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Original Research Article

Drug utilization pattern of antimicrobial agent used in ear, nose and throat outpatient and inpatient department at tertiary care teaching centre

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ABSTRACT

Background: The prospective, observational study was designed to assess the prescribing pattern of drug usage in ENT Department in various diseases conditions.
Methods: Medication utilization Form has been designed based on a WHO format. The patient's details including patient particulars, diagnosis, investigations, drug details and information regarding the indication for prescribing agents. Patient were enrolled those are either gender with age more than 20 years, outpatients and in patients who are treated in ENT department and who are diagnosed as acute and chronic disease. Exclusion criteria were below the age of 20 years, the patients who were not willing to take antimicrobial agents and those were not able to give consent were excluded.
Results: Total 1021 prescriptions were analysed, 38.5% were males and 61.5% were females, respectively. 319 of patients were diagnosed with ear, 157 with nose and 489 with throat disorders. The most common disease reported was CSOM in 134 patients and least were only one patient with myringitis. The most frequently prescribed antibiotics were β-lactams was commonly prescribed and least were nitroimidazoles. In the concomitant medications, aceclofenac and serratiopeptidase were most commonly prescribed and least were pantoprazole and domperidone.
Conclusions: Prescribing pattern of usage of antibiotics are more compared to other drugs, β Lactams antibiotics are most commonly prescribed antibiotics in various ENT diseases, usage of brand name are higher than the generic name.

Keywords: Antibiotic, Drug utilization, ENT

INTRODUCTION

Drug utilization is defined as "the prescribing, dispensing, administering, and ingestion of drugs". The World Health Organization (WHO) expands on this definition by comprising consequence variables in their explanation.[1] Drug utilization is well-defined by the WHO as the "marketing, distribution, prescription, and usage of drugs in society, with special importance on the subsequent medical, social, and economic consequences.[2]

Disease of the ear, nose and throat (ENT) is actual common complications in children and adults will cause impairment of routine life. The ENT infections produced by various microorganisms like bacteria, viruses and fungi. It affects all age groups, from children to adults.

ENT infections have severe consequences such as hearing impairment and emotional stress which however, seems to worse the patient's quality of life.[3]

The most of the antibiotics were recommended for respiratory and ENT infections with a supposed viral aetiology, such as rhino-pharyngitis and acute bronchitis. The consequences of the various reviews were in agreement showing that antibiotic prescriptions are made in around 40% of all consultations for rhino-pharyngitis and in 80% of those for acute bronchitis.[4] Antibiotics were prescribed in more than 90% of cases of pharyngitis, irrespective of the age of the patient. The variability in antibiotic prescription is attributable to the infecting organisms and antimicrobial sensitivity that vary from country to country, or even from region to region, but other features also involved comprising physician favourite, local policy, costs and lack of local guidelines.[5]

India is one of the country where the problem of resistance is most prominent. In particular, the rates of resistant pneumococci in Indian nations have been disturbing. In India, approximately 100% of the healthy people carries bacteria that are resistant to chloramphenicol, ampicillin, nalidixic acid and trimethoprim.[6] Poor patient compliance or noncompliance with drugs is mainly in clinical practice. It has been found to be accompanying with treatment failure and all its significances, namely, worsening of patients' health, additional hospital admissions, the requirement of extra consultations, the use of additional medications and expansion in direct and indirect expenses of disease management.[7]

Despite several years of clinical use of antibiotics, little is known about how these medications should be used optimally in the clinic. An essential and still mainly unanswered question is how antibiotics should be dispensed clinically to decrease resistance progress without compromising efficacy and safety.[8] The International Network for the Rational Use of Drugs (INRUD) was established in 1989 to promote the rational use of drugs in developing countries. Several indicators were developed by INRUD in association with WHO that provided objective indices permit for valuation of drug use.[9] Still, there is a necessity for statistics on both antibiotic use and determinants of use from all the provinces of the world.

It is most essential to investigate and supervise prescribing patterns of medicine usage time to time, the basic drug alteration in recommending design to progress the remedial value and decreases the side effects. Drug usage assessment is a continuing, certified and systemic quality enhancement procedure, which is designed to review the medicines which are recommended to the patients, provide a right response to the clinician/other appropriate groups, develop criteria and principles that define optimum drug usage, encourage suitable drug use through education and council the patients. These types of analyses will assistance for health specialists to recommending design of antibiotic rationally and therefore are extreme needed. Here the present demonstration has been designed to express the usage of antibiotic in ENT department of RAMA Medical College, Hapur, India Based on the study results appropriate interventions at the level of the physician and the Institute can be planned to promote rational use of drugs in our set up.

Hence, the present prospective study was aimed to evaluate drug utilization pattern of antibacterial used in ENT infections in patients of outpatient (OPD) and inpatient (IPD) departments at RAMA Medical College, Harpur, India.

METHODS

This was a prospective and observational study conducted at RAMA Medical College, Harpur. The study was conducted over a period of eight months from January 2019 to August 2019. All in-patients who were presented to the ENT Department of the hospital during the study period were enrolled into study. Patient who met the following criteria were enrolled.

Patient were enrolled those are either gender with age more than 20 years, outpatients and in patients who are treated in ENT department and who are diagnosed as acute and chronic disease.

Exclusion criteria

Exclusion criteria were below the age of 20 years; the patients who were not willing to take antimicrobial agents and those were not able to give consent were excluded; those patients who do not want to participate into the study were also excluded from the study.

Ethical approval

The study was approved by the Institutional Ethical Committee of RAMA Medical College, Harpur

Sources of data

Demographic details of the patient and treatment chart were sources of the study data.

Study procedure

The study was started after obtaining the approval from institutional ethical committee (IEC) of RAMA Medical College, Hapur.

Patients who satisfied the above study criteria were included in the study after taking the informed consent. All the information was recorded in case record form (CRF) which was designed according to WHO

criteria. Patient's demographic details, complaints, diagnosis, and prescribed drugs was collected from the Prescription form or Case records of the patient and was documented in a suitably designed data collection form.

Statistical analysis

The data were entered in Microsoft excel and data were analysed by SPSS software version 20.

RESULTS

In this study, a total of 816 prescriptions were analysed.

Table 1: Distribution of age group (n=816).

Age group in years	No. of patients	%
<21	187	22.9
21-30	213	26.1
31-40	197	24.1
41-50	128	15.6
51-60	49	6.00
>61	42	5.14

Age distribution of patient

In Table 1, the majority patients were between 21-30 years accountable 26.1% and least age group patients were more than 60 years 5.14%.

Table 2: Distribution of gender (n=816).

Gender	No. of cases	Percentage (%)
Male	311	38.1
Female	505	61.9

Gender distribution of patient

In Table 2, the gender ratio of the patients' Female: Male was found to be 1.53:1. Out of the 816 patients, 61.9% (505) of patients were female and remaining 38.1% (311) of patients were male. Test of proportion showed that the female patients were more than the male patients.

Table 3: Distribution of region (n=816).

Region	No. of cases	Percentage (%)
Rural	529	64.8
Urban	287	35.2

Distribution of region

In Table 3, patients were predominantly from Rural areas (64.8%) compared to the urban areas at 35.2%.

Educational qualification

In Table 4, In our study it was found that ENT patients is more prevalent among illiterate group 30.8% and least were graduate 11.1%.

Table 4: Educational qualification (n=816).

Variables	No. of cases	Percentage (%)
Illiterate	252	30.8
Primary school	124	15.1
Secondary school	227	27.8
Intermediate college	122	14.9
Graduate	91	11.1

Table 5: Disease wise distribution of patients.

Organ	Infections	No. of patients	Percentage (%)
Ear	Tubotympanic (CSOM) safe	134	16.4
	Atticoantral	72	8.8
	Otitis media with effusion (NSOM)	83	10.1
	CSOM with otomycosis	6	0.7
	NSOM with otomycosis	3	0.3
	Otomycosis	4	0.4
	Traumatic ear perforation	3	0.3
	Otitis externa (furuncle)	4	0.4
	Wax with otitis externa	2	0.2
	Tubercular otitis media	2	0.2
	Myringitis	1	0.1
	Total	314	41.7
Nose	Rhinitis	19	2.3
	Acute sinusitis with rhinitis	21	2.5
	Chronic sinusitis	23	2.8
	Vestibulitis	17	2.0
	Epistaxis	11	1.3
	Nasal polyps with allergic rhinitis	12	1.4
	Nasal bone fracture	9	1.1
	Dacryocysts	6	0.7
	Total	118	14.4

Continued.

Organ	Infections	No. of patients	Percentage (%)
Throat	Sore throat (reflux) LPP	122	14.9
	Acute pharyngitis	43	5.2
	Acute tonsillitis	41	5.0
	Acute tonsillopharyngitis	43	5.2
	Acute laryngitis	19	2.3
	Growth oropharynx	17	2.0
	Chronic tonsillitis	43	5.2
	Total	328	40.1
Combination of ENT infections	Upper respiratory tract infection (URTI) and otomycosis	2	0.2
	URTI and ASOM	16	1.9
	URTI and CSOM	21	2.5
	Chronic sinusitis with chronic tonsillitis	9	1.1
	Acute sinusitis with tonsillopharyngitis	8	0.9
	Total	56	6.8
Grand total		816	100

Table 6: Relationship between type of infection and class of antimicrobial agent prescribed in ENT.

Organ	Class	No. of agents prescribed	Percent
Ear	β-lactams	521	63.84
	Quinolones	17	2.08
	Aminoglycosides	49	6.00
	Macrolide	4	0.49
	Nitroimidazoles	3	0.36
	Total	594	72.79
Nose	β-lactams	71	8.70
	Quinolones	9	1.10
	Aminoglycosides	5	0.61
	Macrolide	3	0.36
	Nitroimidazoles	1	0.12
	Total	89	10.90
Throat	β-lactams	73	8.94
	Quinolones	17	2.08
	Macrolide	43	5.26
	Total	133	16.29
	Grand total	816	100

Table 7: Concomitant prescribed drugs.

Concomitant prescribed drugs	No. of drugs	Percentage (%)
Aceclofenac and serratiopeptidase	127	39.0
NSAIDs and antihistamines	53	16.3
Pantoprazole and domperidone	7	2.1
Rabeprazole and domperidone	9	2.7
Mucolytic agents	53	16.3
Nasal decongestant	67	20.6
Anti-allergic (cetirizine)	9	2.7
Total	325	100

Out of the 816 patients, 314 patients were diagnosed with ear disease, 118 patients with nose diseases, 328 patients with throat disease and 56 patients with combination of ENT infections.

In Table 6, a total number of 816 prescriptions contained antibiotics. β lactams was most commonly prescribed, followed by quinolones and aminoglycosides. Macrolide and nitroimidazoles was least prescribed.

Table 7, the maximum concomitant prescribed drug was aceclofenac and serratiopeptidase and least combination were antacid and antiemetic such as pantoprazole and domperidone.

Table 8: Concomitant disease conditions.

Concomitant condition	No. of patient	%
Diabetes mellitus	121	11.8
Hypertension	68	6.66
Gastritis	16	1.56
Hypothyroidism	23	2.2
Rheumatoid arthritis	18	1.76
Tuberculosis	13	1.27
Total	259	25.3

Table 8, the mostly comorbid disease conditions was diabetes and least comorbid disease tuberculosis.

DISCUSSION

The Drug prescription by the physician reveals important data regarding rational drug usage. In general practice, the therapeutic approach for ENT infections is nearly empirical and the main aim of physicians is to treat as specifically as possible, while covering the most likely pathogens. The present study indicates general prescribing trends of antibiotics in the OPD and IPD of ENT department. A total of 976 prescriptions were analysed and the demographic data showed that the number of female patients suffering from ENT disease was more than the number of male patients. Similar findings were reported in a study conducted by by Harish et al.[10] This higher incidence in females may be due to increased exposure of females to kitchen smoke.[11,12] Majority of the patients were in age group less than 30 years, indicating that most of ENT diseases are common in young adults and children.

Throat infections were the most common infections (40.19%) followed by ear infection (38.4%), followed by infections of nose (14.4%). This is similar to one such study conducted by Farhan et al showing higher incidence of throat infections (50.8%), followed by ear (31.37%) and least were nose infections (26.47%).[13] In the present study, β lactams antibiotics was the most commonly prescribed, followed by quinolones and aminoglycosides. Macrolide and nitroimidazoles was least prescribed. A similar study reported that β-lactam antibiotics (amoxicillin, amoxicillin-clavulanate, cefdinir, cefpodoxime proxetil and cefuroxime axetil) are all considered appropriate for the initial treatment of acute bacterial rhino sinusitis in children.[14] It is well known that indiscriminate use of broad spectrum antibiotics increases bacterial resistance.[15] So, the use of azithromycin and clarithromycin should be indicated only when their broad coverage is required or when other antibiotic use is prohibited due to allergy, etc.

However, a change in the prescribing patterns from a small spectrum to penicillin to amoxicillin/clavulanate, as indicative in our study, could be due to an increase in antibiotic resistance which encourages physicians to choose a broader and safer option. In our study, β-lactams (cefixime) was most commonly prescribed antibiotic. The reason for prescribing the third generation cephalosporins was the preponderant mixed group of infections. This contradicts the study conducted by Ain et al who conducted their study and documented Amoxicillin as the most common antibiotic prescribed.[16]

Apart from antimicrobial agents, NSAIDs, H1 antihistaminic, H2 blocker and steroid were prescribed concomitantly for symptomatic relief. Few patients with non-specific throat complaints received antimicrobial therapy. We observed laryngopharyngeal reflux as the most common cause and these patients were responded very well to the proton pump inhibitors. Good numbers of patients were with nasal decongestion complaints were treated with nasal decongestant (xylometazoline). We see that most of the antibiotics used in patients with Sore throat is an overcautious approach of most of our contemporaries. The reason for higher prescription of PPI's in sore throat was rational which was evaluated by means of indirect laryngoscopy or video laryngoscopy in all patients. Majority of the antibiotics were prescribed on grounds of presumption and clinical experience of the physicians. Polypharmacy is known to cause unnecessary adverse reactions, drug interactions, complications, medication non-adherence and increase cost of therapy.[17]

A significant number of patients were suffering from concomitant diseases. The most frequent comorbid condition of the study population was found to be diabetes (11.8%), followed by hypertension (6.66%), hypothyroidism, gastritis and tuberculosis were least patients. In a similar study, Mazzaglia et al have reported liver disease as the most concomitant condition, followed by diabetes mellitus, heart disease, ischemic heart disease, malignant neoplasm in acute URTIs.[18] Huchon et al. have reported that the rate of chronic disease was highest in Italy (52%) and lowest in Spain (38%).[19] Therefore, our study indicates that the percentage of concomitant disease (32.2%) was lower than the percentage found in Italy and Spain, whereas diabetes was reported to be common concomitant condition against liver disease in the above-mentioned literature. Cost of antibiotics could be one of the major contributing factors for noncompliance in a developing country like India.

The major numbers of prescriptions were by their brand names which may be because of drug promotional activities by pharmaceutical industries. Numbers of prescriptions with drugs by generic names were less.[20] Prescribing the antimicrobial agents by brand names may affect some of the features of essential drug concept. The overall health expenditure can be reduced by prescribing the drugs by generic names. However, in spite of all these

limitations, our study shows few rational prescribing practices. Prescription of antimicrobials in ear, nose and throat infections were according to standard treatment guideline. Continuous motivation, education and monitoring are needed at different levels to encourage rational use of medicines.

CONCLUSION

Fluoroquinolone and *β*-lactam were the two most frequently prescribed antimicrobial agents which are included in essential drug list. The use of the generic names was found to be satisfactory, but the average number of drug per prescription was high. This outcome is an important tool to guide hospitals and doctors to develop antibiotic policy that helps to decrease chance of antimicrobial resistance and motivate cost effective utilization of antimicrobial agents.

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