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RESEARCH ARTICLE

ASSESSMENT AND COMPARISON OF ANTIMICROBIALS PRESCRIPTION IN INDOOR PATIENTS OF DEPARTMENTS OF GENERAL MEDICINE AND PEDIATRIC MEDICINE IN A TERTIARY CARE HOSPITAL IN EASTERN INDIA¹Abhishek Ghosh*, ²Saumya Sarkar, ¹Keshab Mukhopadhyay¹Demonstrator, Department of Pharmacology, College of Medicine & JNM Hospital, Kalyani, Nadia, West Bengal²Resident, Department of Pharmacology, R.G. Kar Medical College, Kolkata³Professor, Department of Pharmacology, College of Medicine & JNM Hospital, Kalyani, Nadia, West Bengal**ABSTRACT:**

Objective: 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 and age. This study aims to evaluate antimicrobials prescription pattern in indoor patients of departments of general medicine and pediatric medicine of a tertiary care teaching hospital in Eastern India.

Design: This is a cross sectional observational unicentric study. 200 prescriptions from departments of General Medicine and Pediatric Medicine 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 2 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 pediatric medicine ward, whereas in medicine ward, beta lactam with beta lactamase inhibitor (BLBLI) group was most commonly used. Among BLBLI group, Piperacillintazobactam 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, general medicine, pediatric medicine, indoor patients.

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 lead 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 this drugs.⁵ In a study done at Bishoflu Hospital, Ethiopia⁶ by Feleke M, Yenit W, Lenjisa JL showed that Ceftriaxone was the most frequently prescribed antibiotic and gentamicin the second most commonly prescribed antibiotic.

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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 Elubeid Hospital, Sudan⁷ showed that the mean number of antibiotic \pm 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 and different age of patients. Considering it, this study aims to evaluate antimicrobial prescription pattern in indoor patients of department of general medicine and department of pediatric medicine 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 pediatric medicine - 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 was a cross sectional observational unicentric study. Study began after getting clearance from Institutional Ethics Committee. The study was performed by collecting bed head tickets of patients of departments of general medicine and pediatric medicine, in whom one or more antimicrobials was prescribed. 200 such prescriptions from departments of general medicine and pediatric medicine were collected from record section of College of Medicine and JNM Hospital, Kalyani, Nadia. Among 200 patients in each of departments of general medicine and pediatric medicine, bed head tickets of 100 male and 100 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, fluoroquinolone, macrolide, carbapenems, antiprotozoal, 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. Differences of use of antimicrobials in 2 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 in pediatric medicine, average number of antimicrobials prescribed was 1.67.

For medicine ward, use of different antimicrobials in 200 patients is as follows-

Beta lactams -60 patients (all ceftriaxone)

Beta lactam with beta lactamase inhibitors- 144 (amoxicillin clavulanate- 22, cefepime tazobactam -1, cefoperazone sulbactam- 7, ceftazidime tazobactam- 42, ceftriaxone tazobactam -11, piperacillin tazobactam- 61),

Carbapenems- 8 patients (all Meropenem)

Monobactam (Aztreonam)- 4 patients.

Fluoroquinolone- 25 patients (ciprofloxacin 7, levofloxacin 8, ofloxacin 10),

Macrolide- 13 patients (all azithromycin)

Antiamoebic-21 patients (metronidazole 17, ornidazole 4.)

Nitrofurantoin in 2 patients,

Clindamycin in 3 and Fluconazole in 2 patients.

For 200 pediatric patients, pattern of antimicrobials prescription is-

Beta lactam 108 (amoxicillin 1, cefixime 8, cefotaxime 51, ceftriaxone 44, cefpodoxime 4),

Beta lactam with beta lactamase inhibitors – 67 (amoxicillin clavulanate 52, piperacillin tazobactam 15),

Carbapenems 12 (all meropenem),

Aminoglycosides- 89 (all amikacin),

Macrolides- 6 (all azithromycin),

Antiamoebics- 17 (metronidazole 10, ornidazole 7),

Cotrimoxazole- 24,

Fluoroquinolones- 8 (ofloxacin 7, ciprofloxacin 1),

Linezolid- 3,

Albendazole-

1.

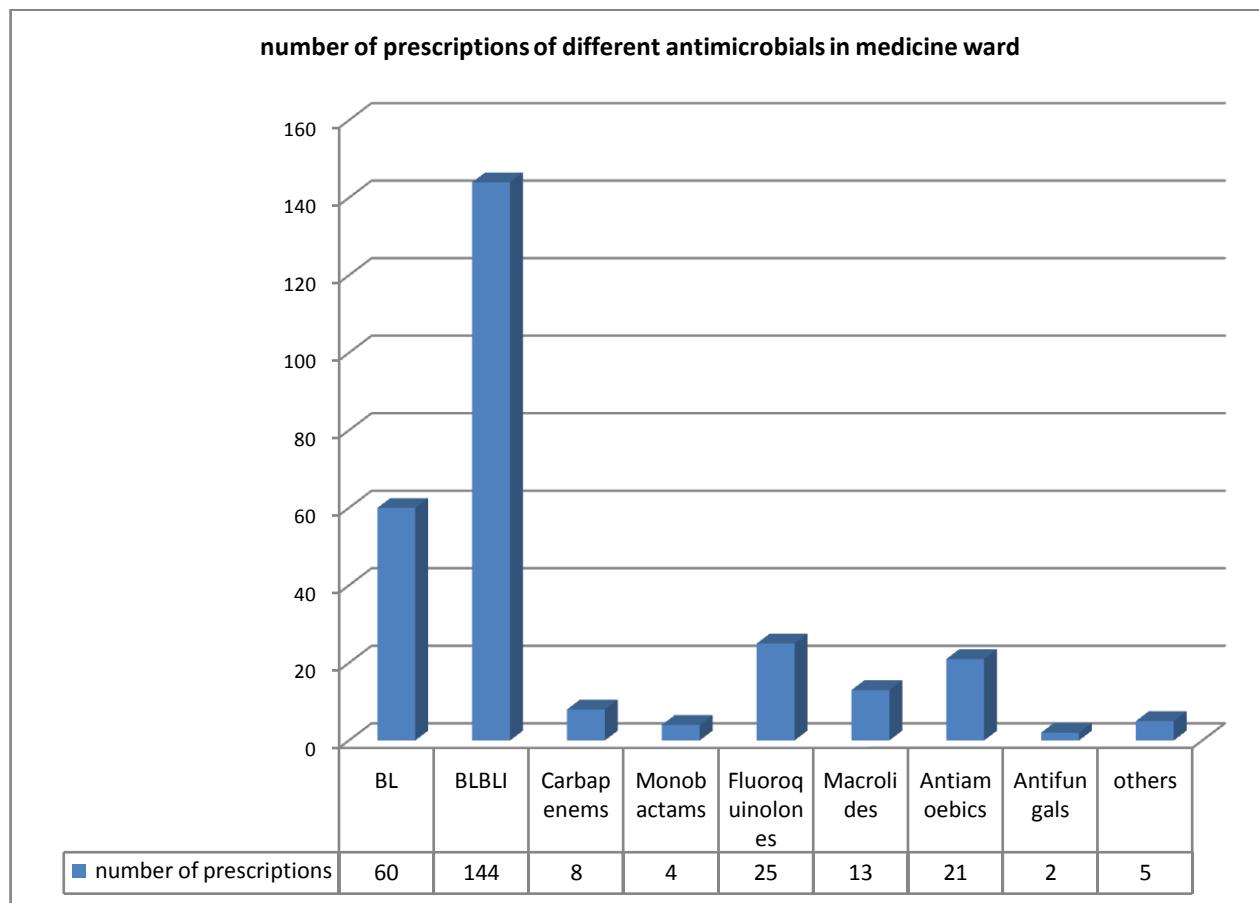


Figure 1: number of different antimicrobials prescribed in General medicine ward

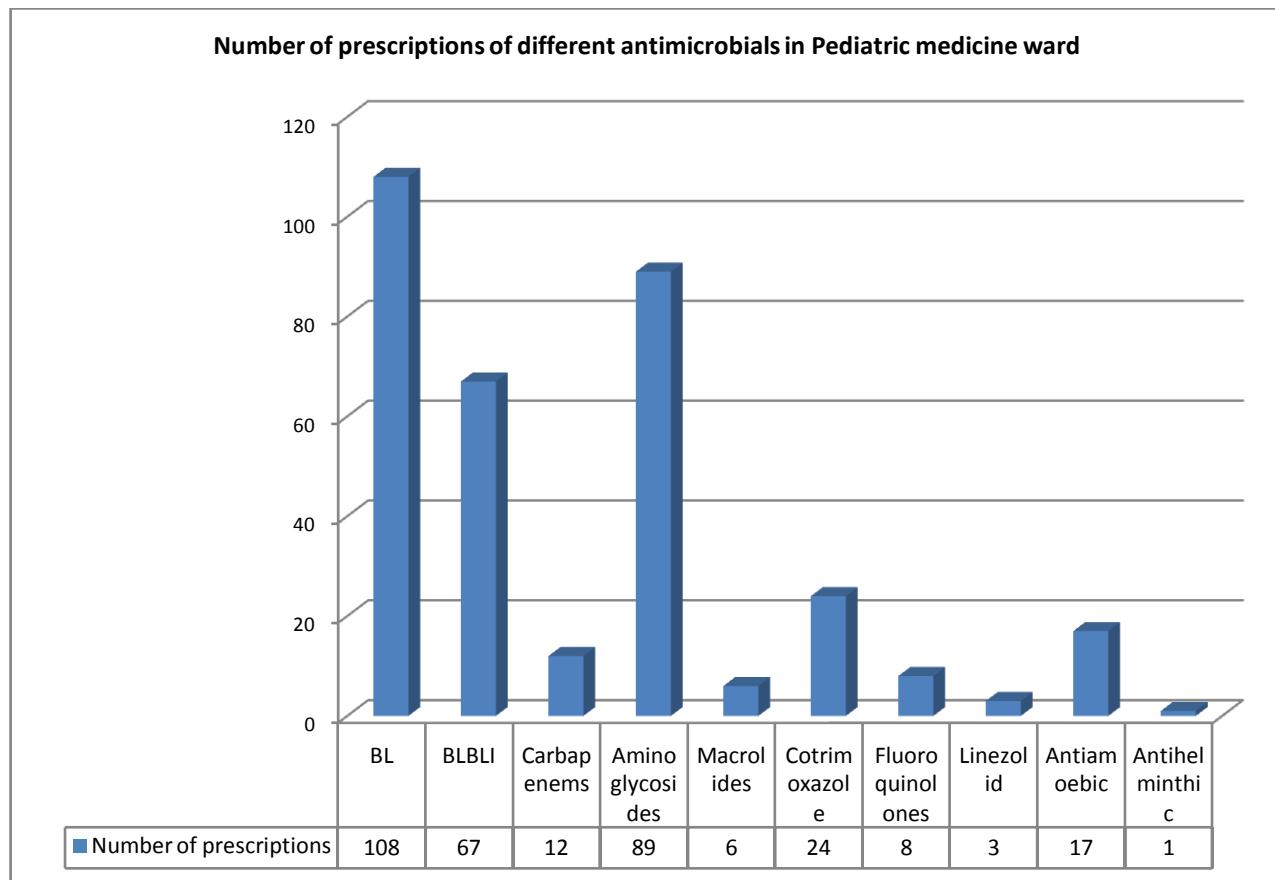


Figure 2: number of different antimicrobials prescribed in Pediatric medicine ward

In medicine ward, 66% patients were prescribed a single antimicrobials, whereas for pediatrics only 46.5% patients were given single antimicrobial agent. 2

antimicrobials were used in 43% of pediatric patients. Figure 3 shows distribution of number of antimicrobials used in patients of these two wards.

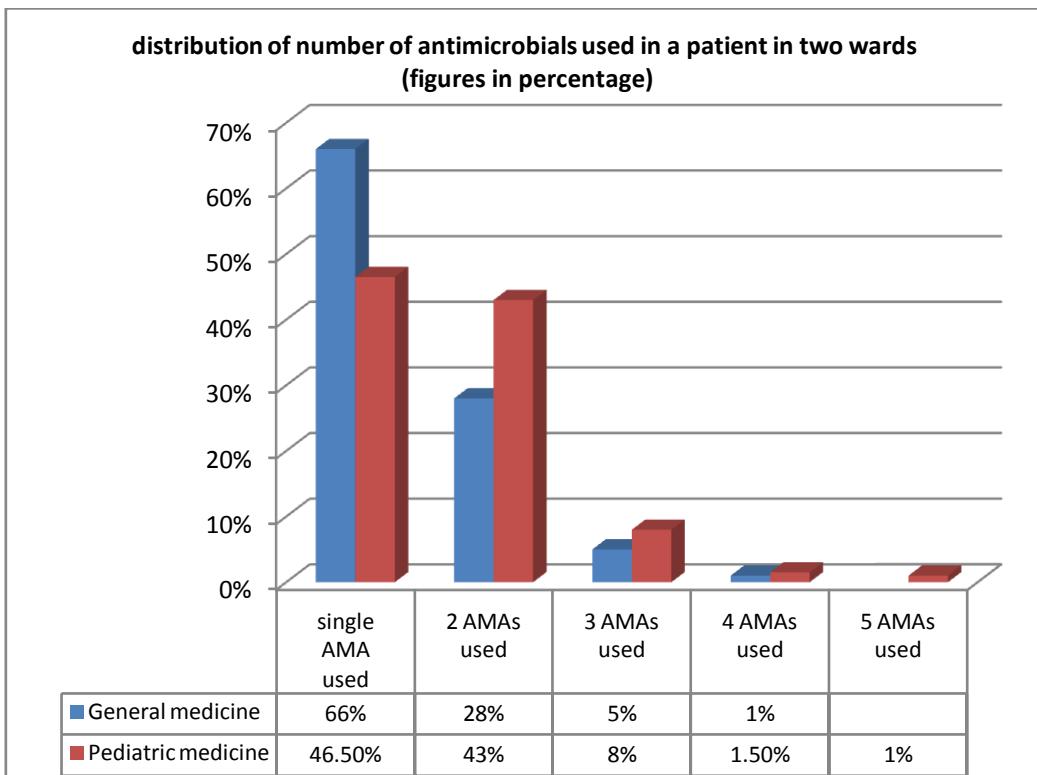


Figure 3: Distribution of number of antimicrobial used in patients of General Medicine and Pediatric medicine wards

In medicine ward, 91.55% antimicrobials were prescribed for intravenous administration; only 8.45% were for oral administration. In pediatrics ward, IV route were used for 69.25% antimicrobials administration.

In medicine ward, 69.01% antimicrobials were prescribed in their generic names, almost similar to that of pediatric ward, where 69.05% antimicrobials were prescribed in their generic names.

Average duration of antimicrobial use was 3.05 days in medicine ward and 4.71 days in pediatric ward.

In pediatric ward, dose of all drugs were written in prescription appropriately, but for 20 antimicrobials in medicine ward (14.08%), doses were not mentioned.

Commonest indications for antimicrobial use-

Medicine ward: cerebrovascular accident, followed by lower respiratory tract infection, acute gastroenteritis.

Pediatric medicine ward: acute gastroenteritis, lower respiratory tract infection, neonatal sepsis.

DISCUSSIONS

Intravenous route was used in the majority, more in general medicine ward (91.55%), than pediatric medicine ward. The probable reason may be that almost all patients were initially started with intravenous antibiotics and following recovery they were switched to oral antibiotics. As the duration of stay was not long, many patients were not given oral antibiotics in ward, rather

they were discharged with advice of taking oral antibiotics for few days after discharge. Use of IV antibiotics in presence of suitable oral antibiotics should be minimized.

Generic name use while prescribing antimicrobials was not satisfactory, 69.05% antimicrobials in pediatric medicine ward and 69.01% antimicrobials in general medicine ward. 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 pediatric medicine ward whereas in medicine ward, use of beta lactam antibiotic is superseded by beta lactam with beta lactamase inhibitor (BLBLI) group significantly (30 Vs 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 ward, but in pediatric medicine ward, amoxicillin clavulanate was mostly prescribed.

No aminoglycoside was found to be prescribed in 200 patients of medicine ward.

Aminoglycoside use was quite high in pediatric ward (received by 44.5% patient). Cotrimoxazole was only used in pediatric ward, in cases of acute gastroenteritis.

Overall, ceftriaxone was the most commonly prescribed antimicrobial agent it was used in 104 patients out of 400.

In medicine ward, 18 patients out of 200 were given antimicrobials, where it was not essential like transient ischemic attack(3), hypoglycemia(3), hypertension(5), peptic ulcer(7).

CONCLUSIONS

In most of the patients, either one or two antimicrobials were prescribed. 3 or more drugs were administered only in complicated cases.

Use of antimicrobials vary in different wards due to different causative organisms and different age groups.

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.

Use of carbapenems should be reserved for serious infections only.

Drug dosing must be mentioned clearly with proper duration of therapy.

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