**ABSTRACT**

**Introduction:** Antimicrobials are among the most commonly prescribed drugs. Irrational prescribing leads to antimicrobial resistance and treatment failure. The purpose of drug use evaluation is to ensure that drugs are used appropriately, safely, and effectively. Use of antimicrobials in different wards is likely to be different due to difference in causative organism. This study aims to evaluate antimicrobials prescription pattern in indoor patients of departments of general medicine and general surgery of a tertiary care teaching hospital. **Material and method:** This is a cross sectional observational unicentric study. 100 prescriptions from departments of general medicine and general surgery were collected from the record section of College of Medicine and JNM Hospital, Kalyani, Nadia. Prescriptions were selected by simple random sampling. After selection of prescriptions of all 3 departments, following data were entered from each bed head tickets- number of antimicrobials prescribed, their name and class, indication of use, duration of use, route of administration and whether generic name was used. Patients’ identity remained confidential. **Results:** Beta lactam antibiotic was the most commonly prescribed group in general surgery.
whereas in medicine ward, beta lactam with beta lactamase inhibitor (BLBLI) group was most commonly used. Among BLBLI group, Piperacillin-tazobactam was mostly prescribed. Overall, ceftriaxone was the most commonly prescribed antimicrobial agent. **Conclusions:** Use of antimicrobials varies in different wards due to different causative organisms. Intravenous route was used in much higher number of patients than oral route. Generic name use was not satisfactory.

**Key words**- antimicrobials, rational use, prescription, medicine, surgery, indoor patient

**INTRODUCTION**

The use of antimicrobial agents has become a routine practice for the treatment of many illnesses, and antimicrobials are among the most commonly prescribed drugs in all indoor patients. The rising incidence of bacterial resistance to commonly used antimicrobials, particularly the emergence of multi-drug resistant organisms has made it mandatory that antimicrobials must be used judiciously.¹

Antimicrobial therapy demands an initial clinical evaluation of the nature and extent of the infective process and knowledge of the likely causative pathogen(s). This assessment should be supported, whenever practical, by laboratory investigation and its susceptibility to antimicrobial agents appropriate for the treatment of the infection. The overuse and inappropriate use of antimicrobials has led to antimicrobial resistance.² During the last decade, their resistance is on the rise. This is mainly due to the abuse of broad-spectrum antibiotics in first line treatment, or erroneous use (e.g. treatment of viral respiratory tract infection), use of multiple courses (e.g. cystic fibrosis patients) or prolonged duration of antimicrobial treatment.³

One of the major contributing factors for emergence of resistance and treatment failure due to irrational use of antimicrobials is their irrational prescribing with respect to dose, frequency, and duration and not considering compatibility and drug interaction effect of co-administered drug. Other contributing factors are related to pharmacist, the patient, and the disease. In addition to emergence of resistance, such factors may led to infections that are worse than the originally diagnosed one which increase duration of hospital stay and cost of treatment.⁴ Antibiotics are among the most commonly prescribed drugs in hospitals and in developed countries around 30% of the hospitalized patients are treated with these drugs.⁵ In a study done at Bishoflu Hospital, Ethiopia⁶ by Feleke M, Yenet W, Lenjisa JL showed that
Ceftriaxone was the most frequently prescribed antibiotic and gentamicin the second most commonly prescribed antibiotic. Similar study by Rajeswari R et al revealed that cefuroxime as the most commonly prescribed antibiotics followed by Ceftriaxone/Sulbactam combination and Ceftriaxone alone ranked 5th.¹

Elfaki A, in his Assessment of Antibiotics prescription in Hospitalized Patients at Elobeid Hospital, Sudan⁷ showed that the mean number of antibiotic ±SD prescribed for each patient was 1.6 ± 0.95 drugs. 148 (37.2%) of the drugs were prescribed in generic name. In 52 (13%) drug prescriptions, the drug strength was not written. In the majority of the records (92.9%), the duration of drug therapy was not stated. Parenteral route of drug administration was prescribed for 50.8% of the antibiotics. The most commonly prescribed antibiotics were ceftriaxone, amoxicillin-clavulanic acid combination, benzyl penicillin (penicillin G), ciprofloxacin, cefuroxime, and metronidazole.

The purpose of drug use evaluation is thus to ensure that drugs are used appropriately, safely, and effectively to improve patient’s health status. Additionally, continual improvement in appropriate and effective use of drugs like antimicrobials has potential to lower the overall cost of care. Use of antimicrobials in different wards is likely to be different due to difference in causative organism. Considering it, this study aims to evaluate antimicrobial prescription pattern in indoor patients of department of general medicine and department of general surgery of a tertiary care teaching hospital in West Bengal and whether there is any significant difference in use of antimicrobials between these two departments.

MATERIALS AND METHODS

Objectives of study

Primary objective- to assess pattern of prescription of different antimicrobials in indoor patients of departments of general medicine and general surgery - class of drugs, their indication, their route of administration, duration of use, whether generic names were used.

Secondary objectives-1. to find out difference in patterns of use of antimicrobials between these two departments. 2. whether irrational prescription of antimicrobials were done or irrational combinations were used.

Methodology- This is a cross sectional observational unicentric study. Study began after getting clearance from Institutional Ethics Committee. The study were performed by
collecting bed head tickets of patients of departments of general medicine, general surgery, pediatric medicine, in whom one or more antimicrobials was prescribed. 100 such prescriptions from departments of general medicine and general surgery were collected from record section of College of Medicine and JNM Hospital, Kalyani, Nadia. Among 100 patients in each of departments of general medicine and general surgery, bed head tickets of 50 male and 50 female patients were taken. Prescriptions were selected by simple random sampling.

After selection of prescriptions of two departments, following data were entered from each bed head tickets- number of antimicrobials prescribed, their name and class (beta lactam, beta lactam with beta lactamase inhibitors, aminoglycoside, fluoroquinololone, macrolide, carbapenems, anti/protozoal, antifungals, others like cotrimoxazole, linezolid), their indication of use, duration of use, route of administration (IV/IM/oral) and whether generic name was used for the antimicrobials. Patients’ identity remained confidential. Pattern of antimicrobials used was calculated in percentage. Irrational combination of antimicrobials, if any, were noted. Difference of use of antimicrobials in 3 departments were calculated then. Indications for which no antimicrobial is necessary were noted.

RESULTS
Following results were obtained from the study.
Average number of antimicrobials prescribed in medicine ward was 1.41, whereas for surgery ward, it was 1.93..

For medicine ward, use of different antimicrobials is as follows-
Beta lactams -30 patients (all ceftriaxone)
Beta lactam with beta lactamase inhibitors- 72 (amoxicillin clavulanate- 11, cefepime tazobactam -1, cefoperazone sulbactam- 3, ceftazidime tazobactam- 21, ceftriaxone tazobactam -6, piperacillin tazobactam- 30),
Carbapenems- 4 patients (all Meropenem)
Monobactam (Aztreonam)- 2 patients.
Fluoroquinolone- 12 patients (ciprofloxacin 3, levofloxacin 4, ofloaxacin 5),
Macrolide- 7 patients (all azithromycin)
Antiamoebic-11 patients ( metronidazole 9, ornidazole 2.)
Nitrofurantoin in 1 patient,
Clindamycin in 1 and Fluconazole in 1 patient.
For surgery ward, prescription pattern is-
Beta lactams in 73 patients, (amoxicillin 1, ampicillin 2, ceftriaxone 58, cefuroxime 9, cefpodoxime 3)
Beta lactam with beta lactamase inhibitors in 22 patients (amoxicillin clavulanate 4, cefoperazone sulbactam 4, piperacillin tazobactam 11, ceftriaxone sulbactam 1, cefuroxime clavulanate 1, cefotaxime tazobactam 1)
Fluoroquinolone in 29 patients (ciprofloxacin 27, levofloxacin 1, norfloxacin 1)
Aminoglycoside in 14 patients (all gentamicin),
Antiamoebic in 46 patients (all metronidazole)
Others- linezolid in 4, clindamycin in 5 patients.
In medicine ward, 66% patients were prescribed a single antimicrobials, whereas for surgery, only 33% patients were given single antimicrobial agent. 2 antimicrobials were used in 47% of patients of general surgery patients. Figure 3 describes percentage of patients receiving different number of antimicrobial agents.

![Figure 3: Distribution of number of antimicrobial used in different wards](image)

**DISCUSSION**

Intravenous route was used in the majority, more in general medicine ward than in general surgery. The probable reason may be that almost all patients were initially started with intravenous antimicrobials and following recovery they were switched to oral antimicrobials. As the duration of stay was not long, many patients were not given oral antimicrobials in ward, rather they were discharged with advice of taking oral antimicrobials for few days after discharge. Use of IV antimicrobials in presence of suitable oral agents should be minimized.
Generic name use while prescribing antimicrobials was not satisfactory. Medicine ward prescribed antimicrobials in generic name in 69.01% and surgery ward only in 55.44%. More prescription in generic name must be emphasized.

Use of antimicrobials in different ward showed prominent differences. Beta lactam antibiotic was the most commonly prescribed group in general surgery ward whereas in medicine ward, use of beta lactam antibiotic is superceded by beta lactam with beta lactamase inhibitor (BLBLI) group significantly (30 V 74). The overuse of the BLBLI group should be minimized to prevent emergence of resistance.

Among BLBLI group, Piperacillin tazobactam was mostly prescribed in general medicine and general surgery ward. No aminoglycoside was found to be prescribed in 100 patients of medicine ward and no macrolide was found to be prescribed in 100 patients of surgery ward. Metronidazole was used in surgery ward in significantly higher number of patient than in medicine ward, probably to cover anaerobic bacteria after abdominal surgery. Overall, ceftriaxone was the most commonly prescribed antimicrobial agent it was used in 88 patients out of 200.

In medicine ward, 9 patients out of 100 were given antimicrobials, where it was not very necessary like transient ischemic attack(2), hypoglycemia(2), hypertension(2), peptic ulcer(3).

CONCLUSION

In most of the patients, either one or two antimicrobials was prescribed. 3 or more drugs were attempted only in complicated cases. Use of antimicrobials vary in different wards due to different causative organisms. Duration of therapy was not long. Intravenous route was used in much higher number of patients than oral route. Though generic name was used for majority of antimicrobials, that percentage should be increased to minimize cost of therapy. Irrational use of antimicrobials was present in very low number of patients, though it should be stopped in all cases.

REFERENCES


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