assess risk factors responsible for Orthopaedic surgical site infection, to find prevalence of infection after the surgery. **Materials And Methods:** 2504 operated patients in the department of Orthopaedics between 2015-2022 out of which 50 developed postoperative infection at the surgical site, data collected from the medical records of inpatient folders and nurses records of patients admitted. **Results:** Among the data collected Diabetes has the highest prevalence for causing post surgical infection. **Conclusion:** Post surgical infection can be prevented by taking proper evaluation of the patient during the preoperative period, identifying the risk factors and taking proper measures to control the modifiable risks. OT personnel should also be educated for taking proper aseptic precautions intra operatively and aseptis to be followed during the postoperative period for wound dressing.

**KEYWORDS :** Surgical site infection, Orthopaedic surgeries, Smoking, Diabetes, Staphylococcus aureus

## INTRODUCTION

Post surgical infection in orthopaedic surgery is a disaster both for the patient and surgeon. This can lead to increased antibiotic usage, the need for repeated surgical debridements, morbidity, prolong rehabilitation and mortality.(1) Surgical Site infections accounts for 38 percent of nosocomial infections.(2)The most common organism causing SSI in orthopaedic implant surgeries is Staphylococcus aureus (50%) followed by E. Coli and Proteus (33.3%) and Klebsiella (16.6%). With the introduction of antibiotics and standard aseptic measures the SSI rate in orthopaedic surgeries has been greatly reduced.(3)

The main risk factors for this includes: advanced age, smoking, high BMI, Immunocompromised and chronic disease. In orthopaedic patients, the surgical site infection prolongs hospital stay on an average of two weeks, doubles re-hospitalization rates, and costs can increase by over 300%. In addition to this, patients are known to have physical limitations.(4)

The aim of this study was to find the prevalence and determinants of surgical site infection in patients undergoing orthopaedic surgery.

## OBJECTIVES

1. To assess the risk factors responsible for orthopaedic surgical site infection in orthopaedic surgery.
2. To find the prevalence of infection after surgery.
3. To find out the causative organism responsible for the infection.

## Review Of Literature

In a prospective study done by Muhammad Thahir et al., at Southern railway hospital from January 2006- 2007. Among 125 patients, 13 patients had post- operative superficial surgical site infection and presented within 21 days of operation. The infection rate was 10.4%. most common infection identified was Staphylococcus aureus in 5 patients, MRSA in 3 patients.

In a cohort study done by Keykhosro Mardanpour et al., In a hospital of Iran between 2012 - 2015. Out of 1,900 patients, 73 suffered from SSI (3.84%). MRSA accounts for 53%. Their study showed that smoking, high BMI, multiple fractures, increased operation time, increased bed stay, electivity of the operation, type of operation, using prosthetic implant and pre- operation of prophylactic antibiotic were all significantly associated with increased evidence of SSI.

In a prospective study done by Amaradeep Get al., In Mandya Institute of Medical Sciences, Mandya (Karnataka), India during october-2016 to march-2017. Out of 248 patients 11 patients developed SSI of which male was 8 and female was 3. Staphylococcus aureus was the most common organism in 54.54% cases. SSI was significantly associated

with increasing age, diabetes mellitus, smoking and anaemia.

In a retrospective cross- sectional study done by Stephen Apanga et al., in the year 2012 in the surgical ward of the Tamale Teaching Hospital in the Northern region of Ghana. In a total of 352 infected cases 61.0% were males and 39.0% were females. 35% of Sis were recorded in Those who underwent emergency surgery while 65% of them were recorded in elective surgical cases. Diabetes was the only comorbidity that was found to be a significant predictor of SSIs in this study.

## MATERIALS AND METHODS

**Study Design:** Retrospective descriptive study

**Study Area:** The study will be conducted in the department of Orthopaedics in Kanachur institute of medical sciences and research centre.

**Study Population:** All in patients in the department of Orthopedics in Kanachur institute of medical sciences and research centre.

**Study Period:** 2015 – 2022

## Inclusion Criteria

The study participants comprise of all in patients in the department of Orthopedics in Kanachur institute of medical sciences and research centre who underwent post surgical infection.

## Exclusion Criteria

Patients who are under immunosuppressive drugs, Out patients, Pregnant women, Open fracture type 2 and 3, Patients operated outside KIMS.

## Sample Size

The study included 2504 patients in the orthopaedic department who underwent surgery. Out of it 53 patients had postoperative infection.

## Data Collection

Medical records in inpatient folders and nurses records of patients admitted to the same Macintosh sheet for patients are also found as modifiable risk factors for infection.

Orthopaedic ward, diagnosed with surgical site infection by an attending surgeon within the duration of study were reviewed.

The following factors were considered for the study.

1. Socio demographic factors such as age and gender were considered.
2. Clinical profile which included history of presentation, comorbidities, smoking history, preparation of parts, type of surgery, duration of surgery, prophylactic antibiotic administration, duration of hospitalization, Care taken after surgery, post surgical hospitalization, type of infection, organism present in culture, post antibiotic administration.

**Socio-demographic Factors**

Gender	Frequency (n=50)	%	Mean Age	Standard Deviation
Male	34	68.0	42.34	18.405
Female	16	32.0		
Total	50	100.0		

**RESULTS**

Among the risk factors, Diabetes in patients and duration of surgery have proven to be nearest to the P value, indicating as the important risk factor leading to post surgical infection. 58% of the infected cases patient is a diabetic.

Other significant risk factors are history of smoking and longer duration of surgery. 42% of the infected cases had positive history for smoking and 78% of the infected cases had a duration of more than 3 hours for surgery.

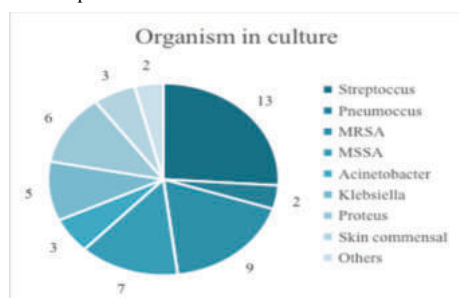
Preoperative preparation of the patient such as accessing iv cannulas without taking proper asepsis or part preparation, insertion of Foley catheter without proper asepsis, postoperatively wound dressing using the same macintosh sheet for patients are also found as modifiable risks factors for infections

		Duration of Surgery(hours)			Total
		1	2	3	
Y	Count	1	2	26	29
	% within	3.4%	6.9%	89.7%	100.0%
	DM				
	Count	3	5	13	21
N	% within	14.3%	23.8%	61.9%	100.0%
	DM				
	Count	4	7	39	50
	% within	8.0%	14.0%	78.0%	100.0%
Total					
DM					

**Chi-Square Tests**

	Value	df	Asymptotic Significance	Exact Sig. (2-sided)	Exact Sig. (1-sided)
			(2-sided)		
Pearson Chi-Square	5.479 <sup>a</sup>	2	.065 <sup>*</sup>	.075	

\*p value <0.05 is considered statistically significant  
Test used: Chi square test



Most common organisms found to be prevalent in the study are Streptococcus species (26%) and Methicillin-Resistant Staphylococcus Aureus (MRSA) (18%).

**CONCLUSION**

Majority of the orthopaedic infections can be prevented. Educating the staff nurses for aseptic precautions during IV cannula insertion and foleys catheter insertion. Creating awareness among patients about smoking and its adverse effects and motivating them to quit smoking. It has been found that the chance of infection is more if the duration of surgery is more. Surgeons can be encouraged to cut down the duration of surgery as it can reduce the rate of infection.

Reducing the trafficking of students and staffs in the operation theatre while performing major orthopedic surgery can help in bringing down the rate of infection. An alternative such as live video demonstration of the surgery can be arranged for the students. Preparation of parts should be done just before shifting to OT and not on the previous days of surgery. Avoiding posting infected orthopedic cases in the same operation theatre where routine orthopedic surgeries are done.

Aseptic precautions to be maintained during postoperative dressings of the wound.

Educating the OT personnel to clean the OT regularly with aseptic precautions and timely survey of microbial contamination in the operating room should be done.

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