

“Guidelines for Rational Prescription of Antibiotic in the hospital”

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INTRODUCTION

In a hospital, surgical site wound infection are the commonest hospital acquired infection in surgical patients. Approximately 30-40% of antibiotics used in hospital is for surgical prophylaxis. So appropriate prescription of antibiotic is needed for an efficient treatment.

Antibiotic resistant is the major concern for healthcare industry across the world and it's very important to ensure appropriate use of antibiotics.

Inappropriate uses of antibiotics not only increase the cost of healthcare for patient, but also lead to develop multidrug resistant infection.



Thus under the guidance of Departmental HOD's, Infection Control Committee, and Microbiologist an antibiotic policy was formulated to ensure the appropriate use of antibiotics.

This study was conducted in a multispecialty tertiary care hospital, Hyderabad, the hospital currently has 150 operational bed and an average of 5016 out patients and 626 inpatient admission monthly. Inpatient total number 18-20% patients are particularly of gastroenterology department and approx 70% of this no. goes for surgery and antibiotics every month.



Problem Statement :

In a multispecialty tertiary care hospital particularly using the previously dated antibiotic policy which is focusing on a single speciality has its own inefficiency for the other speciality, so new and upgraded antibiotic policy requirement thus is necessary, to ensure the appropriate use of antibiotics.

OBJECTIVE :

- 1.To assess the rational use of antibiotics in the hospital.
- 2.To create an awareness among the hospital consultant and to save uses of powerful antibiotics for later treatment.

METHODOLOGY :

Duration of study - 3 months from a period of 8th feb to 8th may 2016.

Type of study – A retrospective study was conducted and data was captured for year 2014-2015.

Data collection- Data was collected through patient file, doctor Interview, and antibiogram report. The data was collected only for those surgical patient, samples were sent to microbiology department for study.



Data requirement- a. List of all 131 patient whose samples showed a positive result.

b. Culture report of above mention patient.

Method- Analysing antibiogram report which involve following point.

a. Blood sample sent for testing antibiotics in last 1 year (2014-2015).

b. Culture report available suggesting for prescribed antibiotics.

c. Patient prescription as per mention above.



Sample size- 131 patients blood sample available in hospital.

Inclusion criteria- Blood sample of all surgical patient in gastroenterology department.

Exclusion criteria- Pus sample
Wound swab
Drain discharge



Limitations of the study

The results of the present study needs to be further supported by taking a more representative sample size, for which 2-3 year back retrospective data need to be studied.

The hospital antibiogram cannot be used alone to select the optimal empiric therapy in an individual patient, as specific patient factors need to be considered, including the type and severity of infection, the infecting organism, and the patient's medical history and past antibiotic use



ANALYSIS :

Hospital antibiotic policy is a comprehensive document which is based on following parameter-

1. Antibiogram
2. Current literature Available
3. International & NABH guidelines

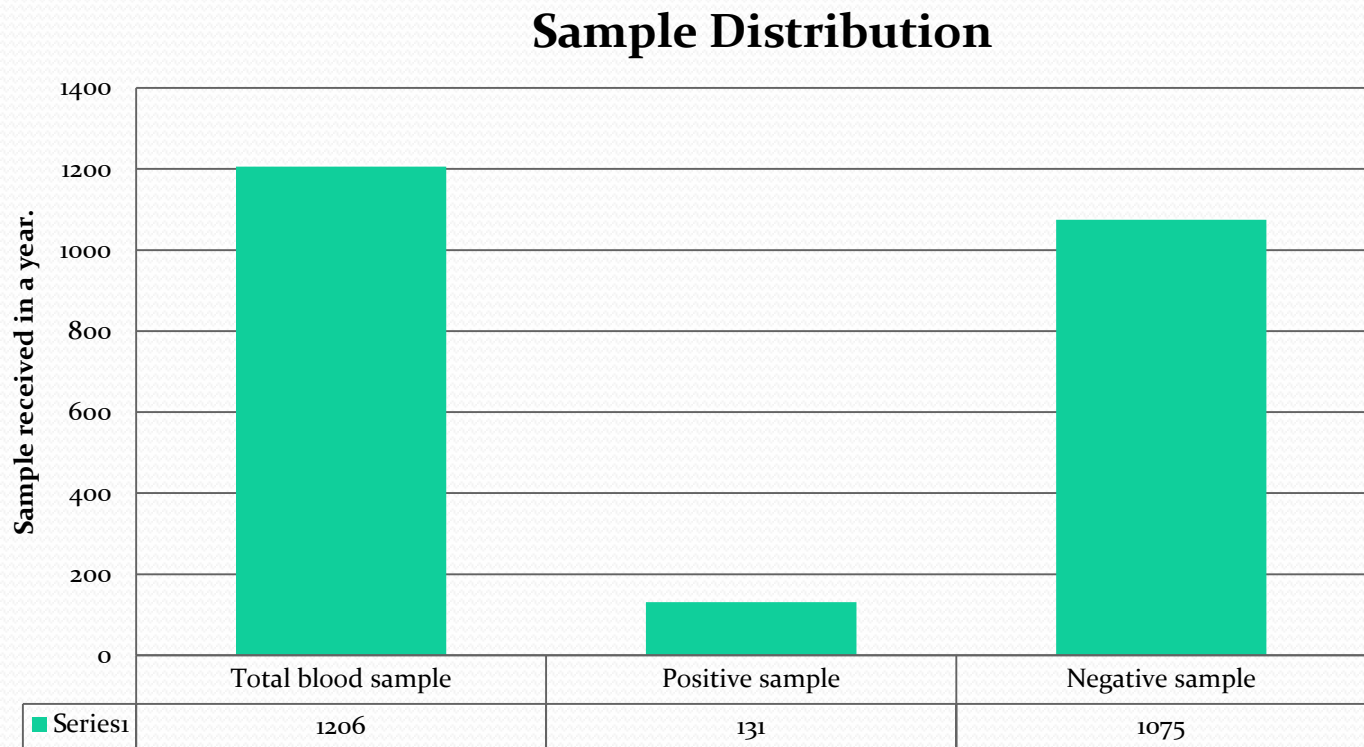
Results based on Analyse of entire year data which suggested the antibiotic policy:

In the year 2014-2015 a total of 1206 blood culture specimens were received in the microbiology department, out of this 131 blood culture were positive.

Antibiograms were prepared for species with minimum 30 isolates are present.

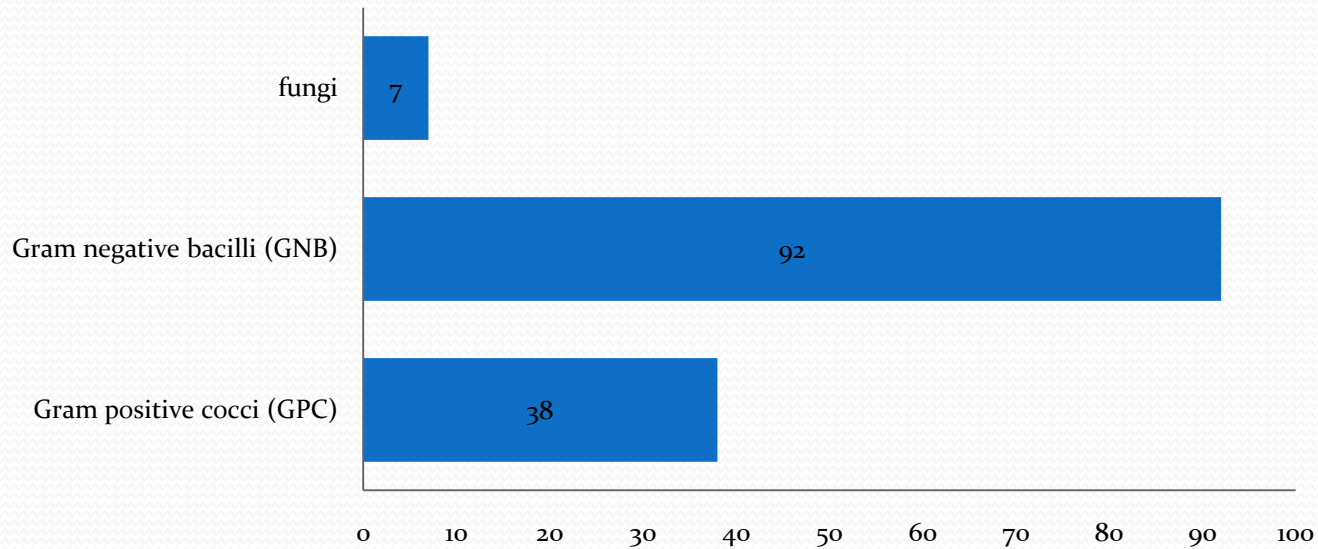
A particular antibiotic was considered for inclusion in the antibiotic policy only if it has a percentage susceptibility of $\geq 40\%$. (as per CLSI M39-A2 guidelines)

Graph :1 Total sample received for entire year and its distribution



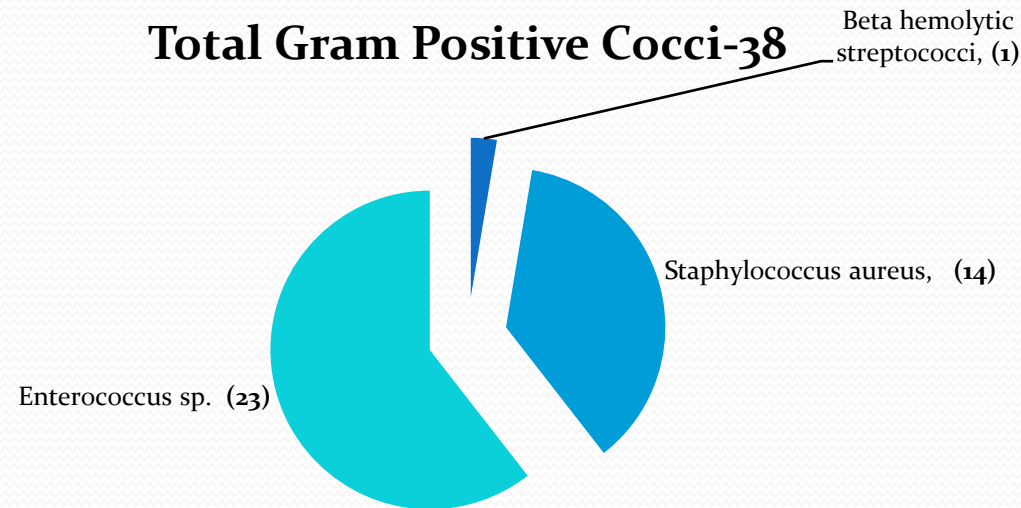
Graph:2 shows the total no. of isolates present in the sample

Total isolates present in positive sample-137



Out of total 137 isolates , 38 are the gram (+ve) cocci, 92 are the gram(-ve) bacilli ,and 7 are the fungal growth .So data shows the majority of the gram (-ve) infections.

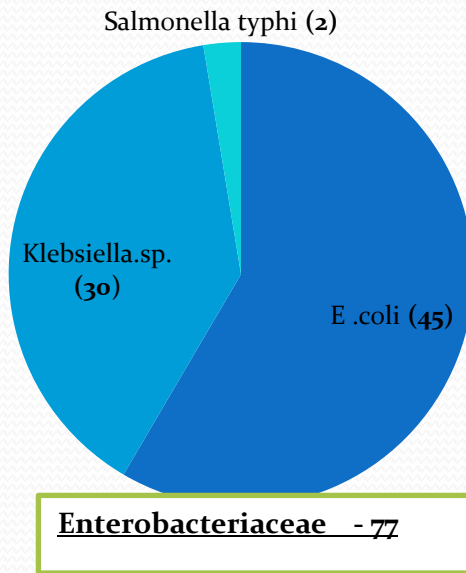
Graph:3 shows the distribution pattern of Gram (+ve) cocci



Out of 38 gram(+ve) cocci ,1 is beta haemolytic streptococci, 14 is staphylococcus aureus, 23 is enterococcus. Antibiotic test on these isolates shows 12 are MRSA, 10 are HLAR, and 3 are VRE.

Graph:3 shows the distribution of gram(-ve)bacilli

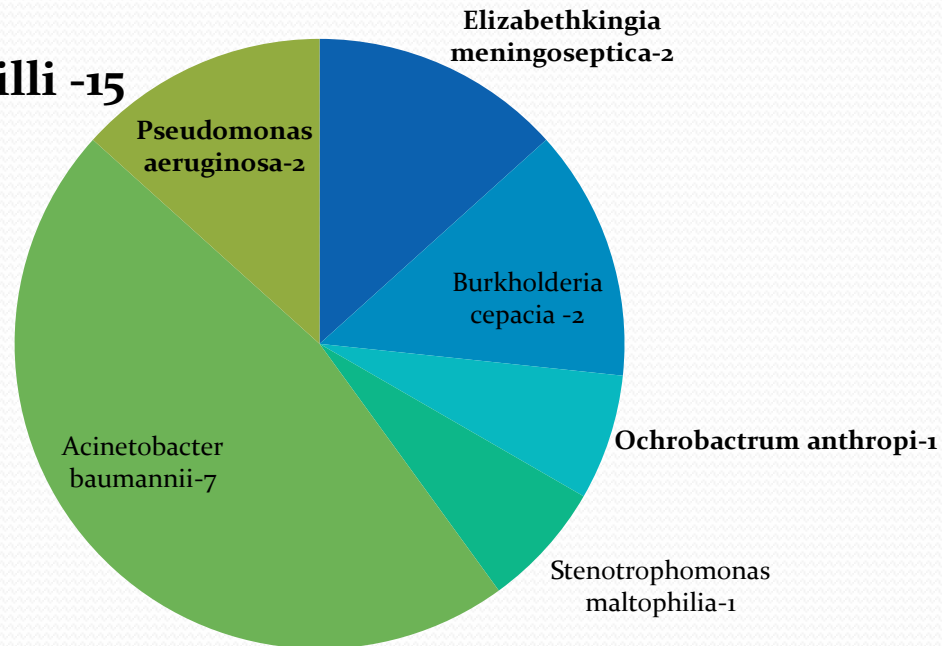
Total Gram Negative Bacilli - 92



Total no. of gram (-ve) bacilli present are 92 out of which 77 are Enterobacteriaceae and 15 are other species. Out of 77 Enterobacteriaceae, 45 are E.coli, 30 are Klebsiella and 2 are salmonella typhi. It shows the no. of infection are more with E.coli and Klebsiella (>30) each individual. Antibiotic test on these isolates shows 44 are ESBL and 19 are CRE.

Graph:4 Distribution of other Gram(-ve) bacilli

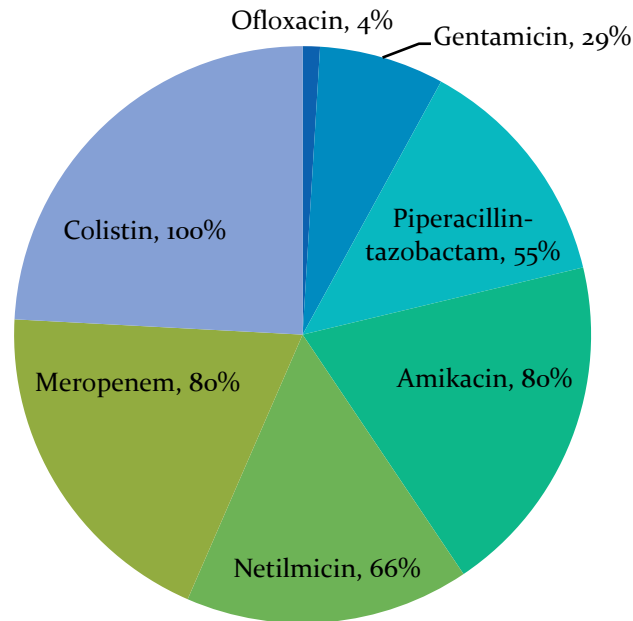
Other Gram (-ve) Bacilli -15



Other Gram Negative Bacilli	15
Elizabethkingia meningoseptica	2
Burkholderia cepacia	2
Ochrobactrum anthropi	1
Stenotrophomonas maltophilia	1
Acinetobacter baumannii	7
Pseudomonas aeruginosa	2

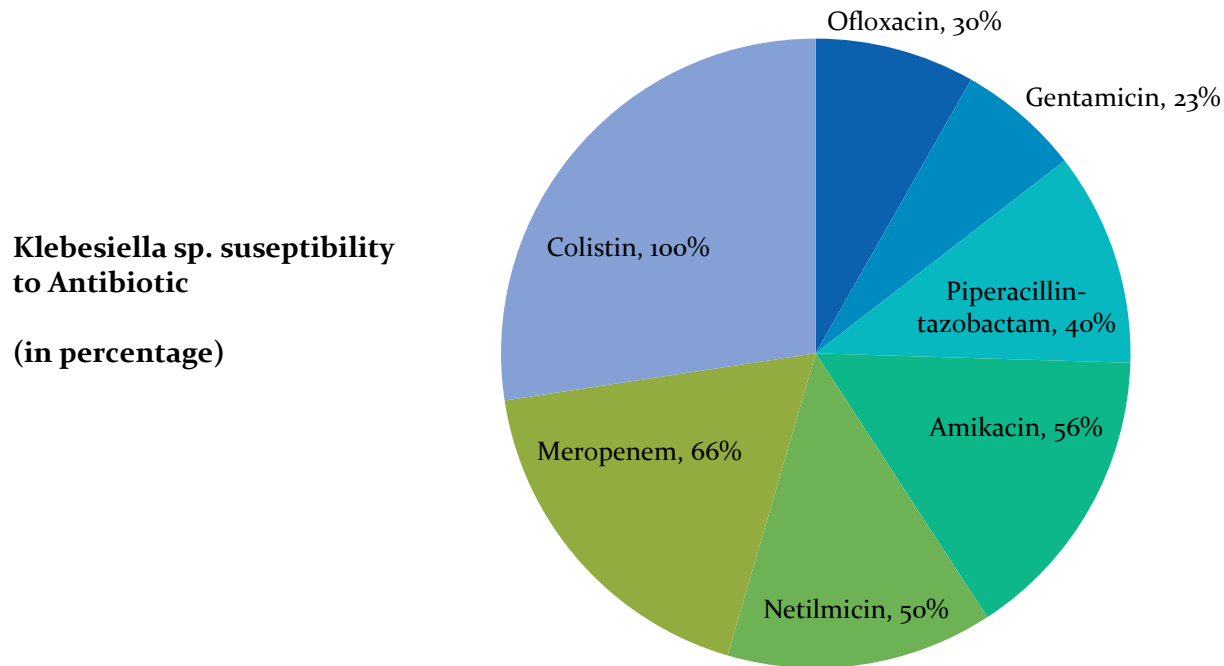
Graph:5 Shows percentage susceptibility of E.coli to Antibiotics

E-coli bacteria susceptibility
to Antibiotic
(in percentage)



Drugs for which bacteria is susceptible more than >40% is mostly effective against it, so drugs like Piperacillin-tazobactum, Netilmicin , Meropenum, Colistin comes under it ,whereas Ofloxacin and Gentamicin are showing less sensitivity for them.

Graph:6 Shows percentage susceptibility of Klebsiella to Antibiotics



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Existing hospital prescription for Antibiotic – Based on surgery

Laparoscopic surgery - Ofloxacin

Bowel surgery - Cefoperazone salbactam

Hepato-Pancreato-Biliary - Piperacillin+ tazobactam

Hernia surgery - Amoxycillin+clavulanic acid

As per the new policy: guidelines are as follows

1-Antibiotics

Class

Generic name

Brand name

Dose

2-List of restricted drug (higher antibiotics ex- meropenem, colistin)

3-Hospital formulary for antibiotics

4.Surgical prophylaxis policy

a. Pre operative Consideration:-

Consider individual risk factor –Drug choice and dose may alter based on patient condition (ex-immuno suppression, any allergy, diabetes, malignancy etc.)

Pre-existing infection- If present, use appropriate Tt. regimen instead of prophylactic regimen, and allow for re-dosing just prior to skin incision.



b. Peri operative:-

I.V bolus –timed <60 min before incision

I.V infusion –timed to end <30 minutes before incision

MRSA risk– replace Cephazolin or Penicillin with Vancomycin at the rate of 1gm/hr.

A single preoperative dose is sufficient for most procedure (however intraoperative doses are advisable) if a prolong surgery >4 hrs, or extensive amount of blood lose.

c. Post operative:-

post operative antibiotics are not indicated unless infection is confirmed or suspected. If infection is suspected, consider modification of antibiotic regimen according to microbiology test report.

Findings:

1- As per the study it is evident that there is a gap in prescription of antibiotics by the consultant and as per the antibiogram recommendation.

2-In hospital mostly antibiotic was prescribed on the bases of type of surgeries performed, whereas according to the guideline it should be prescribed on the bases of type of infection and patient condition.

3- Above data analysis shows the bacteria which are isolated from the hospital culture report has a very low sensitivity for ofloxacin and gentamicine which is prescribed by consultant in most of the laproscopic surgery.



4-One finding also came into picture, rather than sending blood sample of all the surgical patient only those patient samples where infection is more or patient condition is deteriorating were sent to the microbiology lab by the consultant.

5-Very few of consultant discuss with microbiologist for any change regarding the treatment plan, rather then they prefer to give broad spectrum antibiotic at the very beginning.

Suggestions:

Initial empirical treatment of bloodstream infections:

Gram negative bacilli: Piperacillin-tazobactam(% susceptibility>50, bactericidal) with a combination of amikacin/netilmicin (bacteristatic) can be given in the hospital.

Gram positive cocci in chains: Ampicillin with a combination of gentamicin/amikacin can be given, bactericidal effect.

Gram positive cocci in clusters: Vancomycin can be given against MRSA resistant bacteria in hospital.

Escalate or de-escalate antimicrobial therapy based on the final antimicrobial susceptibility testing report.



If a consultant is prescribing a higher antibiotic (ex Meropenum) in the hospital he/she should submit a justification form addressing the reason for prescribing it .

Pharmacist based on the frequency of the uses of higher antibiotic, should also give a report to hospital infection control committee about the uses.

*Thank
you*

