DRUG UTILIZATION PATTERN USING WORLD HEALTH ORGANIZATION PRESCRIBING INDICATORS AT OTORHINOLARYNGOLOGY OPD OF A TERTIARY TEACHING HOSPITAL OF EASTERN NEPAL

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ABSTRACT

Introduction

Assessment of drug utilization pattern using the World Health Organization (WHO) prescribing indicators is important to promote rational drug therapy. It needs to be evaluated periodically to obtain information about drug utilization pattern, to detect early signals of irrational use of drugs and to provide feedback to prescribers.

Objective

The objective of the present study was to assess the drug prescribing patterns in the Otorhinolaryngology OPD based on the WHO prescribing indicators.

Methodology

A cross-sectional study was conducted among 148 outpatients at Department of Otorhinolaryngology and HNS B.P. Koirala Institute of Health Sciences for six month duration from February 2019 to July 2019. Patients aged 18 years and above and prescribed at least one drug were enrolled. Medical case sheets of the every fifth patients visiting the OPD were reviewed to collect the relevant data on a self-designed proforma. Descriptive statistics and WHO prescribing indicators were calculated using SPSS version 11.0. The study was approved by Institutional Review Committee, B.P. Koirala Institute of Health Sciences.

Results

A total of 322 drugs were prescribed to 148 patients. Most of the drugs were prescribe through oral route (69.3%). Levocetrizine (10.6%) was the commonest prescribed drug followed by Ibuprofen+Paracetamol (10.2%) and Pantoprazole (10.2%). Among systemic antibiotics, Amoxicillin+Clavulanic acid (35.9%) was the most frequently prescribed followed by Cefixime (12.8%) and Levofloxacin (12.8%). Ofloxacin + Dexamethasone (22.9%) was the most frequently prescribed topical drug followed by Mometasone (17.7%). The average number of drugs prescribed per encounter or mean was 2.2 (range 1-5). The percentage of encounters in which an antibiotic was prescribed was 33.2%. The percentage of drugs prescribed by generic name and from National List of Essential Medicine (NLEM) was 28% and 31.9% respectively.

Conclusions

The drug utilization pattern did not comply with the most of the WHO prescribing indicators. The average number of drug per prescription was higher than recommended by WHO, generic prescribing was remarkably lower and prescribing from NLEM was also low.

KEY-WORDS

Drug utilization; outpatients; prescribing

INTRODUCTION

Drug utilization research is defined as the marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences.[1] Assessment of drug utilization patterns is becoming increasingly necessary to promote rational use of medicines globally.[2] The assessment is also important for clinical, educational and economic purposes. It needs to be evaluated periodically to obtain information about drug use patterns, to detect early signals of irrational drug use, to identify interventions to improve drug use and to provide feedback to prescribers.[3] Proper prescribing habits and rational use of medicines can play a significant role in ensuring quality care at health centers.[4]

More than half of all medicines are prescribed, dispensed, or sold improperly and 50% of patients fail to take them correctly which leads to ineffective treatment, harm to the patient, increased treatment cost and development of drug-resistant organisms.[5,6] Before starting various activities to promote rational drug use, an effort should be made to describe and quantify the situation.[6] WHO prescribing indicators are widely accepted method in over 30 developing countries for problem identification related to drug utilization.[7]

Diseases of the ear, nose and throat (ENT) often cause significant morbidity impairing routine life of adults as well as children.[7] Non-specific upper respiratory tract infection, acute tonsillitis, rhinosinusitis and otitis media are the most common ENT infections and account up to 75% of all antibiotic use.[8] Various studies has reported that irrational prescription of drugs is highly prevalent in Nepal and there is immense scope of improvement in prescribing drugs in the hospital settings.[9,10] Information on the prescribing patterns of drugs among outpatients at Otorhinolaryngology and Head and Neck Surgery (ORL & HNS) department are lacking in Eastern Nepal. The objective of the study was to assess the drug prescribing patterns in the outpatientsat ORL & HNSdepartment by using WHO prescribing indicators.

METHODOLOGY

Across-sectional study was conducted among patients visited outpatient department of Otorhinolaryngology and Head and Neck Surgery (ORL & HNS) at B.P. Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal from February 2019 to July 2019. Patients aged 18 years and above and prescribed at least one drug were enrolled in the study. Patients unable to communicate and those admitted into the ward were excluded from the study. Sample size was calculated using the formula Z^2*p*q/L^2 in which prevalence (p) was 45.5% at 95% confidence interval, 20% margin of error and 80% power.[11] A clear explanations of the purpose and nature of the study was given to the patients in a language they understood and written consent was obtained. A self-designed proforma was used to collect the data. Medical case sheets of every fifth patient were reviewed to record the relevant data like demographics, diagnosis and drugs prescribed (dose, route of administration, pharmacological classification and marketing categories generic or branded, single or fixed dose combination). The National list of Essential Medicines (fifth revision) was used as a basis to determine drugs as generic or brand name.[12] Two or more drugs that are prescribed in a fixed dose ratio for a given health condition were categorized as Fixed Dose Combination (FDC).No incentives were given to the patients. Personal identifying information was not collected to maintain the confidentiality. The prescribers were unaware of the study which helped to minimize the Hawthorne effect.[13]

Data were entered in Microsoft Excel 2010 and analyzed using SPSS version 11.0. Descriptive statistics mean, standard deviation, frequency and percentage were calculated. The following WHO prescribing indicators were calculated:

i) Percentage of drugs prescribed by generic name were calculated by dividing the number of drugs prescribed by generic name by total number of drugs prescribed, multiplied by 100.

ii) Percentage of encounters in which an antibiotic prescribed were calculated by dividing the number of patient encounters in which an antibiotic is prescribed by the total number of patients, multiplied by 100.

iii) Percentage of encounters with an injection prescribed were calculated by dividing the number of patient in which an injection is prescribed by the total number of patients, multiplied by 100.

iv) Percentage of drugs prescribed from National List of Essential Medicine (NLEM) were calculated to measure the degree to which practices conform to a national drug policy as indicated in the list.[12] It was calculated by dividing number of products prescribed which are in essential drug list by the total number of drugs prescribed, multiplied by 100.

v) Percentage of fixed-dose combination (FDC) prescribed = Number of FDC/Total drugs*100.

RESULTS

Out of 148 patients, the majorities were female (54.7%), married (74.3%), aged 18-30 year (42.6%), literate (73.4%) and employed (66.9%). Most of the patients suffered from ear diseases (Table 1)and 15 (10.1%) patients had co-morbidities. Out of these, hypertension (6.1%) was the

Table 1: Sociodemographic characteristics of the patients (n=148)

Variables		Frequencyn (%)
Sex	Male	67 (45.3)
	Female	81 (54.7)
Marital status	Married	110 (74.3)
	Single	38 (25.7)
Age group (years)	18-30	63 (42.6)
	31-45	45 (30.4)
	46-60	23 (15.5)
	>60	17 (11.5)
Residence	Province 1	128 (86.5)
	Province 2	16 (10.8)
	India	4 (2.7)
Educational level	Illiterate	35 (23.6)
	Secondary	23 (15.5)
	Intermediate and above	90 (60.8)
Occupation	Employed	99 (66.9)
	Unemployed	49 (33.1)
Diseases associated with	Ear	67 (45.3)
	Throat	39 (26.4)
	Nose	18 (12.2)
	Head and neck	15 (10.1)
	Oral cavity	9 (6.1)

The most common disease diagnosed was chronic suppurative otitis media (19.6%) followed by otitis externa (10.1%) and pharyngitis (10.1%) (Figure 1).

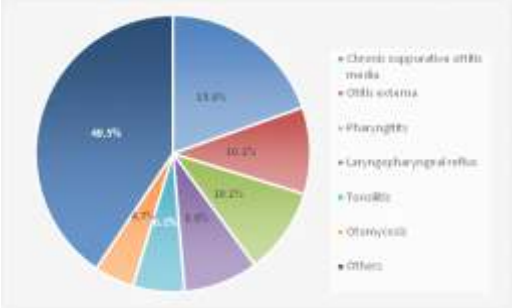

Figure 1: List of diseases diagnosed in the patients (n=148)

A total of 322 drugs were prescribed to 148 patients during the study period. Most of the drugs were prescribed through oral route (69.3%) followed by topical route (30.4%) and injection (intralesional) route(0.3%). Anti-histaminics (17.4%) were the commonest prescribed group of drugs followed by antimicrobial agents (15.8%) and proton pump inhibitors (14.6%) (Table 2).

Table 2: Therapeutic group of drugs prescribed to the patients (n=322)

Variables	Frequencyn (%)
Antihistaminic (H_1 blockers)	56 (17.4)
Antimicrobial agents	51 (15.8)
Proton pump inhibitors	47 (14.6)
Non-steroidal anti-inflammatory drugs	38 (11.8)
Antimicrobial agents with steroids	35 (10.8)
Steroidal anti-inflammatory drugs	25 (7.8)
Prokinetics	14 (4.3)
Mouthwash	18 (5.6)
Nasal decongestant	7 (2.2)
Vitamin	5 (1.6)
Others	26 (8.1)

Most of the patients (40%) were prescribed 2 drugs followed by one drug (29%) and three drugs (17%). Five drugs were prescribed in 3% of the patients (Figure 2).

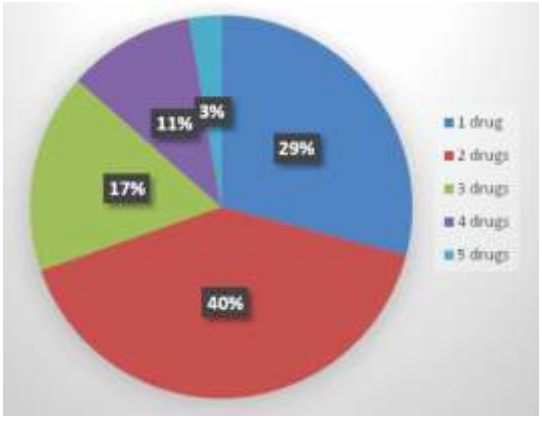

Figure 2: Number of drugs prescribed (n=148)

Levocetrizine (10.6%) was the commonest prescribed drug followed by Ibuprofen+Paracetamol (10.2%) and Pantoprazole (10.2%) (Table 3).

Table 3: List of individual drugs (n=322)

Variables	Frequencyn(%)
Levocetrizine	34 (10.6)
Ibuprofen+Paracetamol	33 (10.2)
Pantoprazole	33 (10.2)
Ofloxacin+Dexamethasone	22 (6.8)
Fexofenadine	20 (6.2)
Mometasone	17 (5.3)
Amoxicillin+Clavulanic acid	14 (4.3)
Itopride	14 (4.3)
PolymixinB+Chloramphenicol+Dexamethasone	9 (2.8)
Esomeprazole	8 (2.5)
Others	118 (36.6)

A total of 39 (12.1%) systemic antibiotics were prescribed. Penicillin (43.6%) was the most frequently prescribed systemic antibiotics followed by Cephalosporins (20.5%) and Fluoroquinolones (17.9%) (Figure 3).

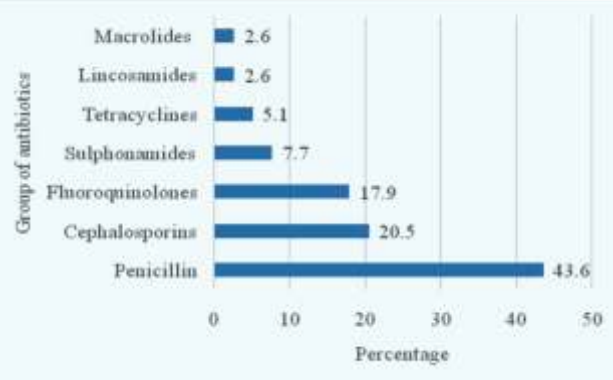

Figure 3: List of therapeutic group of systemic antibiotics prescribed (n=39)

Amoxicillin+Clavulanic acid (35.9%) was the most frequently prescribed systemic antibiotic followed by Cefixime (12.8%) and Levofloxacin (12.8%) (Table 4).

Table 4: List of individual systemic antibiotics (n=39)

Variables	Frequencyn (%)
Amoxicillin+Clavulanic acid	14 (35.9)
Cefixime	5 (12.8)
Levofloxacin	5(12.8)
Ampicillin+Cloxacillin	3(7.7)
Cefuroxime	3(7.7)
Cotrimoxazole	3(7.7)
Doxycycline	2 (5.1)
Azithromycin	1 (2.6)
Ciprofloxacin	1 (2.6)
Clindamycin	1 (2.6)
Ofloxacin	1 (2.6)

A total of 96 topical drugs were prescribed to 148 patients. Steroids with antimicrobial agents (36.5%) was the commonest group of topical drug followed by steroidal anti-inflammatory agent (19.8%), mouthwash (18.8%) and antimicrobial agents (14.6%). Ofloxacin + Dexamethasone (22.9%) was the most frequently prescribed topical drug followed by Mometasone (17.7%) (Table 5).

Table 5: List of individual topical drugs prescribed (n=96)

Variables	Frequencyn (%)
Ofloxacin + Dexamethasone	22 (22.9)
Mometasone	17 (17.7)
Polymixin B + Chloramphenicol + Dexamethasone	9 (9.4)
Povidone iodine	7 (7.3)
Chlorhexidine	5 (5.2)
Oxmetazoline	6 (6.2)
Mupirocin	5 (5.2)
Benzydamine	4 (4.2)
Clotrimazole	4 (4.2)
Others	17 (17.7)

The WHO prescribing indicators are given in the Table 6. The average number of drugs per prescription was 2.2. Only 5% drugs were prescribed by generic name and only 31.9% of the drugs were from National list of Essential Medicines (fifth revision).[12]

Table 6: WHO prescribing indicators (n=322)

Indicators	Findings
Average number of drugs per prescription	2.2
Percentage of drugs prescribed by generic name	5%
Percentage of prescription in which an antibiotic prescribed	33.2%
Percentage of prescription in which an injection prescribed	0.3%
Percentage of drugs prescribed from the National List of Essential Medicine	31.9%
Percentage of fixed-dose combination (FDC) prescribed	31.4%

DISCUSSION

Evaluation of the drug utilization pattern from time to time is important for obtaining the data so that suitable modifications can be made in the prescribing patterns to increase the rationale prescription. Early signals of irrational use of drugs can be detected by frequent drug utilization studies conducted at certain time interval.[14] The present study has highlighted the general trends of prescribing drugs in the outpatients of ORL & HNS department at a tertiary care hospital in Eastern Nepal. The drug utilization pattern did not comply with the most of the WHO prescribing indicators in the study. The average number of drug per prescription was slightly higher than the recommended, generic prescribing was remarkably lower, antibiotics prescribed were higher and prescribing from NLEM was also low.

The age distribution of the patients showed that young patients (18-30 years) constituted the highest number visiting the ENT OPD and this finding was comparable to Ain et al and Sumanlatha et al.[11,15] The younger generations may be more conscious about their health issues and also they represent higher proportion of the population in our country. The female patients made more visits than males in our study. However, the higher number of male patients has been noted in other studies.[11,15] Nepalese female population being less employed than the male, they can spare their time in making hospital visits.[16] This might also have contributed to higher number of female visitors to the outpatient department of ORL and HNS in our study. The most frequent comorbid condition of the study population was found to be hypertension followed by diabetes mellitus. In contrast to this Ain et al. have reported diabetes mellitus as the most concomitant condition.[11] We observed that the most of the patients were suffering from chronic suppurative otitis media (CSOM) and similar finding was reported by Bhat et al.[17] However, Ong et al reported that the most common ear infection they noticed was acute otitis media (AOM).[18] This might be due to seasonal variation in ear infections.

One out of three patients were prescribed drugs through topical routes in our study. In a similar study, every other patient was prescribed topical drugs.[17] In contrast, most of the drugs were prescribed by oral route in other study.[15] Most of the patients (40%) were prescribed two drugs. However, only one drug was prescribed to most of the patients in various Indian studies.[11,19] Similarly more than three drugs were prescribed in majority of the patients in other studies.[15,20]

Antihistaminic were the commonest prescribed group of drugs followed by antimicrobial agents and proton pump inhibitors and this was not in consistent with other studies in which antibiotics were the most commonly prescribed drug.[15,19,20] Levocetrizine was the commonest prescribed drug followed by Ibuprofen+Paracetamol.However, amoxicillin was the most commonly prescribed drug in an Indian study.[19]

In our study systemic antibiotics were prescribed only in 12.1% patients. A higher number of patients were prescribed oral antibiotics in an Indian study.[17] Penicillin was the most frequently group of prescribed systemic antibiotics and similar finding was also reported by Sumalatha et al.[15] Amoxicillin-clavulanic acid was the most common antimicrobial agent prescribed in our study and this was in accordance with other studies.[11,17,21] Ofloxacin + Dexamethasone was the most frequently prescribed topical drug in our study. In contrast to this finding, Xylometazoline was the most frequently prescribed topical drug in an Indian study.[17] These differences may be due to seasonal variations in disease occurrence. In our study there were more cases of infections of ear. Ofloxacin was the most frequently prescribed topical antimicrobial agent. In contrast to this, Polymyxin B was the most commonly prescribed topical antibiotic in an Indian study.[21]

The average number of drugs per prescription was 2.2 which is slightly higher than the standard value.[22] In similar study, the average number of drugs per prescription was three.[17] A lower average number of drugs (1.5) was reported by Ain et al.[11] The variation in the average number of drugs per prescription may be due to various factors including difference in characteristics of health care delivery system, socioeconomic profile and morbidity in the population. The results of our study reflects polypharmacy which might have lead adverse drug reactions, drug interactions, medication error, decrease patient adherence and increase drug expenses.[23,24] A high average number of drugs might be influenced by financial incentives to the prescribers. The percentage of drugs prescribed by generic name in our study was only 5% which is far below the standard derived to serve as ideal (100%).[22] Percentage of drugs prescribed by generic name was 86.5% in an Indian study.[15] India is one of the biggest manufacturer and supplier of generic drugs and hence its prescription is high.[25] Lower prescription of generic drugs in our study is due to low production and availability of generic drugs in Nepal. The pharmacists may dispense whatever they want to dispense if generic drugs are prescribed. If generic medicines is made available and have the same high quality, strength, purity and stability as brand-name medicines, their prescription may increase. The use of generic names is recommended by WHO and regarded as an important factor for promoting rational use of drugs and it also contributes to reduction in cost of the therapy.[26] At least two-thirds of the drug therapy cost can be saved if generic medicines are prescribed.[27] The percentage of encounters in which antibiotics were prescribed was 33.2%, which is slightly high compared to the standard (20.0-26.8%).[22] The high percentage of antibiotics prescribed in our study may be influenced by various factors including cultural beliefs about antibiotics, patient expectation to receive antibiotics and prescribers' belief. This finding suggests that prescription of antibiotics needs to be regulated. Drug utilization studies should be done time to time to evaluate whether the antibiotics were prescribed appropriately or not. Our study revealed that the percentage of drugs Prescribed from NLEM was 31.9% which is far below than the ideal (100%).[22] Possible explanations for this could be lack of understanding, awareness and importance of essential drug concept and formulary among the prescribers. Prescribing from the NLEM can reduce the number of irrational prescription and also reduce the cost of drug therapy. One third of the prescription were FDC in our study. The use of FDC reduces the number of pills to be taken and hence improve patient adherence. However, there are certain drawbacks of FDC which includes inflexible fixed dose ratio, incompatible pharmacokinetics, increased toxicity and cost of therapy. Therefore, use of FDC should be discouraged unless strictly necessary.

LIMITATIONS

It was conducted in a single department and single hospital and hence cannot be considered as a representative of whole Nepal. Although the number of patients enrolled in the study was higher, seasonal variation was not included as it was conducted in a single season which might influence the morbidity pattern. The study lacked information about antimicrobial sensitivity pattern and definite bacterial etiology.

CONCLUSION

Within limitation of the study, our study concludes that the drug utilization pattern did not comply with the most of the WHO prescribing indicators. The average number of drug per prescription was higher than recommended by WHO, generic prescribing was remarkably lower, antibiotics prescribed were higher and prescribing from NLEM was also low. Educational interventions would promote rational drug prescriptions among the prescribers.

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CONFLICT OF INTEREST

No conflict of interest

FINANCIAL DISCLOSURE

None declared

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