

Research Article

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## A prospective study on antibiotic utilization in surgery and pediatric department, case study Baptist hospital, Bangalore, Karnataka

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### Keywords

Antibiotics,  
Culture sensitivity,  
Hospital policy.

### Abstract

**Objective:** To assess adherence to a hospital guideline policy of antibiotic therapy and to explore reasons for the non-adherence. **Methods:** Rationality of antibiotic prescription will be assessed by prescribing indicators like total number of drugs prescribed; the average number of drugs per prescription, the percentage of antibiotic prescribed, the number of antibiotic used as monotherapy and in combination will be recorded. The antibiotic prescribed will be assessed whether it is according to hospital antibiotic policy and in the case of violation the reason for it will be noted down. The incidence and cause of the nosocomial infection will be noted down. Apart from these antibiotic categories, the cost of antibiotic therapy from medical bills and the cost of the antibiotics will be calculated. **Results:** out of 200 patients 60.5% were male and 39.5% were females in surgery department 12.5% male and 9.5% females are in the age group 31-40 years, which was highest and in geriatric category 2% males and 2.5% females were in the age group of 81-90. Various classes of antibiotics like penicillin's, macrolides, cephalosporin's and fluoroquinolones were prescribed. Of which 13% males, 7% females were prescribed by penicillin's which were highest among monotherapy. Among combination therapy, 14% of males were prescribed and 7% females with penicillin which were highest. There were various combination drugs prescribed which are specific to the disease out of which ampicillin+gentamicin+metronidazole (5%) and ampicillin+ gentamicin+ cefotaxime+ amikacin (5%). **Conclusion:** The concluded the adherence to hospital policy in prescribing antibiotics was largely seen. Inappropriate use of antibiotics is detected due to lack of culture sensitivity test

### Introduction

Antibiotics are among the most frequently prescribed drugs worldwide. According to results of studies carried out in European countries and the United States, 23-38% of in-patients are given some kind of systemic antibiotic treatment. Antibiotics take the lead among most commonly used drugs in Turkey and account for 20% of the drug market. Antibiotics are the key drugs for treatment of infections and are among the most

commonly prescribed drugs in neonatal intensive care unit (NICU). Worldwide population consists of about 28% children and infants who are most susceptible to infective diseases due to under developed immune system. Several studies have reported that 50%-85% of children receive antibiotics prescribed by physicians. In addition, neonates are among the most vulnerable population groups to contract infections and are also

prone to harmful effects of drugs due to differences in pharmacodynamics and pharmacokinetic characteristics. The use of antimicrobial agents, especially antibiotics has become a routine practice for the treatment of neonatal illnesses. Antibiotic guidelines are standard set of guidelines for the treatment of infectious diseases based on local culture sensitivity data. (GülRuhsar YILMAZ G R et.al 2009). These guidelines help the physician to prescribe the antibiotics rationally to pediatric patients when definitely indicated (WHO model formulary for children, 2010). In spite of these, neonates are at high risk for opportunistic or nosocomial infections due to prolonged hospitalization and immunosuppressed condition. An overall rise in health care costs, lack of uniformity in drug prescribing and the emergence of antibiotic resistance, are issues of monitoring and control of antibiotic use is of growing concern.

The main challenges in prescription of antibiotics are to achieve a rational choice and appropriate use of antibiotics and to recognize their potential problems. Optimal and judicious selection of antimicrobial agents for the therapy of infectious diseases requires clinical judgment and detailed knowledge of pharmacological and microbiological factors. Unfortunately, the decision to use antibiotics frequently is made lightly, without regard to the potential infecting microorganism or to the pharmacological features of the drug (Rajendra B et.al 2015).

The aims of this study were to determine the rate of antibiotic usage in hospitalized patients, the reasons for antibiotic therapy, irrational uses, and the rates of irrational use in patients hospitalized. The present study is conducted on patients of surgery and paediatric for whom antibiotics is prescribed. In our study it is found that out of 200 patients 60.5% were male and 39.5% were females in surgery department 12.5% male and 9.5% females are in the age group 31-40 years which was highest and in geriatric category 2% males and 2.5% females were in the age group of 81-90

## **Materials and Methods**

A hospital based prospective study was conducted for a period of 6 months in in patient pediatric and surgery department at Bangalore Baptist hospital (BBH).

A total of 200 inpatients were included in this study. Prescriptions and treatment chart of inpatients were reviewed prospectively for prescribed patterns of

proton pump antibiotics. The hospital policy, therapeutic guidelines, Micromedex, Medscape and references books will be used as tools to review the prescription and case chart. The admission register is reviewed for prescription of any antibiotics. The case sheet, treatment chart, physician notes will be subjected for capturing any information related to the study.

All medically relevant information was noted in a predefined data collection form. Alternatively, these case charts were reviewed for prescription of antibiotics. The demographic data and the detailed history of patient regarding past, present, family, personal and drug history was taken. The other details like the present diagnosis, reason for the present admission, any investigations done to confirm the diagnosis were also noted.

Patients of both genders who were admitted into the inpatient wards in the Hospital, of all the age group were included in the study. The detailed information such as brand name, dosage, frequency, route, indication and any other relevant information will be retrieved and entered into the data collection form. The patients who have renal impairment, liver impairment and geriatric patients also taken.

Also found drug interactions of antibiotics and drug selection, dosage forms, route, frequency, indication of antibiotics was also studied.

Rationality of antibiotic prescription were assessed by prescribing indicators like total number of drug prescribed; average number of drug per prescription, percentage of antibiotic prescribed, number of antibiotic used as monotherapy and in combination were recorded. The antibiotic prescriptions were assessed whether it is according to hospital antibiotic policy and in case of violation the reason for it will be noted down. The incidence and cause for the nosocomial infection were noted down. Apart from these antibiotic categories, cost of antibiotic therapy from medical bills and the cost for the antibiotics will be calculated.

## **Results and Discussion**

In our study population out of 200 patients 121 were male and 79 were female and in paediatric population 15% were male and 1 2.5%. In surgery department highest number i.e 12.5% male and 9.5% females are in the age group 31-40 years. 2% males and 2.5% females were in the age group of 81-90.

In our study 5% male and 2% females were suffering from GIT ailments, 6% males and % females from appendicitis, 2.5% male and 6% females from pancreas related problems, 16% male 5.5% females had pulmonary related problems, 0.5% males and 2% females had CNS related problems, 3% males and 4% females had CVS related problems, 0.5% female had ENT related problem, 2% males and 0.5% females had bone related problems, 13% male and 3% females had liver related problems, 1% male and 4% females had genitourinary problems, 2% male and 1.5% females had fever, 4.5% male and 2.5% females were suffering from dengue.

In our study various class of antibiotics like penicillin's, macrolides, cephalosporin's and fluoroquinolones were prescribed. Out of which 13% males, 7% females were prescribed with penicillin's which were highest among monotherapy. Among combination therapy 14% of males were prescribed and 7 % females with penicillin are which were highest. There were various combination drugs prescribed which are specific to the disease out of which ampicillin+gentamicin+metronidazole (5%) and ampicillin+gentamicin+cefotaxime+amikacin(5%) (Table 1).

**Table 1: Study Patients Based On Number of Antibiotics Prescribed**

Class of antibiotics	monotherapy				Combination therapy			
	Number of male prescribed	(%)	Number of female prescribed	(%)	Number of male prescribed	(%)	Number of female prescribed	(%)
penicillin	26	(13)	14	(7)	23	(11.5)	14	(7)
macrolides	9	(4.5)	5	(2.5)	5	(2.5)	3	(1.5)
Cephalosporin's	9	(4.5)	9	(4.5)	16	(8)	7	(4.5)
fluoroquinolones	8	(4)	4	(2)	19	(8)	12	(6)
nitroimidazoles					28	(14)	11	(5.5)
lincosamide					4	(2)	1	(0.5)
Akt kit					5	(2.5)		

The antibiotics prescription in our study population is compared with hospital policy and international hospital policy for each disease in which .23.3% males, 13% females followed first line hospital policy which is highest among the reasons for following the hospital policy. Prescriptions of patients which did not follow hospital policy is 5% male 5% female. In our study most of the antibiotic prescription was according to hospital policy.

In our study it was seen that the antibiotic prescribing is not done after obtaining the culture sensitivity test only 13.5% of our study population had their culture sensitivity test done the prescribing from culture sensitivity has to be increased as it reduces the antibiotic resistance.in two patients where culture sensitivity test was conducted the hospital policy was not followed.

Pharmacoeconomics is very much important as the cost affecting the patients is known and also it encourages generic prescription in order to reduce the

cost burden. In our study the cost was assessed for various antibiotic prescription where penicillin costed – INR/ day, macrolides costed 200-400 INR/day, cephalosporin's costed 200-400 INR/day, aminoglycosides costed 400-500 INR/day, nitroimidazoles costed 100-200INR/day, lincosamines costed 300-400INR/day least costly is antitubercular medication as it is available by government in affordable price.

Various class of drugs are prescribed in our study population based on the patient condition and comorbidities out of which 49.5% were antigestric drugs, 5% were laxatives, 17% were antidiabetic, 29% were vitamins, 28.5% were antiemetic, 12.5% were antipyretics, 9% were antidiarrheal, 0.5% were antifungal, 26.5% were analgesic, 7% were antiepileptic, 6.5% were anticoagulant, 6% were diuretic, 6% were antihypertensive, 1.5% were antifungals,1.5% were antihistamines, 4% were hypolipidemic, 2% were nasal preparation, 1% were liver protectants, 3% were probiotics, 3.5% were

prokinetics, 2% were hormonal supplements, 2% were steroids, 2% were antianxiety medicines, 2.5% were antimalarial, 2.5% were skin protectants, 1% ear preparation, 2.5% thyroid drugs (Table 4). In a study by Feleke M et al. on prescribing pattern of antibiotics at east euthopia it was found that other classes of drugs prescribed along with the antibiotics were also analysed.

In our study population a total of 92 % prescription was seen to be having rational prescribing of antibiotic and 8% had irrational prescribing due to frequency incorrect, wrong drug prescribed which is not indicated for the disease and in some hospital policy was not followed. In a similar study by naushhen S et al. on rational use of antibiotics it was found that Therapeutic antibiotic use was rationalized, reducing the use of therapeutic antibiotics from 97% (n=160/165) in January 2010 to 8% (n=10/125) in December 2010. Surgical site infection rates were less than 5%. Cost of antibiotics per patient decreased by 90%. Decrease in the length of stay and workload on nursing staff was also observed<sup>2</sup>. In a study by Vandhana AB et al on prescribing pattern of antimicrobial agents in central part of India it was found that in 30% patient the antimicrobial therapy considered rational, in 59% patient therapy considered irrational while in 11% patient it is questionable<sup>5</sup>.

## Conclusion

The concluded the adherence to hospital policy in prescribing antibiotics was largely seen.

In appropriate use of antibiotics is detected due to lack of culture sensitivity test which has to make mandatory in the hospital before antibiotic prescription.

Less cost effective antibiotic treatment should be prescribed. Polypharmacy was seen in a large extent

were patients were put on 4-5 antibiotics, which has to be avoided by using broad spectrum antibiotics and fixed dose antibiotics suitably. The drug interactions with antibiotics should be also minimized.

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