

Antibiotics Prescribing Pattern among Outpatients in a Tertiary Health Care Center of Nepal

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ABSTRACT

Introduction

Antibiotics are most abundantly used drugs of major global concern for rapid ongoing emergence of resistant strains, increase overall cost of treatment and impact on national economy. Optimized use of antibiotic on the basis of proper diagnosis, prescriber's attention about the problem and antimicrobial stewardship programs may become a way to rationalize the use.

Methods

A descriptive cross-sectional study was done in patients visiting to various OPD of tertiary referral hospital. Prescriptions were randomly selected and Antibiotics utilization was assessed by WHO prescribing Indicator form. Prescribed drugs were checked for adherence to guidelines and essential medicine list.

Results

Among 731 sampled prescriptions, 384 (52.53%) were found with at least one antibiotic; 214 prescriptions (55.72%) were of female patients. Mean age was 37.71 years with SD 25.01. Highest numbers of patients (21.09%) belong to the 15-29 age group. Highest number of patients 158 (41.15%) treated with antibiotics were seen in patient attending Medicine department, 30 antibiotics were prescribed for 577 times. Amoxicillin-Clavulanate 70 (12.13%) was the most frequently prescribed followed by Azithromycin and Metronidazole with frequency of 39 (6.76%). Drug availability is 50.36%, in the facility and only 2.4 % of drugs were prescribed in generic.

Conclusions

More than half of the patients were prescribed with antibiotics and all antibiotics were prescribed empirically. Newer generation antibiotics with broad spectrum efficacy were used in remarkable frequency. This study provides evidence for antibiotic stewardship, drug use review and establishment of institutional guidelines.

Keywords: antibiotics; patients; prescriptions; stewardship.

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INTRODUCTION

Antibiotics are most abundantly used drugs in worldwide. Although, these are milestones in protecting large number of populations from infectious diseases, inappropriate use of antibiotics, overuse, lack of adherence to therapy, erroneous prescription writing are most common forms of irrational use of antibiotics which commonly exist in low and middle income or developing countries like in Nepal.^{1,2} This is a major global concern for rapid ongoing emergence of resistant strains of microorganism and its impact on national economy as it increases overall cost of treatment. A strong policy for the preparation and implementation of guidelines for antibiotics use are necessary.³ Optimized use of antibiotic on the basis of proper diagnosis and control of antimicrobial use by patient can be regarded as key strategy to control antimicrobial resistance by slowing emergence.⁴ Prescriber's attention about the problem and intention to prevent unnecessary use of antimicrobial agents (AMA) is crucial in selection of therapy.⁵ Lack of guideline for AMA use, traditional pattern of antimicrobial prescribing, overcrowd of patient in Hospital which put burden to the prescribers, patient denial of proper investigation procedure due to financial constraint.^{6,7} Antimicrobial stewardship programs in hospitals and Pharmacovigilance and clinical pharmacy services in hospital may become a way to rationalize the use of antimicrobial drugs in hospital.^{8,9} Aim of this study is to assess the antimicrobial prescribing pattern to patient attending outpatient clinic in tertiary referral governmental hospital. This will allow the healthcare provider and hospitals to take action for rational use of antibiotic, guideline preparation, and antimicrobial stewardship program.

METHODS

A descriptive cross sectional study was carried out in Outpatient departments (Medicine,

Dermatology, General surgery, Neurosurgery, Gynecology, Pediatrics, Orthopedics, and Neuropsychiatry) of Bharatpur Chitwan, Nepal between July 2021 and June 2022. The patients attending to OPD services and prescribed antibiotics were randomly selected. Copy of Prescriptions were analyzed for antibiotics prescribing patterns. All the information collected were Recorded in format made by referring to WHO prescribing Indicator form, detailed indicators Encounter Form, Facility indicator reporting form.¹⁰ Demographic of patients, departments visited, disease diagnosed, medicines used, number of medicines prescribed, Antibiotics prescribed, drugs per prescription, antibiotics per prescription, Drugs billed by pharmacy, cost of medicines were collected and recorded. Antibiotics utilization was assessed by using bills and prescription of the patient through Drugs use indicators suggested by a drug utilization research belong to WHO.¹¹ The study parameters include total drugs prescribed, total drug billed or available in pharmacy of hospital, total drugs to antibiotics ratio, antibiotics combination, banned drugs are also checked. Prescribed drugs were checked for adherence to guidelines using local formulary of hospital and national essential list of drug list (NEML).¹² Ethical clearance was taken from Institutional Review Committee, Bharatpur Hospital (Ref No.077/78-018). In descriptive Statistics categorical variable was expressed in frequency, percentage, while for continuous variables mean and standard deviation was calculated. Data was analyzed using SPSS 17.

RESULTS

Among 731 randomly sampled prescriptions, 384 (52.53%) found with at least one antibiotic were taken for further evaluation. Out of total 384 prescriptions taken for Analysis, 214 prescriptions (55.72%) were of female patients and 170 (44.27%) represented males. Mean age of study population was 37.71 with SD 25.01,

maximum age 97 years and minimum 1 month. Highest numbers of patients (21.09%) belong to the 15-29 Age group. Highest number of patients 158(41.15%) treated with antibiotics were seen in patient attending Medicine OPD. Most of the patient 45(11.72%) were in the 30-49 age group. Over all highest numbers 81(21.09%) of prescriptions were seen in patient of 15-29 age group. The age and gender distribution of Study is summarized in (Table 1).

Age	Gender	
	Female (%)	Male (%)
<5	15(7.00)	22(12.94)
5-14	30 (14.01)	20(11.76)
15-29	47(21.96)	34(20.00)
30-49	47(21.96)	31(18.34)
50-64	48(22.43)	27(15.88)
>64	27(12.62)	36(21.18)

of antibiotics were prescribed for the treatment. Total 30 antibiotics were prescribed for 577 times among them Amoxicillin-Clavulanate 70 (12.13%) were most frequently prescribed, in dentistry very few categories medicines were prescribed predominantly Amoxycillin CV 15, amoxicillin 4, metronidazole 10, Ornidazole 5, Azithromycin 1, six Patients visiting to psychiatric departments were also found be treated with antibiotic (Figure 1). Penicillin and Cephalosporins group of medicines were most frequently prescribed 24.11% and 19 % respectively. Most of the antibiotics were prescribed from medicine department i.e. 44% (Table 3)

(Signsandabbreviations:Den.-Dentistry, ENT-Ear Nose Throat, Gyn.-Gynecology, Med.- Medicine, NS- Neurosurgery, Ortho.-Orthopedics, Pead.-Pediatrics, NPNeuropsychiatry, GS-General Surgery) Table 4 summarized the facility of

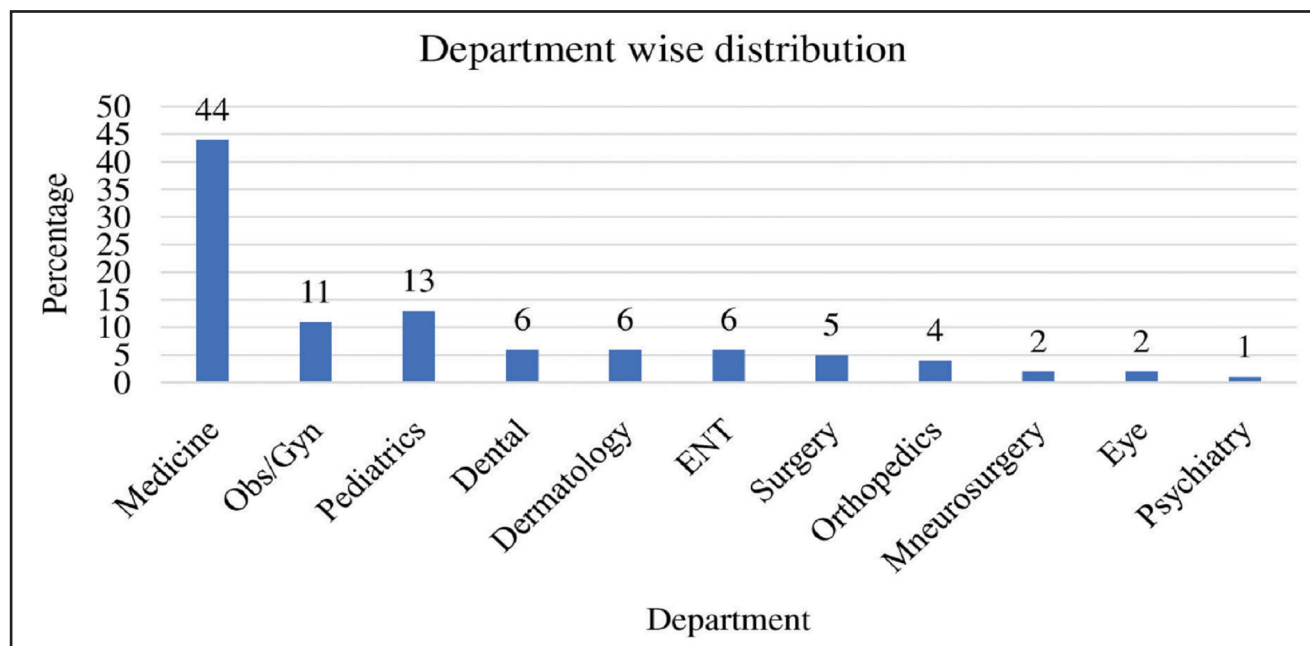


Figure 1. Department wise distribution.

Lowest prescriptions with antibiotics were prescribed to patient visited to psychiatric department 5 (1.30%). In medicine department highest number of antibiotics was prescribed 251(44%), in pediatric department 75(13%), while in Neuropsychiatry least number 6(1%)

Hospital showing average drug availability 50.36%. On average 2.328 drugs were billed per prescription. Antibiotics per prescription on average was 1.469. All the prescriptions were found to follow NEML while only 2.4 % of drugs

Antibiotics	Department visited											Total
	Den.	Derma	ENT	Gyn.	Med.	NS	Eye	Ortho.	Pead.	NP	GS	
Penicillin	13.87	0.73	7.3	4.38	39.42	2.92	0	6.57	15.33	0.73	8.76	137(24.11)
Macrolides	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	66(11.61)
Quinolones	0	0	14.14	16.16	49.49	0	11.11	1.01	1.01	1.01	6.06	99(17.42)
Cephalosporin	0	0.92	2.75	10.09	50.46	1.83	0	3.67	24.77	0	5.5	109(19.19)
Oral antifungal	0	65.71	0	25.71	8.57	0	0	0	0	0	0	35(6.16)
Nitroimidazole	23.81	1.59	3.17	12.7	28.57	3.17	0	1.59	17.46	3.17	4.76	63(11.09)
Miscellaneous	0	8.47	5.08	13.56	52.54	3.39	1.69	8.47	1.69	3.39	1.69	59(10.38)
Total	35(6.16)	31(5.45)	33(5.18)	60(10.6)	251(44.19)	12(2.1)	12(2.3)	23(4.04)	75(13.2)	6(1.1)	29(5.1)	

were prescribed in generic (Table 4).

Variable	Number
Percentage of Drug Available (Mean)	50.36
Billed medicine/prescription (Mean)	2.328
Total Drugs /Prescription (Mean)	4.623
Number of Antibiotics /Prescription (Mean)	1.469
Drugs from essential Drug list (%age)	100
Drugs prescribed by Generic name (%age)	2.4

DISCUSSION

Antibiotic prescribing patterns in any hospital can vary widely depending on factors such as hospital policies, clinical guidelines, antimicrobial resistance patterns and the expertise of healthcare providers. This study only included the prescriptions made for insurance patient as they were retained in hospital. Rest of outpatient not involved in government insurance were not included in study. There are other studies carried out using prescription made for health insurance the data on that study were extracted from register retrieved in two health care institutions.¹³ In this study, total 384 prescriptions were sampled; while more than double prescriptions were assessed in similar study carried out in Nigeria that is 804 prescription for one year.¹⁴ Higher number of the antibiotics were prescribed to female than male while in study done in Kathmandu the Number of male

patients were higher.¹⁵ Highest number of antibiotics was prescribed to patient with age range 31 to 49 years; a study in Yemen used different classification of age with mixed results in multiple institutions and referring a study observed with highest antibiotics consumed by Pediatric patients in Nepal.^{16,17} Highest number of antibiotics was prescribed for patients visited to medicines department of hospital where this study was carried and Upper respiratory tract infections were mostly shown by another study which are generally covered by Medicine and ENT department in current study as pneumonia was also separately assessed in that study.¹⁸ Penicillin and cephalosporins groups of drugs were commonly prescribed in our study and similar findings were observed in study done in Yemen.¹⁹ In given study frequently prescribed antibiotics include macrolides, Cephalosporins and fluroquinolones while a review also observed with same drugs those follows the frequency of Amoxicillin-Clavulanate in ICUs.²⁰ Cephalosporins mostly of recent generation and beta lactam antibiotics with Beta lactamase inhibitors are widely found to be observed by recent studies as older antibiotics and single classes are less effective due to increased Antimicrobial resistance of microorganism.²¹ In this Study availability of drugs were assessed only 50% drugs per encounter were made available by pharmacy while rest of drugs were suggest-

ed to buy outside the pharmacy; availability is poor compared to Iran where availability is not less 86 %. Average number of drugs prescribed per prescription in this study were more compared to Iran while surveyed in multiple health facility.²² In this study average number of drugs per prescriptions was 4.16 % while only 2.328 Drugs in average was billed per prescription comparison is made with a study carried out in India showing average number of drugs prescribed 4.1 and 3.7 in Bangladesh.¹ Given study observed maximum number of antibiotics prescribed per prescription is 4 in only 2 prescription. All drugs belong to essential drug list while only 52.9 % antibiotics were observed from essential drug list in study of Chittagong.²³

Limitations

The study population were those who were involved in health insurance Scheme. Comparison between insurance and non-insurance patient was not done. Seasonal impact, economic factors were not assessed in this study. Diagnosis based

antibiotics prescription, adherence of patient and outcome of therapy was not analyzed.

CONCLUSIONS

Only about half of prescribed medicines were available to the patient, 1.465 average number of antibiotics were prescribed per prescriptions so the facility should work on good supply chain management. Female are observed more than male population. Third generation cephalosporins and Amoxicillin-Clavulanate were used in remarkable frequency. Almost all the antibiotics were prescribed empirically which might leads to possible emergence of resistance. So, the proper institution-based evidence-based guidelines should be established and followed, regular drug use review and antibiotic stewardship is desirable in facility.

Conflict of interest: None

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