The Pharma Innovation Journal 2019; 8(7): 133-136

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2019; 8(7): 133-136

www.thepharmajournal.com
Received: 04-05-2019
Accepted: 06-06-2019

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Anti-microbial status update on surgery at tertiary care teaching hospital

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Abstract
Surgery is the branch of medical science that employs operation in the treatment of particular disease (or) injury. Where the antibiotics play the major role as prophylaxis and treat the infection. This study aimed to analyse the antibiotic sensitive and resisted pattern of each organism similarly in different type of surgery in the duration of three month, the observational study was conducted in the department of surgery at RMMCH, Annamalai University with the subjects of 42 patients. The data's required were collected from the patient information sheets. From this study the followings were concluded, P. mirabilus (17%), Klebsiella 39%) were the mostly observed organisms' accordingly gram positive and negative.

Keywords: Antibiotic sensitive pattern, surgical category, surgical organisms

Introduction
Surgery is the branch of medical science that employs operation in the treatment of particular disease (or) injury. Where the anti-microbial (or) antibiotics plays the major role as prophylaxis and treat the infection.

Surgical antibiotic prophylaxis is defined as the use of antibiotics to prevent the risk of infection at surgical site. Certainly, wound infection are the most commonest hospital – acquired infection in surgery patients, in addition to they result in increase antibiotic usage, besides increase the cost and stay of hospital.

Though, an appropriate therapy of prophylaxis could mitigate the risk of post operative wound infection, the surplus use of anti-biotic could increase the emergence of antibiotic resistance. Surgical site infection are the third (14%-16%) most frequent cause of nosocomial infection among the hospitalized patients even though, a complete and optimized therapy can successfully eradicate the surgical site infection.

Aim & Objectives
To assess the antibiotic sensitive status in surgery wards of RMMCH

Objective
- To document the prophylactic antibiotics currently prescribed in surgery
- To document the antibiotic sensitivity pattern
- To document the pathogens causing surgical site infection.

Methodology
The 3 month observational study was conducted in the department of surgery at Raja Muthiah medical college and hospital, Annamalai Nagar. total of 42 surgery patients were enrolled in this study.

Inclusion
Patients those who underwent various surgical procedure & prescribed with antibiotic

Exclusion
Out patients
Thos are not willing to participate.

Results

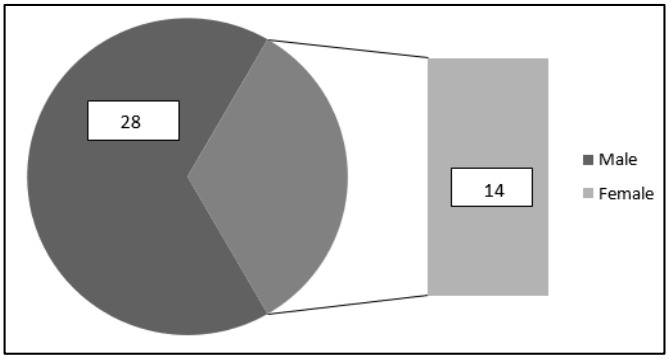

Fig 1: Gender Wise Distribution

The above table indicate that male patients were more 28 and female were 14 only

Table 1: Age Wise Distribution

S. No	Age Group	No. Of Pt's	Percentage
1	10-20	5	11%
2	21-30	6	14%
3	31-40	4	9%
4	41-50	9	21%
5	51-60	5	11%
6	61-70	9	21%
7	71-80	4	9%

This table indicates 41-50 and 61-70 age groups was highly prevalent

Table 2: Disease Pattern in Surgery

S. No	Diagnosis	No. Of Cases	Percentage
1	Leg Cellulitis	6	14%
2	Abcess	3	7%
3	Diabetic Foot	16	38%
4	Appendicities	9	21%
5	Hernia	6	14%
6	Fourniers Gangrene	2	4%

Diabetic foot was the most observed case 10(38%).

Table 3: Types of Surgical Procedures

S. No	Type of Surgery	No. Of Cases	Percentage
1	Wound Debridemengt	16	38%
2	Hernioplasty	6	14%
3	Appendectomy	9	21%
4	Fasciotomy	2	4%
5	Incision Drainage	3	7%
6	Surgical Skin Graft	6	14%

The table indicates most employed method as wound debridement

Table 4: Isolated Culture Organisms

Bacteria	No. Of Cases	Percentage
Gram Positive Aerobes	7	24%
Staphylococcus Aureus	2	6.8%
Protease Mirabilus	5	17%
Gram Negative Aerobes	22	75%
Klebsiella	10	34%
Pseudomonas	7	24%
Proteus vulgaris	4	13%
E. coli	1	3.4%

In gram positive proteus mirobilus was most observed organism (5)17%, On the other hand gram negative klebsiella was the most one 10 (34%)

Table 5: Antibiotic Sensitivity Pattern of Proteus mirabilus

Antibiotic	Sensitive %	Resistance %
Amikacin	66.66	33.34
Gentamicin	66.34	33.66
Ciprofloxacin	100	0
Oflaxacin	66.66	33.34
Norfloxacin	33.34	67.66
Ampicillin	33.34	66.66
Cefotaxime	71.34	28.66
Amoxicillin + Clavulanic Acid	33.34	66.66

Ciprofloxacin is the highly sensitive drug for proteous mirabilus and Norflaxacin is the most resistance drug for the same

Table 6: Antibiotic Sensitivity Pattern of Staphylococcus aureus

Antibiotic	Susceptible (%)	Resistance (%)
Amikacin	66.66	33.34
Gentamicin	66.34	33.66
Ciprofloxacin	66.66	33.45
Oflaxacin	100	0
Norfloxacin	100	0
Ampicillin	33.34	66.66
Cefotaxime	48.67	31.33
Pefloxacin	-	-
Erythromycin	0	100
Cloxacillin	-	-
Vancomycin	0	100

Of loxacine, norfloxacin were the highly sensitive drugs and Erthromycin, Vancomycin was the highly resistance drugs.

Table 7: Antibiotic Sensitivity Pattern of Proteus Vulgaris

Antibiotic	Sensitive %	Resistance %
Amikacin	100	0
Gentamicin	34.36	65.64
Ciprofloxacin	-	-
Oflaxacin	0	100
Norfloxacin	66.66	33.34
Ampicillin	0	100
Cefotaxime	100	0
Amoxicillin + Clavulanic Acid	0	100

Amikacin, Cefotaxame were the most sensitive drugs and Amoxcillin, Ofloxacin were the mostly resistant drugs.

Table 8: Antibiotic Sensitivity Pattern of Klebsiella

Antibiotic	Sensitive %	Resistance %
Amikacin	78.94	21.05
Gentamicin	31.57	68.42
Ciprofloxacin	89.47	10.52
Oflaxacin	42.10	57.89
Norfloxacin	57.89	42.10
Ampicillin	10.52	89.47
Cefotaxime	73.68	21.32
Pefloxacin	31.57	68.43
Ceftriaxone	50	50

Ciprofloxacin, Ampicillin were the highly sensitive and Ampicillin was the highly resistant to the organism.

Table 9: Antibiotic Sensitivity Pattern of Pseudomonas

Antibiotic	Sensitive %	Resistance %
Amikacin	100	0
Gentamicin	57.14	42.85
Ciprofloxacin	78.57	21.43
Oflaxacin	50	50
Norfloxacin	71.43	28.57
Ampicillin	0	100
Cefotaxime	50	50
Ceftriaxone	85.71	14.92
Amoxicillin + Clavulanic Acid	14.29	85.71

Amikacin, Ciprofloxacin were highly sensitive and Ampicillin, Amoxacillin were highly resistant to the organism.

Table 10: Antibiotic Sensitivity Pattern of *E. coli*

Antibiotic	Sensitive %	Resistance %
Amikacin	100	0
Gentamicin	66.34	33.66
Ciprofloxacin	78.57	21.43
Oflaxacin	25	75
Norfloxacin	71.43	66.66
Ampicillin	16.67	83.33
Cefotaxime	66.34	33.66
Pefloxacin	25	75
Amoxicillin + Clavulanic Acid	33.35	66.66

Amikacin, Ciprofloxacin were highly resistant and Ampicillin was highly resistant.

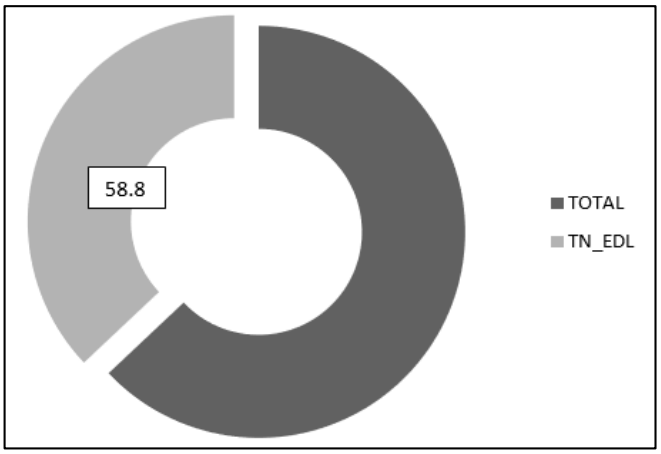

Fig 2: Percentages of Antibiotics Belonging to The Essential Drug List

From the above pie chart 58.8 % of patient was prescribed in complies with Tamil Nadu essential drug list.

Table 11: Types of Drug Combination Selected For Antibiotic Prophylaxis

S. No	Types of Drug Combination	No of Cases
1	Single drug (Cefotaxime)	33
2	combination	9

Discussion

- A total of 42 patients were enrolled into the study.
- Patients between 10-80 years of age were taken into study and majority of the patient enrolled were 41-50.
- Majority of patients underwent wound debridement 16 (38%).
- Out of total bacteria isolated 24% were gram positive and 75% were gram negative. Of them klebsiella (34%) and pseudomonas (24%).
- In *P. mirabilus* Ciprofloxacin was the highly sensitive (100%) and norfloxacin was the mostly resistance (67.66%)
- In *S. aureous* ofloxacin, norfloxacin were highly sensitive (100%) and Erthromycin, Vancomycin were most resistance (100%).
- In *P. vulgaris* Amikacin, Cefotaxime were the highly sensitive (100%) and Oflolaxacin, Ampicillin, Amoxicill were most resistance (100%)
- In klebsiella Ciprofloxacin was the mostly sensitive (89.47%) and Ampicillin (89.47%) was the most resistance
- In *P. seudomonas* Amikacin was the highly sensitive (100%) and Ampicillin was most resistance
- In *E. coli* Amikacin was the highly sensitive (100%) and Ampicillin was most resistance (83.33%)
- Our study we found that (58.8%) of prescription has TN-EDL drugs.

Conclusion

- The regimen followed in RMMCH is much efficient in providing prophylaxis
- Cephalosporins is the most selected class of drug for the prophylaxis
- Klebsiella was the most frequent bacteria isolated in the study followed by the pseudomonas
- A single drug is most commonly selected to provide prophylaxis than the two drug or three drug combination

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