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Utilisation pattern of AMA in surgery department in a tertiary care hospital

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Abstract---In the recent past when people were dying of communicable diseases, the discovery and innovations of AMAs, did a miracle as saved millions of life worldwide, by special toxic and killing effect on infecting microorganisms and not damaging host, thus satisfying own name as MIRACLE MEDICINE or MAGIC BULLETS. Paul Ehrlich of Austria discovered first time chemotherapeutic agent in 1906. Next Domagk of Germany, A. Fleming of England, Walks man of USA discovered sulfonamides, penicillin, Streptomycin and all received NOBEL PRIZE, for their immortal lifesaving work which changed world. Data are collected from admitted patient's case sheets from surgery wards. Data's are collected by a self-prepared preformed proforma, which is prepared as per study design and includes Age, Sex, Disease, Unit, Ward, AMA or AMAs prescribed, Average no of AMAs, Dose, Frequency, Route of administration, along with Govt. supply or private purchase and supply chain.

Keywords---medicine, sulfonamides, surgery, antimicrobial.

Introduction

In the recent past when people were dying of communicable diseases, the discovery and innovations of AMAs, did a miracle as saved millions of life worldwide, by special toxic and killing effect on infecting microorganisms and not damaging host, thus satisfying own name as MIRACLE MEDICINE or MAGIC

BULLETS. Paul Ehrlich of Austria discovered first time chemotherapeutic agent in 1906. Next Domagk of Germany, A. Fleming of England, Walks man of USA discovered sulfonamides, penicillin, Streptomycin and all received NOBEL PRIZE, for their immortal lifesaving work which changed world. 90. [1] Thus we have powerful tools, guns to fight against pathogens and we call them MAGIC BULLETS as in crowd of enemy and friends, they selectively kill enemies but not our friendly cells like that of BELALSEN of MAHABHARAT-Who on asking by LORD KRISHNA, could recognize enemy and friends of his father BHIMSEN, without seeing them earlier by using a single arrow which can give red vermilion point to enemies head and black vermilion point to friendly party^[2]

Bacteria were first identified in the 1670s by van Leeuwenhoek, following his invention of the microscope. However, it was not until the nineteenth century that their link with disease was appreciated. This appreciation followed the elegant experiments carried out by the French scientist Pasteur, who demonstrated that specific bacterial strains were crucial to fermentation and that these and other microorganisms were far more widespread than was previously thought. The possibility that these microorganisms might be responsible for disease began to take hold. ^[3,4]

Having in mind the current progress of resistance spreading and resilience of larger and larger number of bacteria to traditional antibiotics as well as a way of transmitting the gene of resistance, above all via plasmids, one can conclude that the ability of obtaining bacterium resistance to antibiotics represents a very dynamic and unpredictable phenomenon. For that reason, bacterial resistance to antibiotics represents a major health problem. ^[5,6] Solving this problem and search for new sources of antimicrobial agents is a worldwide challenge and the aim of many researches of scientific and research teams in science, academy institutions, and pharmaceutical companies. One of the approaches in solving this issue is testing the biologically active compounds of plant origin ^[7,8]

Aims and Objectives

To find out rationality of Anti-microbial use in different IPD wards such as SURGERY of a tertiary care teaching hospital of eastern ODISHA- SCB.MC & HOSPITAL, CUTTACK, ODISHA

- To find out the antibiotics commonly prescribed I various conditions.
- To determine average number of AMA use for patients.
- To find out judiciousness of combinations of AMAs.
- To find out judiciousness of AMAs use by determining antibiotics prescribed irrationally and whether they prescribed in accordance to standard treatment guide line.
- To compare antimicrobial prescriptions, to determine multiple antibiotic prescriptions and disease conditions in which they are prescribed.
- To collect C/S report and see sensitivity and resistant pattern.
- To locate AMAs change as per report,
- To find out whether laboratory investigation were done before or after prescription of AMAs.

- To find out supply chain management.
- To find out Govt. supply or private purchase
- To find out prescriptions in brand and generic name.
- To find out ADRs in AMAs use.
- To determine whether prescription was for treatment or for prophylaxis.

Material and Methods

Methodology

Review of patient's folders, Asses drug availability from stores and pharmacy records, informal interview with prescribers, scrutiny of laboratory records and observations.

Study Design

Observational and Retrospective survey of AMAs usage.

Place of Study

SURGERY ward of SCBMC & HOSPITAL, Cuttack. It is a 3-tier Medical College and Hospital, in eastern Odisha, providing wide variety of Diagnostics and Specialist OPD and IPD Services as well as Teaching faculty. More than half of Odisha state along with West-Bengal and Bihar, Jharkhand population depend on it.

Study Period----Sept.—2013--- Dec. 2015

Sampling

Data are collected from admitted patient's case sheets from surgery wards

Data's are collected by a self-prepared preformed proforma, which is prepared as per study design and includes Age, Sex, Disease, Unit, Ward, AMA or AMAs prescribed, Average no of AMAs, Dose, Frequency, Route of administration, along with Govt. supply or private purchase and supply chain.

Proforma

Patients Name, age, sex, address	
Regd. No. Ward, unit' bed. No. unit head	
Disease Diagnosis	
AMA used Route, dose, Frequency, Duration	
Ward supply Yes or, no	
Market purchase Yes, or No	

Availability in ward Distribution point	
Availability in central store Ware house	
Availability in SDMU	
Changed AMA After C/S	

Inclusive Criteria

All Adult patients admitted to Surgery ward All prescriptions single or combination of AMAs is included. No age, sex, race, residence, addictions and habituations, socio-economic state, co-morbid condition, height, weight not taken into account, except weight, age and co-morbid conditions such as liver and renal failure taken to determine type and dose of AMAs.

Exclusion Criteria

Topical antibiotics, ointments, combination of antibiotics with steroids for local applications, ATT, HAART, Antineoplastic drugs, Antifungal antibiotics are not taken into study.

Data Collection

By a special self-prepared PROFORMA given above and IPC ADR form. (Indian pharmacopeia commission)

Datas Belongs To

- Patients Demography, addictions, habits
- Patients ward; unit etc.
- Diagnosis and condition of patient.
- Whether Microbiologic investigations, were done and confirmed prior to prescription.
- Whether prescriptions were for treatment or preoperative treatment or for prophylaxis.
- Single or multiple AMAs use.
- Logic behind AMAs prescription and combination.
- AMAs change after C/S.
- Patient's compliance and result of treatment.
- ADRs if any.
- Death if any.

Demographic Profile AMA Utilisation Pattern In General Surgical Dept.

CHART-1: age distribution in surgical patients

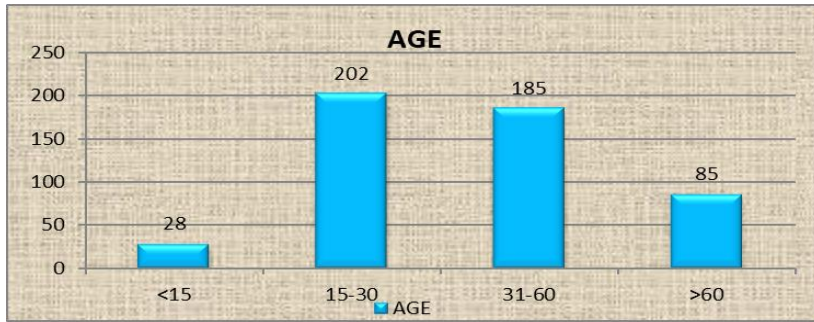


CHART-2: sex distribution in surgical patients



CHART-3: educational qualification of surgical patients

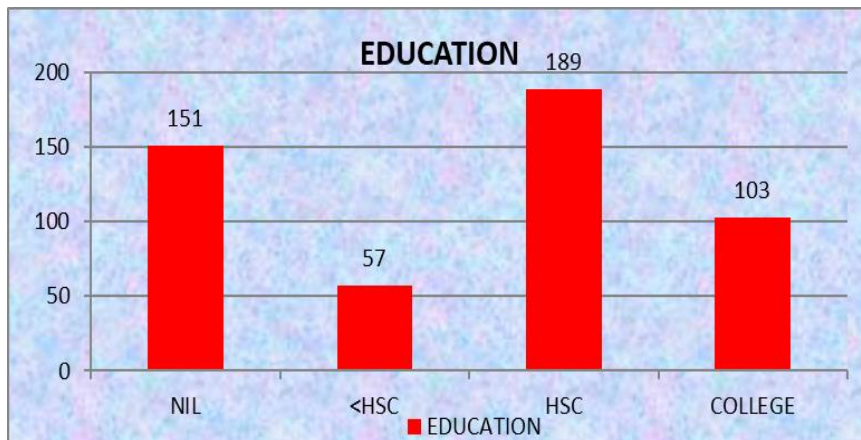


CHART-4: income status of surgical patients

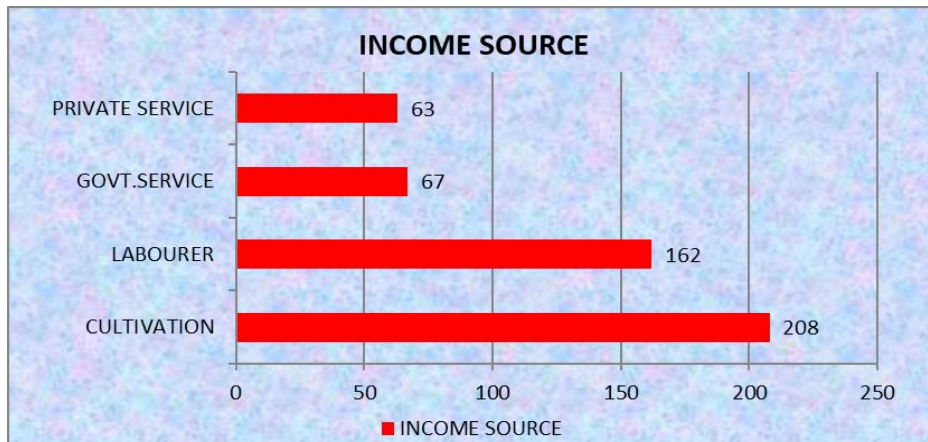


CHART-5: habits and addictions of surgical patients

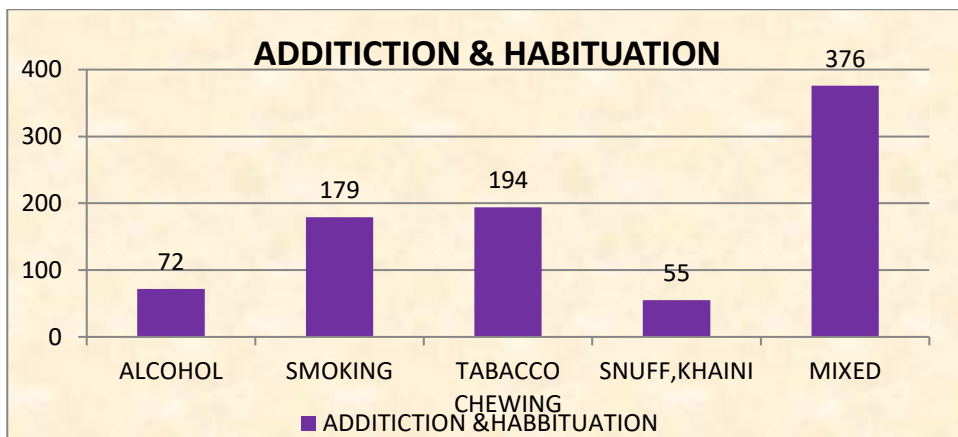
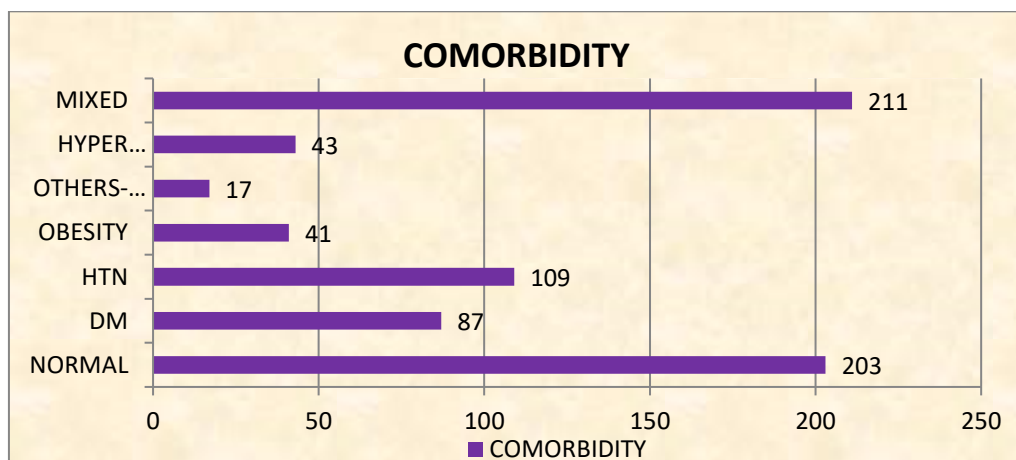


CHART-6 : comorbidity condition of surgical patients



Important general surgical cases

1. Necrotizing fasciculaitis Left Foot With Septicemia with DM
2. Necrotizing fasciculaitis Other Areas
3. Bear Manlings
4. Bear Manlings with Necrotizing Specified different area with low condition
5. Crocodile Manlings & in low condition
6. Bullock Horn Injury Abdomen , Perineum , Anal Canal
7. Entero cutaneous Fistula with fecal Peritonitis
8. Necrotizing Fasciculaitis with DM
9. Foot Ulcer-Leprosy
10. Foot ulcer-DM
11. Hepatic abscess left ,right lobe , Multiple abscess
12. Hydatid cyst – Liver
13. Necrotizing fasciculaitis with medical renal diseases
14. Hepatic Abscess with sub capsular rupture
15. Sigmoid colon Injury with Fecal Peritonitis
16. Multiple stab Injury Abdomen
17. Multiple stab Injury Abdomen with Pyo-abdomen
18. Multiple stab Injury Abdomen with Pyo-abdomen with Septicemia
19. Gallstone
20. Stone in CBD
21. Stone in CBD with jaundice
22. Acc. Pancreatitis
23. Strangulated Hernia with Intestinal Obstruction
24. Perforated intestine – typhoid , TB , Other causes with carcinoma
25. Intestinal Obstruction
26. Hernia
27. Peptic perforations
28. Peptic perforations –late cases
29. Different peptic operations
30. Different carcinomatous Operations
31. Splenectomy

CHART-7 : AMA used in preoperative surgery- surgical deptt. Prophylaxis treatment

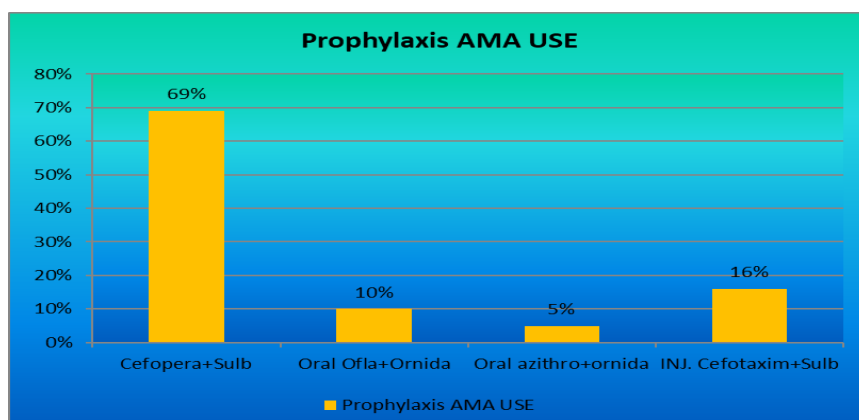


CHART-8 pre-operative infection treatment in surgical ward by different AMAs

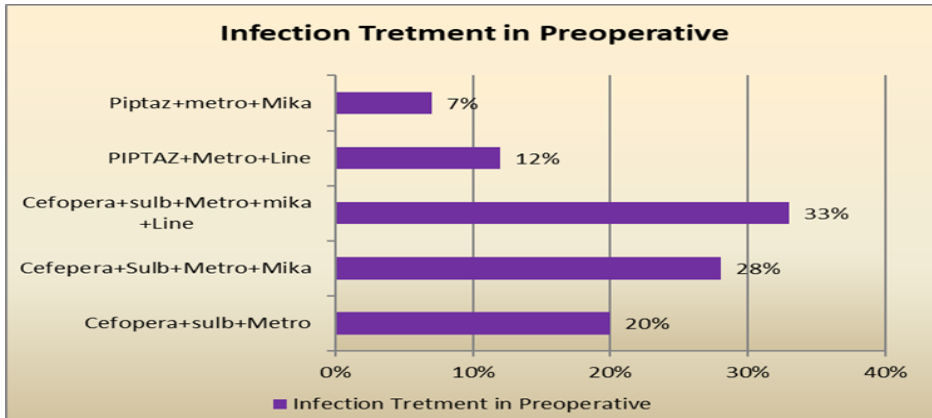


CHART-9: showing % of prophylaxis and pre-surgical treatment

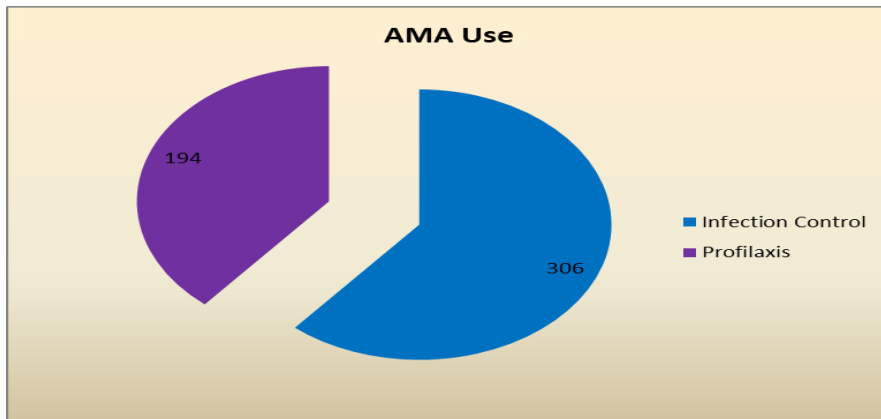


CHART-10 : classes of AMAs used and their combinations in post-surgical wards

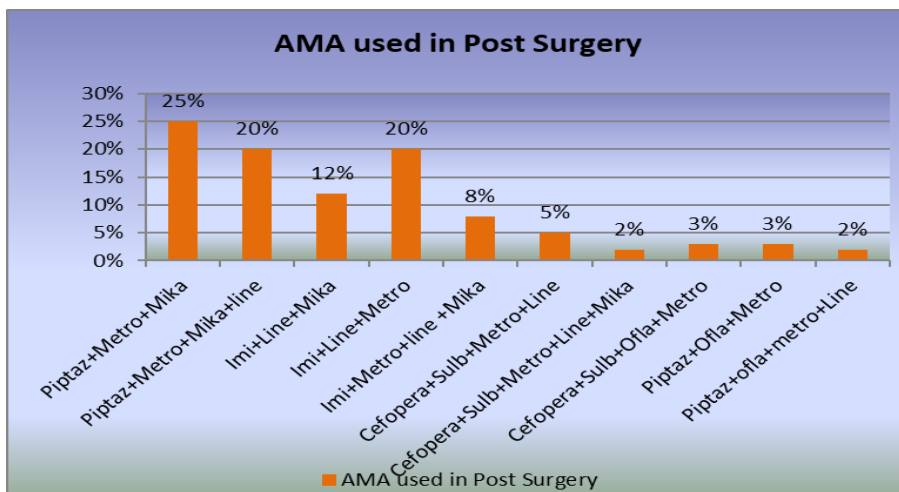


Chart-10 Pie diagram showing no. of AMAs combinations

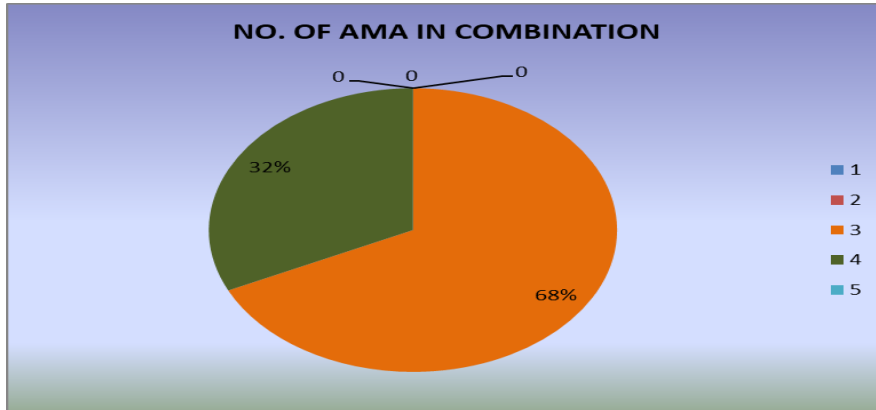


CHART-11 Commonly used AMAs-in pre-surgical ward—both for prophylaxis and pre-operative treatment

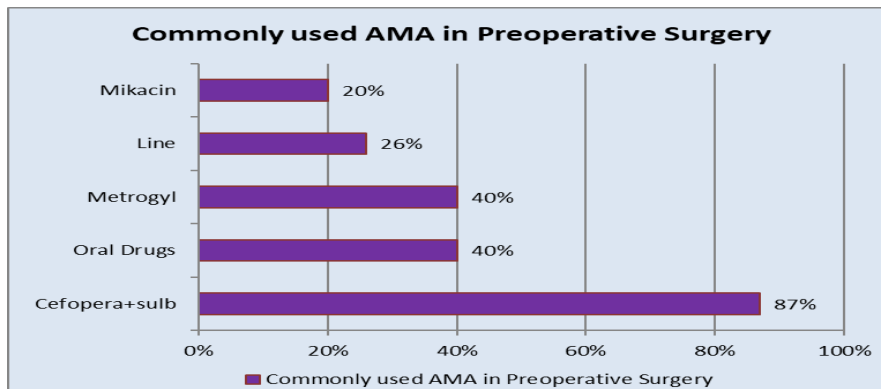


CHART-12 commonly used individual AMA class in post surgical ward

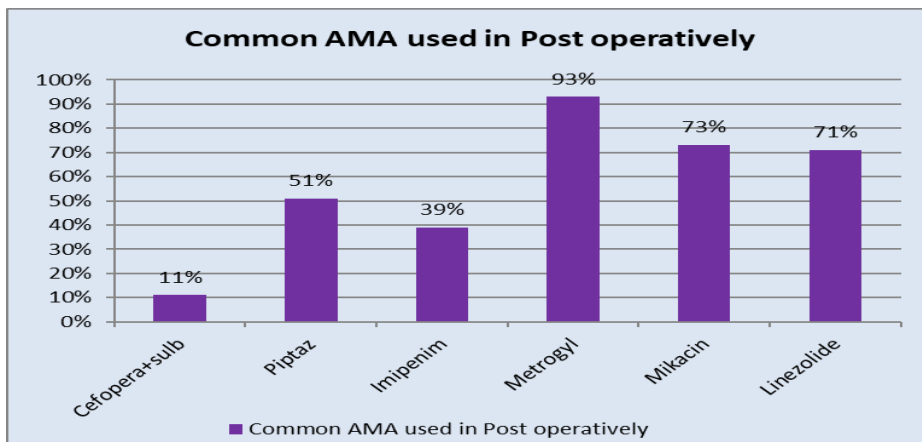


CHART-13 Summary of All deppartmentsfocusing prescription type and mode of prescription

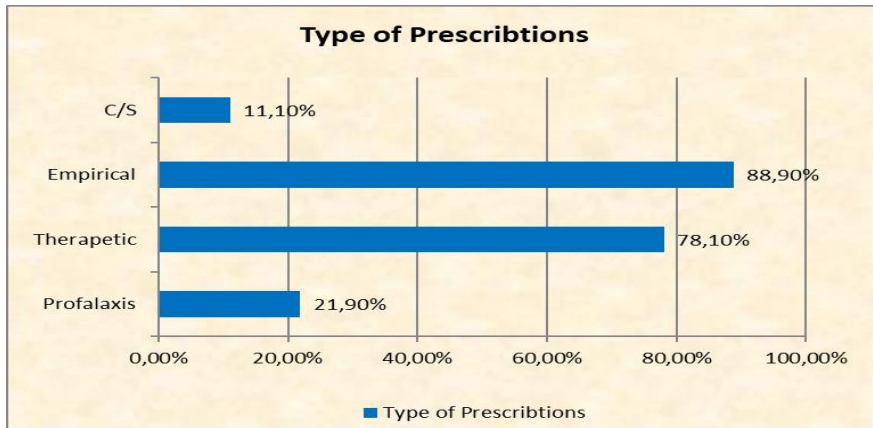


CHART-14: mode of treatment—empirically AND C/S

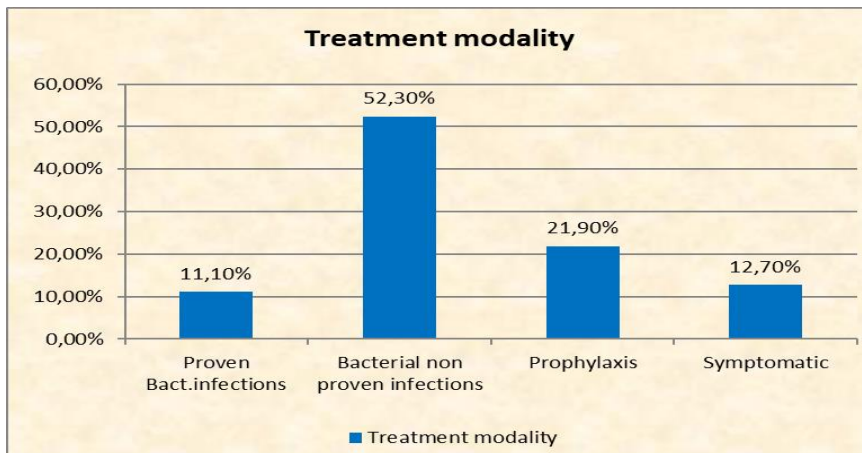


CHART-15: commonly used AMA class now-a -days

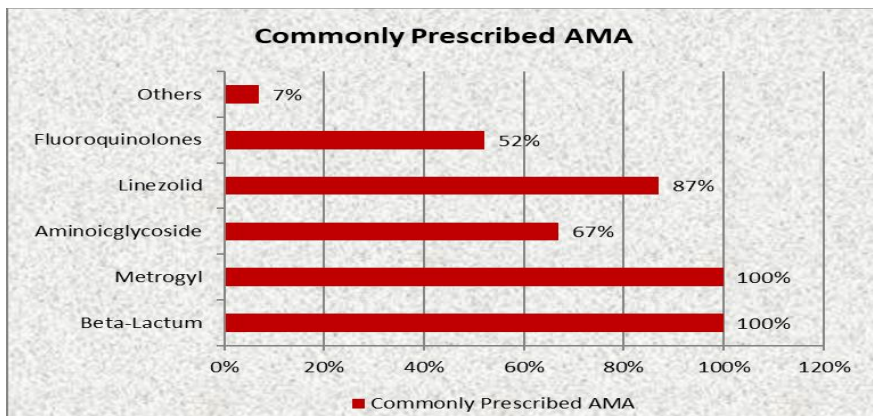


CHART-16 commonest AMA used-beta-lactams and frequency of individual beta-lactam use in the study population

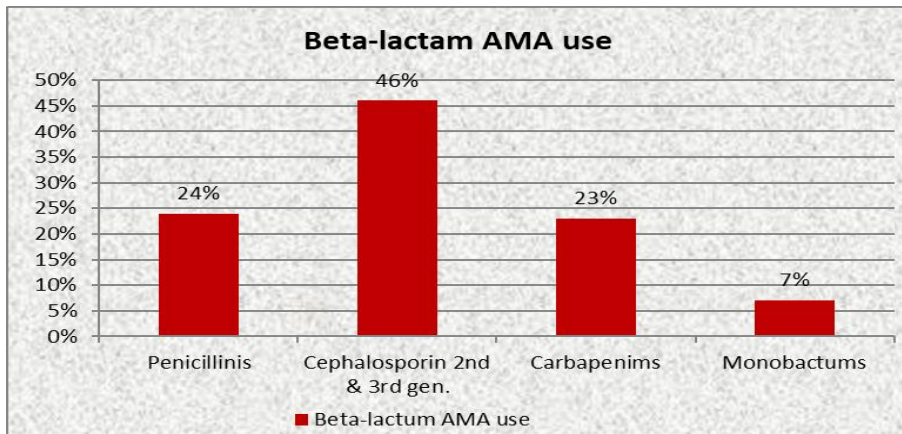


CHART-17 AMAs prescribed in brand name or generic name and %

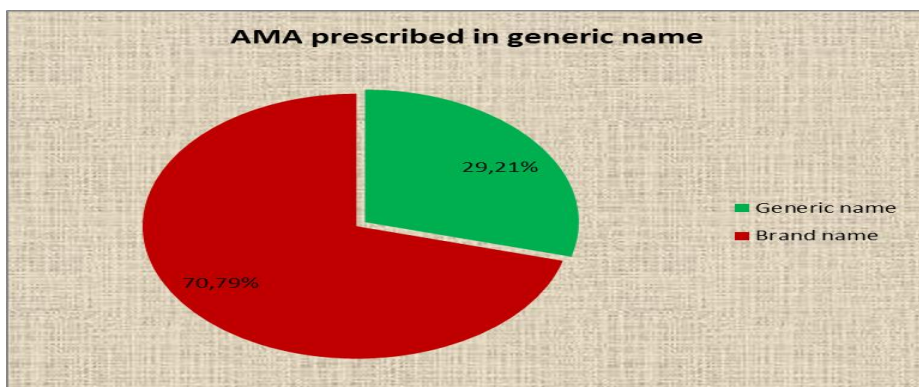


CHART :18 adverse reaction to AMAs and their %

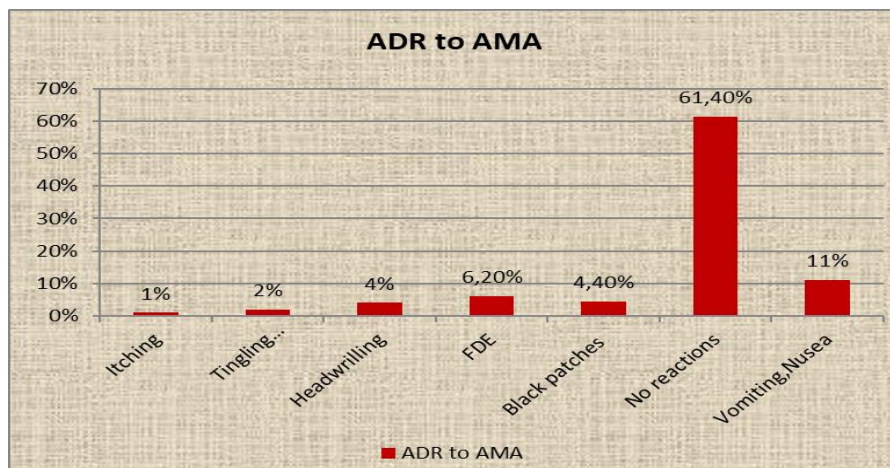


CHART-19: NO. OF AMA in combinations

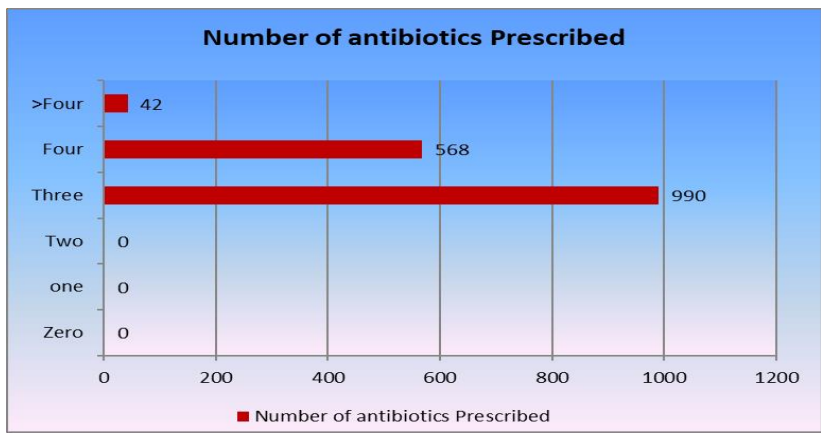


CHART-20 type of treatment—empirical/C/S

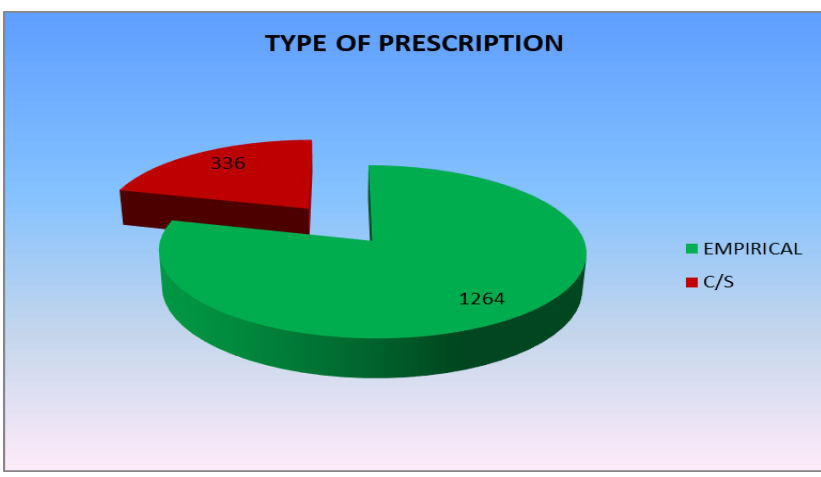


CHART-21: showing different types of treatment and outcome along with death

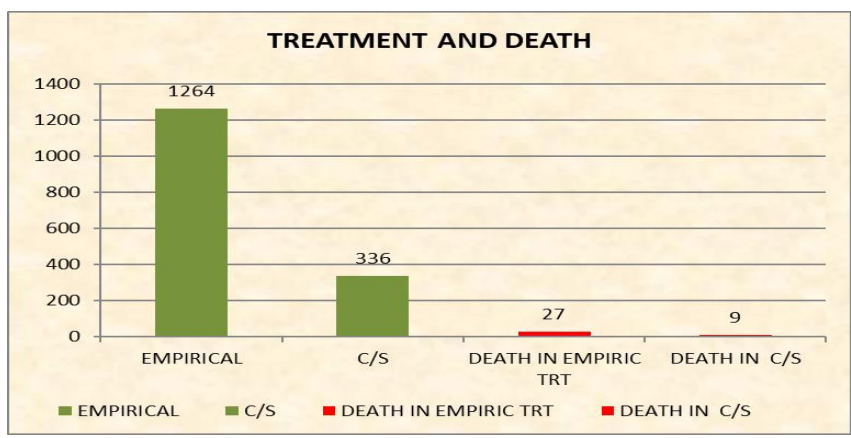


CHART-22 pie diagram showing common organism isolated, responsible for infection at different places-community and noso-comial

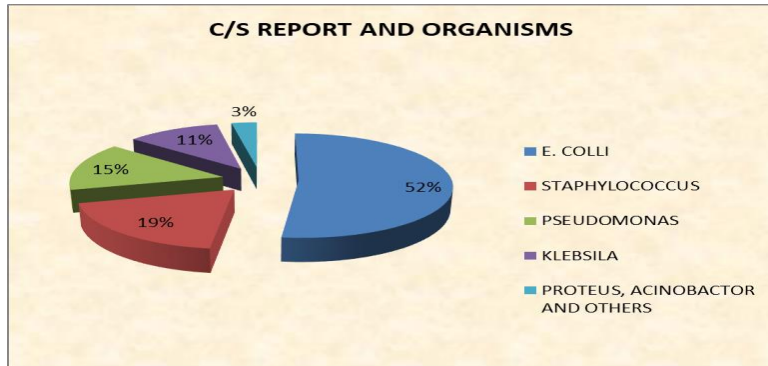


CHART-23: Different staphylococcal MDR isolates and their %

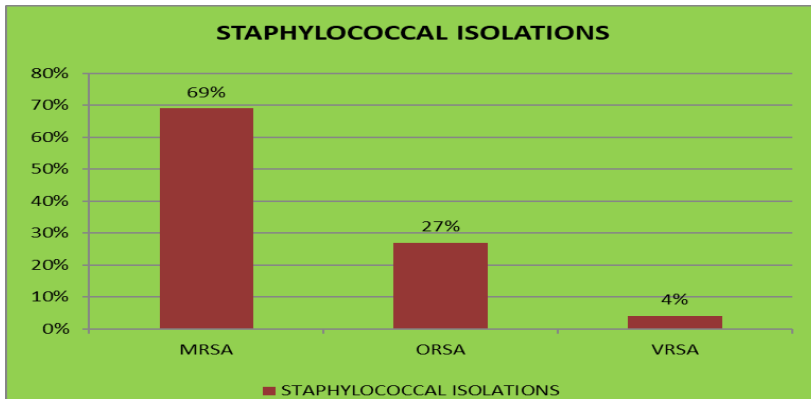


Chart-24: Prescriptions in brand or generic name and their %

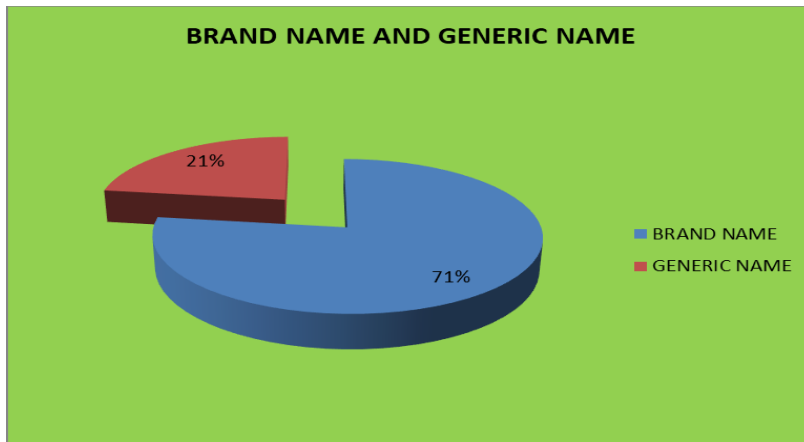


Chart-25: Showing handwriting legibility of prescriptions

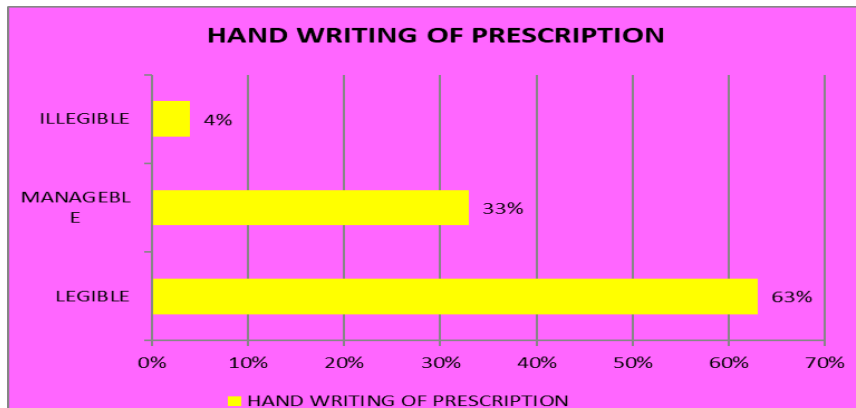
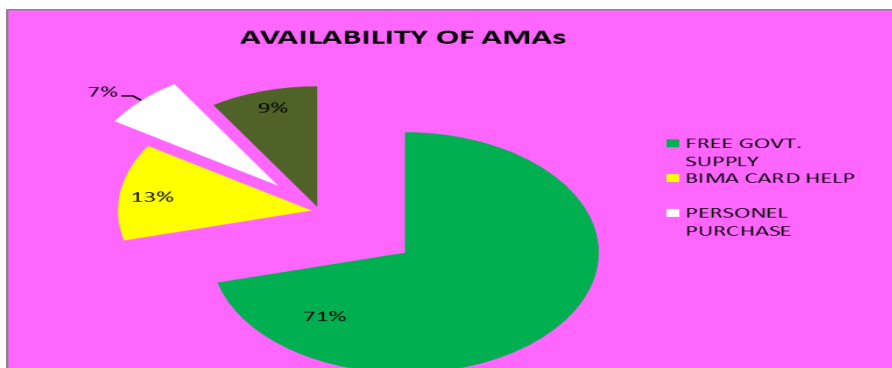
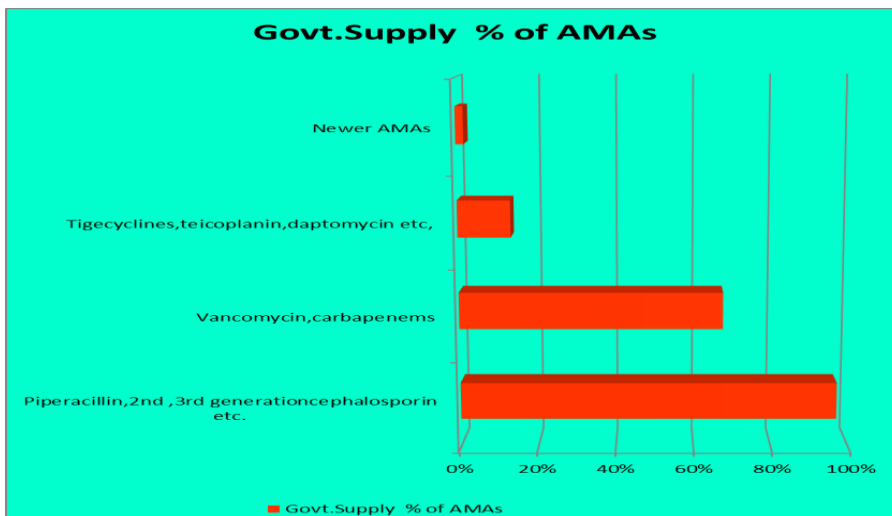


CHART-26: AMAs availability—GOVT, supply or arrangement or self purchase



CHART—27: types of AMAs and frequency of AMAs supply by GOVT. store and % of timings of short supply.



Discussion

Study Data

Total duration of this study is 3years and total patients covered as follows-

1. Treatment of infections at Post surgery ward 500
2. Pre-operative treatment—Surgery-500
3. Prophylaxis---500 (IV drug-70%, oral-30%).(C-41,28)

Out of 500 patients included in this study—60%--Male and 40% Female
Age—Maximum patients within > 18 yrs. and < 65 yrs.—80%-85%(T-2/C-2,15,23,35)

Types of AMAS used

The mostly used AMA—Beta- lactam, along with linezolid and metrogyl. Then Amino glycosides—Mostly Mikacin, Followed by Fluor quinolones

Number of AMAs used

Average no. of AMA per prescriptions—MAXM—3drugs—61-87%, 4 drugs—37.68% , and 5 drugs--0.45%(< ½ %)(C-45)

Observed philosophy of AMAs prescriptions and empiricaltherapy

To start with AMAs prescribed empirically in 100% patients, at no response or decreased response, C/S is done in—21% of cases, and AMAs changed later on as per C/S report. Aim of empirical therapy is in a way that—Early intervention will improve outcome.

Route of Amas used

ICU—IV—100%, Post-surgical—IV—92 %
In pre-operative—IV—100 %
In prophylaxis--- IV—70%, ORAL---30 %

Supply source---- Govt. free supply—83.45 %

Death in the study and result

This all deaths may not be due to AMAs failure, due to other co morbid condition, as in head injury, heart failure, myxedema etc. Compelling physicians to pen Broad spectrum AMAs or AMAs combinations. CMDT guide line supporting this. In maximum cases isolated organisms- E.colli= 52%, Staphylococcal- 19%, Pseudomonas-15%, Klebsilla-12%, Acinobactor and others—2%(C—57)
Staphylococcal--- MRSA—69%, ORSA—24%, VRSA—7%(C—58)
These organisms are susceptible to--- piperacillins, Mikacin, Carbapenims, some 3rd and 4th generation cephalosporin's, such as cefoperazone, ceftazidime, cefipime etc. and many fluroquinolones. , Vancimycin, Clarithromycin, Azithromycin.

Resistant to TC, Ampicillin, Chloramphenicol, cotrim, Erythromycin. Most common organism E.Coli--- Resistant to Ciprofloxacin, Ofloxacin, Cefoperazone and Ceftriaxone, Erythromycin, Gentamicin.

- i.To prevent post-partum infections, after normal delivery.
- ii.To prevent secondary bacterial infections after viral infections,
- iii.To prevent respiratory infections in unconscious patients or those who are on ventilators.

AMAs PROPHYLAXIS OF SSIs—SURGICAL SITE INFECTIONS—

AMAs used for prophylaxis are often inappropriately chosen and administered. 30%--40% of AMAs used in hospitals are for prophylaxis and more than 80% are given inappropriately > 48 h duration.

Conclusion

To prevent antimicrobial resistance, rationale use of antimicrobials is a must. The concept of antimicrobial for every patient should be eradicated. Antimicrobial policy should be developed and it must be ensured that it is implemented. Antimicrobial policy should be developed for every unit, ward, including ICU, operation theatre and regular monitoring should be done to ensure that antimicrobial policy is strictly implemented. Emphasis should be made on the use of drugs from the essential medicines list, and such list should be readily available in the ICU. Rotation therapy of antimicrobials should be followed to deal with the problem of resistance, restricting the drug formulary can also help in reducing antimicrobial resistance. Empirical therapy should be used only in an emergency and should be guided by the antimicrobial policy of the hospital, common causative organisms of nosocomial infection and local resistance pattern. These steps will ensure rational prescribing of antimicrobial agents and also decrease the risk of development of resistance to antimicrobial agents. The hospital staff should regularly be made aware of recent updates, changing patterns of resistance, and availability of new antimicrobials. The presence of a clinical pharmacologist in every ICU setup will ensure rational use of antimicrobials in a cost effective manner. The antimicrobial stewardship program is a must for every hospital and it should seek to achieve optimal clinical outcomes related to antimicrobial use, minimize toxicity and other adverse events, reduce the costs of health care for infections, and limit the selection for antimicrobial resistant strains.

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