

Section **Orthopaedics**

Original Article

The Prospective Study on Post-Operative Wound Infections in Orthopaedics IPD of a Tertiary Care Teaching Hospital

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ABSTRACT

Background: The rate of postoperative wound infection varies from one to nine per cent, depending on the surgical procedure. Each postoperative wound infection increases the length of stay in hospital, the cost of the procedure and is associated with significant morbidity.
Methods: This prospective study was conducted in the IPD of Orthopaedics. The population of study was 200 cases. The duration of study was over a period of two year.
Results: Predominant organism is *Pseudomonas aeruginosa* which were 57.1% from post-operative infected wound followed by 14.2% *Klebsiella pneumonia*, 10.7% *Proteus* & *Staphylococcus aureus* & 8% *Escherichia coli*.
Conclusions: The present study concludes that culture & sensitivity may help in treatment & cure of infection.

Keywords: Post-operative wound infection, Isolates, Infections


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INTRODUCTION

On the basis of surgical procedure, the rate of postoperative wound infection differs from one to nine per cent. Due to postoperative wound infection, the length of stay in hospital and the cost of the procedure got increased. It is also associated with significant morbidity.¹ Wound infection can be defined as discharge of pus from the surgical wound as a complication of surgery. Simple gaping of the wound without any discharge is known as deranged healing instead of infection. Wilson et al. classified the infection in three categories mild, moderate and severe.² Skin is an anatomical barrier against infections and surgeries may lead to postoperative infections as this cause a break in the skin. The immune status of the patient to resist infection plays an important role in determining the outcome of the

post-operative period. Any purulent discharge from surgical incision along with inflammation of the tissue surrounding is considered as wound infection, regardless of micro-organisms cultured or not. Infections are reported to occur at incision sites within 30 days of surgery, but wounds that are closed and healed rarely get infected.³ Simple gaping of the wound without any discharge is considered as deranged healing rather than infection. Wilson et al. quantified the infection as mild, moderate and severe.² Surgical site infection is an extremely important postoperative complication. It has been reported in epidemiologic studies that SSI developed approximately 2% of hospitalized patients undergoing surgeries, although this is the tip of the iceberg just because of underreporting by

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patients.⁴ Each postoperative wound infection prolongs the hospital stay thus, increasing the cost and morbidity.⁵ In spite of the modern surgical and sterilization techniques and the use of prophylactic antibiotics, postoperative wound infections pose a great threat to the patients in terms of morbidity and mortality and for healthcare systems in terms of economic costs.

Staphylococcus aureus is the commonest organism to cause post-operative wound. It is reported that this organism is present in all the hair-bearing areas in 5% of the population while in nostrils of 50%.^{6,7} Apart from this, *Pseudomonas*, *Klebsiella*, and *Enterobacter* species are also found on the hands exposed to moisture, abrasions associated with chronic skin disease and nail bed lesions.

METHODS

Study Area:- This study was conducted on the patients admitted in the IPD of Orthopaedics.

Study population:-The population of study was 200 cases.

Study Duration:-The duration of study was over a period of two year.

Data collection: - Contaminated wound sample were collected & sent to Department of microbiology for culture & sensitivity. Who had minor surgeries were not considered. In this study we excluded the cases that had procedures in which wounds are left open and operations on ulcers. Random 200 cases were included who had both elective and emergency surgeries. Consent form was filled by every cases and previous history were taken about DM, Hb, etc..

Data Analysis:-Data were analysed by using Microsoft excel.

RESULTS

In this study 200 total numbers of cases were included. Out of 200 cases 14% cases were infected post- operatively & 86% non-infected. Among the 14% cases 17.8% cases had emergency operative procedure & 82.2% cases had elective surgery procedure. Out of all cases 14.3% were female & 85.7% were male. In this study among the 28 post-operative infected wound cases 14 mild followed by moderate (8 cases), severe (4 cases) & 2 burst abdomen cases were found. We observed that 67.8% cases were non-diabetic & 32.2% cases were diabetic. Predominant organism is *Pseudomonas aeruginosa* which were 57.1% from post-operative infected wound followed by 14.2% *Klebsiella pneumonia*, 10.7% *Proteus* & *Staphylococcus aureus* & 8% *Escherichia coli*.

Table 1: Distribution of cases according to infective cases

Infected cases	No. of cases	Percentage
Infective wound	28	14
Non-infective wound	172	86
Total	200	100

Table-2 Distribution of cases according to gender

Gender	No. of cases	Percentage
Female	4	14.3%
Male	24	85.7%
Total	28	100%

Table-3 Distribution of cases according to infective wound

Infected wound	No. of cases	Percentage
Mild	14	50%
Moderate	8	28.5%
Severe	4	14.2%
Burst abdomen	2	7.1%
Total	28	100%

Table-4 Distribution of cases according to Diabetes

	No. of cases	Percentage
Diabetic	9	32.2%
Non-diabetic	19	67.8%
Total	28	100%

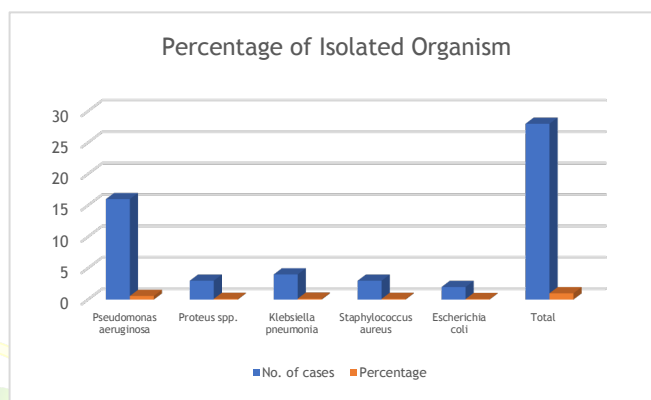


Fig-1 Distribution of cases according to isolated organism

DISCUSSION

The postoperative wound infections have been reported to be affected by various factors such as the immune status of the patient, local tissue factors and the nature and degree of contamination of the wound.⁸ Various intrinsic and extrinsic factors have been implicated in wound infection. A postoperative wound infection rate of 14% was reported in the present study. It has been reported that infection rate was more the contaminated, dirty and emergency surgeries in comparison to elective and clean surgeries.⁹ SSI rate is two times higher in the geriatric age group in comparison to the younger population and the peak has been reported in over 65 years. Higher male preponderance to SSI has been reported in various studies. A Male: female ratio of approximately 3:1 has been found in Post-operative wound infected patients. High testosterone and low estrogen levels have been held responsible for immunosuppression, an important factor for post-op wound infection. Anemia has been reported to increases the post-op wound infection rate through hypoxia and by deranged tissue perfusion. The infection rate is found to be very high in post-op patients with haemoglobin less than 10%. Diabetic patients are reported to be more prone to infection when compared to non-diabetic persons. It has been reported that post-op wound infection rates were higher in uncontrolled diabetes with ketoacidosis.¹⁰ The effect of diabetes is more in geriatric age, presence of septic focus and generalized debilitation. The duration of preoperative hospitalization has a direct relation with postoperative wound infection. As the duration of preoperative hospitalization increases the normal bacterial flora of the patient is replaced by resistant hospital flora.

The postoperative infection rate has also been found to be associated with the duration of surgery. The infection rate has been reported to double with prolongation of every hour of surgery. No significant rise in postoperative infection rates has been reported if the duration of surgery is less than 2 hours. An increased incidence of postoperative wound infection has been associated with the use of drains by Cruse and Food.

Post-operative wound infection was reported to have a male inclination probably due to higher exposure in environmental conditions in males and association with risk factors. Various risk factors consist of diabetes, obesity, malnutrition, hygienic conditions, and presence of infective foci and prolonged duration of the surgery. The incidence of postoperative wound infections has also been found to be associated with antibiotic prophylaxis, skin preparations, surgical techniques and the methods of wound closure.

CONCLUSION

The present study strengthened the association of anemia, diabetes, nature of the surgery, the urgency of surgery, duration of surgery, and the use of drains on the incidence of

infection with statistically significant findings. The present study illustrated the changing pattern of wound infection toward mixed infection.

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