

Study of Aerobic Bacteriological Profile of Surgical Site Infections with Antibiogram

Dr. Divya Kakumanu¹, Dr. Pedapati Kasturi^{2*}, Dr. D. S. Murty³, Dr. K. R. L. Surya Kirani⁴¹Post graduate, Department of Microbiology, Rangaraya Medical College, Kakinada, Andhra Pradesh, India²Associate Professor, Department of Microbiology, Rangaraya Medical College, Kakinada, Andhra Pradesh, India³Associate Professor, Department of Microbiology, Rangaraya Medical College, Kakinada, Andhra Pradesh, India⁴Professo & HOD, Department of Microbiology, Rangaraya Medical College, Kakinada, Andhra Pradesh, India

*Corresponding author: Dr. Pedapati Kasturi

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Abstract

Original Research Article

Surgical site infections are defined as an infection in the tissue of incision or the operative area that can commonly occur between 5th to 30th days post-surgery.²nd most common nosocomial infections. They are responsible for increasing the length of hospital stay, treatment cost, significant morbidity and mortality. This is a Prospective study of the data from patients who underwent surgery between July 2018–September 2018, from Obgy, Surgery & Orthopedic departments in GGH, Kakinada. Isolation & identification of aerobic organisms was done by Gram Stain & Culture Growths. Antibiotic susceptibility testing was done by Kirby Bauer disc diffusion method and the results interpreted were as per CLSI guide lines. Out of 1260 patients, who underwent surgeries from Obs & Gynec, Surgery, Orthopedics departments in a Tertiary care hospital, 80 cases which showed clinical signs of Surgical site infection were included in the study. The infection was found to be higher in females of 21-30yrs age group than in males. Most commonly isolated pathogens were Pseudomonas (23%), followed by Escherichia coli (17.5%). Antibiotic profile of Gram Positive isolates revealed highest sensitivity to Piperacillin tazobactem followed by linezolid whereas Gram Negative isolates showed most sensitivity to Amikacin and Meropenem. The study reveals that Infection Control Policies, proper hand hygiene techniques and optimal Peri-operative patient care can be implemented to reduce the incidence of surgical site infections.

Keywords:-SSI, Nosocomial infection, Gram Negative bacilli, Infection control policies, Peri-operative care.

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INTRODUCTION

Surgical Site Infections are defined as an infection in the tissues of Incision & operative area that can commonly occur between 5th _30th days after surgery [1]. They are the 2nd most common cause of nosocomial infections [2], resulting in sepsis, limb loss, prolonged hospital stay, increased mortality & morbidity [3]. The progression of a wound to an infected state is likely to involve a multitude of microbial and host factors, including the type, site, size, depth of the wound, the extent of contamination, the level of blood perfusion to the wound, general health, immune status of the host, the microbial load and the virulence of the microorganism's involved⁴. The present study was undertaken to study the Aerobic bacteriological profile of surgical site infections with their Antibiogram.

MATERIALS & METHODS

The present study was undertaken in the Department of Microbiology, Rangaraya Medical

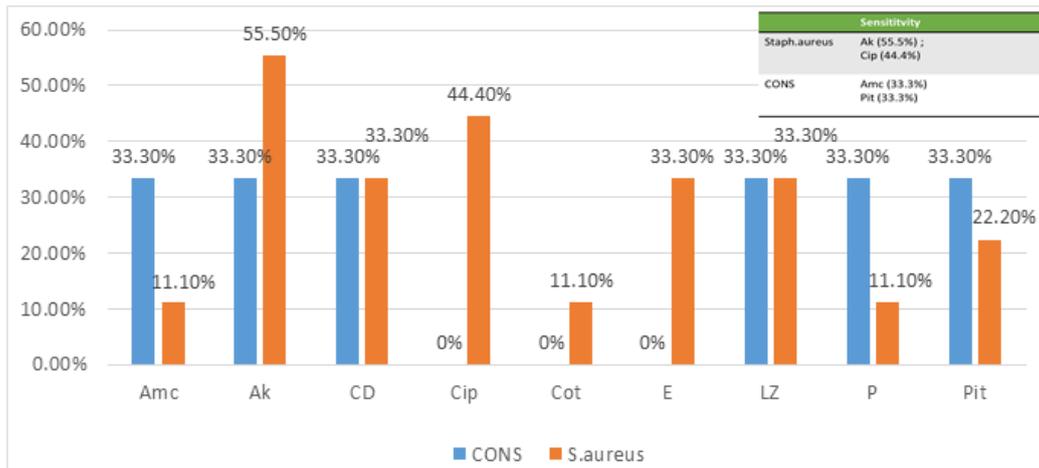
College, and Kakinada from July 2018- September 2018. It is a Prospective study.

Out of 1260 patients, who underwent surgery from Obsterics & gynaec, Surgery, Orthopedics? Departments in a Tertiary care hospital, 80 cases which showed clinical signs of surgical site Infection were included in the study. After Institutional Ethical Clearance, Informed consent from patient, 2 Fresh pus samples were collected following standard techniques. The samples are processed by Microscopy, incubated into BHI broth, Cultured on to Blood agar, MacConkey Agar, Nutrient agar, Antibiotic Susceptibility Testing was done by Kirby bauer disc diffusion Method & result was interpreted as per CLSI guidelines.

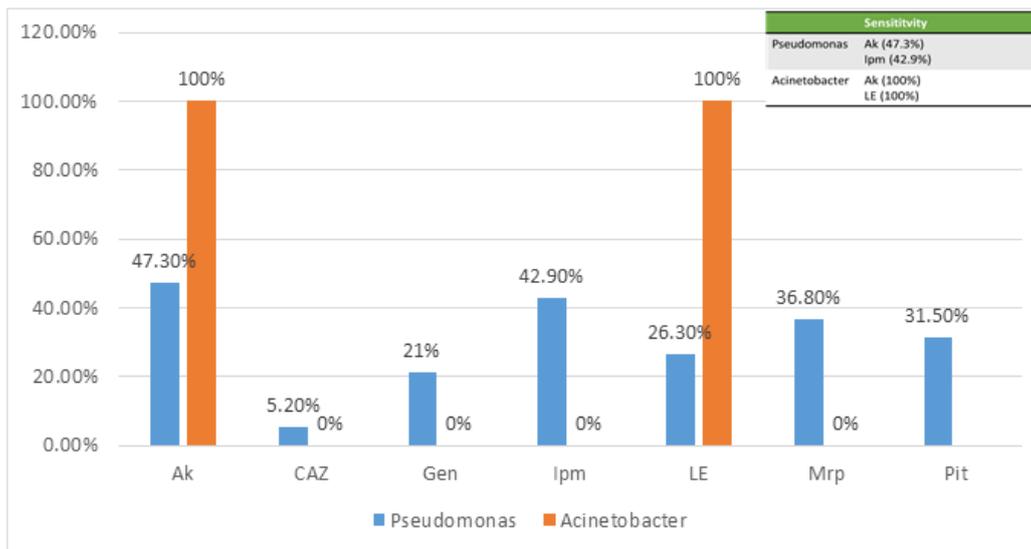
Inclusion criteria

- Patients presenting with signs of infection after 5th post-operative day
- Patients with Pus at surgical site
- Scar tenderness

Antibiotic Susceptibility for Gram positive Cocci



AST for Non-Fermenters (Pseudomonas, Acinetobacter)



AST for Enterobacteriaceae

	AMC	AK	CIP	CoT	CTR	IMP	LE	PIT
Escherichia coli	7.14%	21.4%	21.4%	28.5%	7.14%	7.14%	0	42.8%
Klebsiella sp.,	8.3%	41.6%	0	41.6%	8.3%	25%	25%	83.3%
Providencia sp.,	0	100%	0	0	0	0	0	0
Citrobacter sp.,	0	28.5%	71.4%	14.2%	57.1%	42.8%	57.1%	57.1%
Enterobacter sp.,	0	0	50%	50%	50%	100%	50%	100%

	Present Study	Mengesha <i>et al.</i> [6]	Selva raj S, Rathinam TVP, Chnadrahasan A <i>et al.</i> [5]	Vikrant Negi <i>et al.</i> [7]
1. Number of Positive samples (72 out of 80)	90%	75%	76.3%	96%
2. Sex ratio Males Females	45% 55%	76% 23.4%	56.6% 43.3%	74.6% 25.5%
3) Common isolates	Pseudomonas (23%) Escherichia coli (17.5%)	Staphylococcus aureus (35.7%) Klebsiella (22.76%)	Escherichia coli (21.2%) Staphylococcus aureus (17.5%)	Staphylococcus aureus (50.4%) Escherichia coli (23.02%)
A.S.T Gram positive cocci	S – Amikacin (55%) Ciprofloxacin (44%) R- Ampicillin (66.6%)	S- Gentamicin (83%) Vancomycin (80%) R- Tetracyclines (90%)	S- Imepenem Cefepime (82.4%) R-Ampicillin (100%)	S- Vancomycin Amikacin (75%) R-Ampicillin (65%)
Gram Negative bacilli-	S- Imepenem, Piperacillin – Tazobactam R- Ampicillin, Amoxicillin-clavulanic acid	S- Piperacillin-Tazobactam Gentamicin R- Ceftriazone Ampicillin		

DISCUSSION

In the present study, number of positive samples is 90%, which coincided with Vikrant Negi *et al.*[7]-, out of 1260 cases, 80 cases were Surgical site infected cases, 55% were females, 45% were males, the infected was found to be higher in the age group of 21-30years. Most Commonly isolated pathogens were Pseudomonas & Escherichia coli [5], which coincided with Selvaraj S, Rathinam TVP, Chandrahasan *et al.*

Antibiotic profile of Gram positive isolates revealed highest sensitivity to Amikacin (55%), Followed by Ciprofloxacin (45%), highest resistance is seen to Ampicillin (66.6%), which Coincided with Vikrant Negi *et al.* (65%)[7].

Antibiotic profile of Gram Negative bacilli, showed highest sensitivity to Piperacillin Tazobactam, highest resistance to Ampicillin, which coincided with Mengesha *et al.*[6]

CONCLUSION

- Multidrug resistant organisms are increasingly implicated in the causation of surgical site infections; they are responsible for increased mortality & morbidity.
- Proper peri operative, operative & post-operative care is essential for reduction of surgical site infections.
- Hygienic hand wash, Infection control policies, Proper continuation & usage of antibiotics lead to decline of surgical site infections.

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