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A Study to Evaluate Microbiological Profile of Surgical Site Infections

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Abstract: ***Introduction: surgical site infections are quiet common in our country which increases morbidity, mortality and treatment cost. Isolating the micro-organisms associated with these infections is important so that effective management can be done. Aims And Objectives: To know the microbiological profile of surgical site infections. Material and Methods: Total of 500 patients underwent elective abdominal surgeries with class I and class II operative wounds were included in this study. Swab from the surgical wound was sent for microbiological examination. Results: 6% of total samples were culture positive and pseudomonas aeruginosa was the most common organism isolated. Conclusion: pseudomonas aeruginosa was the most common organism isolated from infected surgical sites.***

Keywords: microbiological profile, pseudomonas aeruginosa, surgical site infections.

1. Introduction

Surgical site infections are quite common in developing countries like ours, which not only increase the morbidity and mortality but also length of hospital stay and treatment cost. Therefore the knowledge regarding the micro-organisms responsible for surgical site infections is important, so that effective strategies can be made to counter this problem.

2. Aims and Objectives

1) To know the incidence rate of surgical site infections in surgical ward.
2) To know the commonest organism causing surgical site infection.

3. Materials and Methods

A cross-sectional observational study conducted at Department of surgery RIMS, Ranchi. Total 500 patients were included in this study from October 2019 to September 2021.

Inclusion criteria:
1) Patients admitted in surgical wards undergoing elective abdominal surgery.
2) Clean surgeries (Class I operative wounds) and Clean contaminated surgeries (Class II operative wounds) [1].

Exclusion criteria: Contaminated surgeries (Class III operative wounds) and dirty surgeries (Class IV operative wounds).

A wound was considered to be infected if any one of the following criteria was fulfilled [2, 3].
1) Serous or non purulent discharge from the wound;
2) Pus discharge from the wound;
3) Serous or non purulent discharge from the wound with signs of inflammation (oedema, redness, warmth, raised local temperature, tenderness, indurations).

Sample collection: The swabs were obtained from deep inside the wound avoiding contact with skin under all aseptic precautions [4, 5].

4. Results

Out of the total 500 patients taken in this study who fulfilled the inclusion criteria as well the definition of wound infection, 30 samples were culture positive (6%).

Table 1: Micro-organisms isolated

Micro-organisms isolated	Number	Percentage
Pseudomonas aeruginosa	15	50%
E. coli	6	20%
CoNS	4	14%
Staphylococcus aureus	2	6%
MRSA	2	6%
Enterobacter spp	1	3%

CoNS – Coagulase-negative staphylococci

Out of 30 culture positive samples, pseudomonas aeruginosa was most commonly isolated (50%), followed by E. coli (20%), CoNS (14%), Staphylococcus aureus (6%), MRSA (6%) and Enterobacter spp (3%).

5. Discussion

In our country, because of poor medical infrastructure, indiscriminate use of antibiotics, over burdened wards increases the risk of development of surgical site infections.

Surgical site infections (SSI) occur either due to exogenous or endogenous infections even after proper post-operative care.
Surgical site Infection rate was 6.00% in this study.

This is comparable with the rates reported by various authors (Table-2).

The higher rates reported by some authors may be due to the inclusion of contaminated and dirty wound types and also emergency surgeries in their studies [9, 10].

Table 2: Findings of the various similar studies

Study	Incidence of surgical SSI	Gram positive organisms	Gram negative organisms
Patel S 2012 B. J. Medical College, Ahmedabad, Gujarat [6]	16% (32/200)	CoNS (14.3%) S. aureus (7.1%)	E. coli (35.7%), Klebsiella sp. (21.4%), P. aeruginosa (14.3%), Proteus mirabilis (7.1%)
Sharma 2011 teaching hospital of northeast India [7]	21% (14/66)	S. aureus MRSA 67% MSSA 33%	E. coli ESBL (43%), ESBL + Amp-C hyperproducers (29%), Amp-C hyperproducers (14%), NDM-1 producer (14%)
Bhatia 2003 P D Hinduja National Hospital and MRC, Mumbai [8]	18.7% (116/615)	S. epidermis (42.24%) MMSE (26.72%), MRSE (15.5%)	Total (12.06%)-E. coli, P. aeruginosa
GMC NANDED 2017	6.01% (99/1645)	CoNS (8%) MRSA (3%)	Pseud. Sp. (41%), E. coli (20%), Klebsiella Sp. (11%)

6. Limitations of the study

1) Small sample size compared to earlier studies.
2) Those patients who were in incubation period during hospital course and presented with infection after discharge were not included.

7. Conclusion

Based on this study it can be concluded that surgical site infections are quiet common. Pseudomonas aeruginosa being the most common organism isolated from surgical sites.

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