

## Drug utilization study in the otorhinolaryngology department in a tertiary care hospital

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### ABSTRACT

**Background:** Drug utilization is defined by the World Health Organization (WHO) as the marketing, distribution, prescription, and use of drugs in society, with special emphasis on the resulting medical, social, and economic consequences. The aim of this study was to evaluate the pattern of prescription and then drug utilization in outpatient (OPD) of the Department of Otolaryngology in a tertiary care teaching hospital.

**Methods:** This was a retrospective study conducted at the A.C.S. medical college and hospital, Chennai for a period of 7 months. All the patients who attended the Ear Nose and Throat (ENT) OPD were included. The total number who attended the OPD was 10,249 which include 6,956 new cases and 3313 old cases.

**Results:** The antibacterials commonly used were  $\beta$  Lactams (56%), macrolides (14%), fluoroquinolones (12%), aminoglycosides (8%). Among the penicillin group, the commonest drug prescribed was a combination of amoxicillin and clavulanic acid (27%), in cephalosporins was cefixime + clavulanic acid (19%). Aminoglycosides include gentamycin in refractory cases. Fluoroquinolones include ciprofloxacin and levofloxacin. Others Drugs like antihistamines and mucolytics were prescribed in 27%, anti-ulcer drugs in 36% cases, analgesics in 33% cases and herbal medicines in 4%. The average number of drugs used in each prescription was 3.20. All the drugs were prescribed with brand names. The average cost per prescription per day for OPD patients is 37 Rupees.

**Conclusions:**  $\beta$  Lactams were commonly used antibacterials in the otorhinolaryngology department.

**Keywords:** Drug utilization, Prescription pattern, Pharmacoeconomics, Otorhinolaryngology department, Antibacterial agents

### INTRODUCTION

Drug utilization is defined as “the prescribing, dispensing, administering, and ingesting of drugs”.<sup>1,2</sup> The World Health Organization (WHO) expands on this definition by including outcome variables in their definition.<sup>3</sup> Drug utilization is defined by the WHO as the “marketing, distribution, prescription, and use of drugs in society, with special emphasis on the resulting medical, social, and economic consequences.”<sup>2</sup> A drug utilization study is therefore a study designed to describe – quantitatively and qualitatively – the population of users of a given drug (or class of drugs) and/ or the conditions of use (for example, indications, duration of treatment, dosage, previous or associated treatments and compliance).<sup>2</sup> A drug utilization study is therefore a study

designed to describe-quantitatively and qualitatively-the population of users of a given drug (or class of drugs) and/or the conditions of use (for example, indications, duration of treatment, dosage, previous or associated treatments and compliance).<sup>4</sup>

A retrospective drug utilization study is an approved, systematic process that captures, reviews, analyses, and interprets aggregate medication use data within specific health care environments.<sup>5</sup> There are more effective drugs (medicines) today on the market than ever before. Patients are better educated, have greater expectations from health care, and frequently use multiple sources of health care. Yet, drugs are frequently not used to their full potential or according to the generally accepted criteria. All prescribing is not necessarily based on patient needs

and all patient needs are not necessarily met with drug therapy. Consequently, there is as much concern about inappropriate and expensive prescribing, as about under-prescribing. The development of drug utilization as a research area made it possible to study drug prescribing and drug usage in a scientific and formal manner. The specific health care environment influences retrospective drug utilization because the quality and quantity of the data determine the scope, nature, and application of the review. These studies have little impact on immediate patient care but rather serve to identify trends in prescribing practices that may lead to interventions aimed at enhancing prescribing behaviour.<sup>6</sup> The focus of drug utilization activities has gone along different avenues on opposite sides of the Atlantic Ocean. In North America, drug utilization studies usually started at the individual patient level whether in hospital or in an ambulatory care setting. Drug Regimen Review (DRR) and Drug Utilization Review (DUR) systems use as their focus the single patient or the individual prescriber, depending on the purpose of the study. DRR is used to assure that the optimal therapy is selected for a patient, for example in the most efficacious dosage form and schedule. It also considers the health status of the patient, concurrent pathological features, therapy, and other considerations such as allergies, choice of dosage form and compliance factors. DUR is used for similar purposes, but the emphasis is different. DUR can also be used as a quality assurance tool to examine the prescribing characteristics of different medical practitioners. DUR thus makes it possible to identify, for example, high-cost prescribers or those using an extraordinary quantity or proportion of certain products. Any deviations can then be further studied and evaluated.

### Study Objectives

To observe the most commonly prescribed drugs in OPD of otorhinolaryngology department.

To evaluate the regimen commonly followed for combination therapy.

## METHODS

### Study Design

Observation drug utilization study.

### Study Place

The study was conducted at A.C.S. Medical College and Hospital, Velappanchavadi, Chennai. The medical centre is a tertiary care centre with facility that provides the trainee the opportunity to acquire knowledge and skills from the eminent doctors in the country. The study was conducted in outpatient Department of Otorhinolaryngology.

### Inclusion Criteria

All the OPD patients who are treated for Ear, Nose and Throat infections.

Age group 18- 65 years.

### Exclusion Criteria

In patients who are treated for ear, nose and throat infections:

Age less than 18 yrs and above 65 years.

Diabetic, hypertensive, hyperlipidemic and malignancy patients.

Patients with history of drug allergy and hypersensitivity reaction.

### Mode of Analysis

Age distribution

Sex ratio

Prescription percentage of each drug class

Prescription pattern of combinational drugs

Drug utilization pattern in each type of infection

Percentage consumption of supplementary drugs

The Outpatient particulars were collected from the departments of ENT department & Medical Record Department.

## RESULTS

The total number who attended the OPD was 10,249 which include 6,956 new cases and 3313 old cases. In this, the age group commonly affected were 31 to 50 years. This accounts for 34% than the extremes of the age group.

**Table 1: Age distribution.**

Age (Years)	Percentage
18 - 30	47%
31 - 50	34%
51 - 65	19%

In this study, the sex ratio, the male-female ratio is 65:35. Among the new cases, female were 2434 and male were 4521. The numbers of patients in old cases were 3313. The female patients were 1159 and male were 2153.

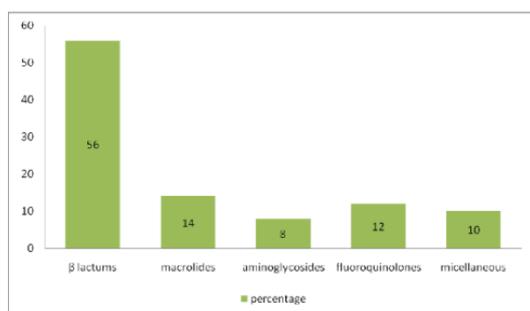
**Table 2: Sex distribution.**

Sex	Percentage
Male	65 %
Female	35 %

In this study, the most common antibacterials were  $\beta$ -lactams (56%), followed by macrolides (14%), fluoroquinolones (12%), and miscellaneous antibiotics (10%). Macrolides were given for the patients who were hypersensitive to beta- lactam antibiotics. In our study the most common  $\beta$  lactams were amoxicillin combination rather than cefixime combination which is contradictory to the study conducted by Farhan Ahmad Khan et al which shows  $\beta$ - lactams (cefixime) was most commonly prescribed antibiotic. The reason for prescribing the third generation cephalosporin was the preponderant mixed group of infections.<sup>10</sup>

**Table 3: Prescription pattern of each drug (in percentage).**

Antibiotics Prescribed	Percentage
$\beta$ Lactam Antibiotics	56%
Aminoglycosides	8%
Fluoroquinolones	12%
Macrolide Antibiotics	14%
Miscellaneous Antibiotics	10%
<b>Supplementary Drugs</b>	
Antihistaminics & Mucolytics	27 %
Analgesics	33 %
Anti Ulcer Drugs	36 %
Herbal Medicines	4 %



**Figure 1: Most commonly used antibiotics.**

Among  $\beta$ - lactams, patients mostly received the combinational drugs amoxicillin + clavulanic acid (27%), amoxicillin + cloxacillin (23%) and cefixime + clavulanic acid (19%). A similar study reported that  $\beta$ - 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.<sup>9</sup>

**Table 4: Prescription pattern of combination drugs (in percentage).**

Combination of Drugs	Percentage
Amoxycillin + Clavulanic Acid	27%
Amoxycillin + Cloxacillin	23%
Amoxycillin + Gentamycin	15%
Cefixime + Clavulanic Acid	19%
Amoxycillin + Metronidazole	9%
Ofloxacin + Antifungal + Steroid (Topical Use)	7%

From our study, the most common ear infection was CSOM (Chronic Suppurative Otitis Media). Drug consumption percentage was highest among ear infection, followed by throat infection and nose infection. This is similar to one such study conducted by Yadav et al showing higher incidence of ear infection (50.8%), followed by throat (31.37%) and least were nose (26.47%).<sup>8</sup>

**Table 5: Type of infection and the antimicrobials prescribed.**

Type of Infection	Class	Total Number Prescribed	Percentage
<b>Ear</b>	$\beta$ Lactams	3478	59%
	Aminoglycosides	580	9.9%
	Quinolones	734	12.5%
	Macrolides	682	11.6%
	Metronidazole	243	4.15%
	Antifungals	135	2.3%
<b>Nose</b>	$\beta$ Lactams	1280	68%
	Aminoglycosides	85	4.2%
	Quinolones	121	6.05%
	Macrolides	290	14%
	Doxycycline	93	4.65%
	<b>Throat</b>	$\beta$ Lactams	2591
	Aminoglycosides	423	8.3%
	Quinolones	791	15.5%
	Macrolides	942	18.4%
	Nitroimidazole	511	10.1%

**Table 6: Supplementary drugs used.**

Type of Drug	Drug Name	Total No Prescribed	Percentage
<b>Analgesics</b>	Ibuprofen	942	33%
	Aceclofenac	906	
<b>Antipyretics</b>	Paracetamol	1248	33%
		3096	
<b>Anti-Histamines</b>	Cetirizine	873	27%
	Levocetirizine	408	
	Chlorpheniramine Maleate	231	
		1512	
<b>Mucolytics</b>	Ambrolite	1008	18%
<b>Anti-Ulcer Drugs</b>	Pantoprazole	1388	36%
	Ranitidine	628	
		2016	
<b>Steroids</b>	Prednisolone	224	4%
<b>Nasal Decongestants</b>	Xylometazoline	236	8%
	Oxymetazoline	213	
		449	
<b>Herbal Medicines</b>	Septilin (Himalayas)	78	2.3%
	Ginkgo Biloba	62	
		130	

The supplementary drugs were given along with the antibiotics to produce the symptomatic relief. In this the antipyretics and analgesics account for 33%, anti histamines 27%, mucolytics 18%, anti ulcer drugs 36% and with the minimal use of steroids, nasal decongestants and herbal medicines for 4%, 8%, and 2.3% respectively.

## DISCUSSION

The drug utilization study regarding the prescription of anti bacterial agents had been in the out patient department (OPD) of otorhinolaryngology which shows wide use of antibiotics. In this study, the sex ratio, the male-female ratio is 65:35. Male patients were found to be higher as they easily approach the physician. But certain studies show that females are more sensitive to ENT infections than males the reason might be their exposure to kitchen smoke.<sup>7</sup>

The age group commonly affected were 31 to 50 years. This would probably be this age group more ambulatory and occupational workers who come to the clinic to meet their health care needs.

The most common ear infection was CSOM (chronic suppurative otitis media). Most of the patients belong to the low socioeconomic status which attributes to the indication of reduced health care delivery system. Among the nose infection, chronic sinusitis, allergic rhinitis. Perennial rhinitis predominated. In the throat infection, bacterial pharyngitis was common. Drug consumption percentage was highest among ear infection, followed by throat infection and nose infection. This is similar to one such study conducted by Yadav et al showing higher

incidence of ear infection (50.8%), followed by throat (31.37%) and least were nose (26.47%).<sup>8</sup>

In this study, the most common antibiotics were  $\beta$  lactam antibiotics. Amoxicillin seems to be the common among them. Macrolides were given for the patients who were hypersensitive to beta- lactam antibiotics. In our study the most common  $\beta$  lactams were amoxicillin combination rather than cefixime combination which is contradictory to the study conducted by Farhan Ahmad Khan et al which shows  $\beta$ - lactams (cefixime) was most commonly prescribed antibiotic. The reason for prescribing the third generation cephalosporin was the preponderant mixed group of infections.<sup>10</sup>

An antibiotic, antifungal and steroid combination is given in active stage of CSOM. Here the steroid given effectively reduces inflammation, granulation and mucosal edema. The anti fungals are added to prevent subsequent secondary otomycosis due to steroids. Apart from throat infection, erythromycin is being used in the treatment of aphthous ulcer. Triamcinolone paste is also applied for aphthous ulcer. Levofloxacin is sometimes prescribed to refractory chronic sinusitis.

The concomitant drugs given were proton pump inhibitors and H2 blockers to prevent the gastro oesophageal reflux and drug induced gastritis. The drugs given were pantoprazole and ranitidine. Anti- pyretics like paracetamol was given to reduce the fever associated with most of the throat infection. It was given for its mild analgesic property. This would also avoid gastritis associated with analgesics. Analgesics were given for severe throat infection associated with pain, acute

sinusitis and otitis externa. The most commonly prescribed analgesics were aceclofenac and ibuprofen. The gastritis induced by analgesics were treated with anti ulcer drugs. Nasal decongestants and anti histamines symptomatically relieved the nasal congestion in case of rhinitis. Mucolytics were given in sinusitis, in combination with anti- histamines, also in case of acute otitis media, or sudden barotraumas to avoid the congestion. The herbal medicines like septilin, a Himalayan product was given for chronic tonsillitis in children. Ginkgo biloba is given for acute hearing loss associated with tinnitus. B complex tablets were given to patients who were on chronic treatment and in the treatment of aphthous ulcer. Probiotics like lactobacillus are supplemented to prevent superinfection and the regain of normal bacterial flora.

Most of the patients were prescribed antibiotics based on presumptive diagnosis and clinical skills. All the patients were prescribed branded drugs. None of them received the generic drug. Prescription made by generic drug may reduce the overall drug expenditure. The average number of drugs used in each prescription was 3.20. Thus each prescription contains an antibiotic, antiulcer drug, an antihistamine/ analgesics on an average. Hence, physicians should preferably keep the mean number of drugs per prescription as low as possible as higher figures always lead to increased risk of drug interaction, development of bacterial resistance and increased cost.<sup>11</sup> The mean cost per prescription per day for OPD patients was 37 Indian Rupees.

But with so many limitations our study has shown the way of essential drug concept and rational use of drugs. Use of brand name drugs focus on cost benefit analysis also as most of the trade name drugs show better effectiveness as they provide better availability and good patient's compliance.

## CONCLUSION

Our study mainly focuses on drug utilization and the prescription pattern done in the Otorhinolaryngology department at our hospital. It mainly focused on the percentage of antibacterials of each class prescribed, the combinations of antibiotics prescribed, the antibiotics prescribed for each type of organ infection. In future we like to motivate doctors to adapt cost effective and cost

benefit way of essential drug prescription. We also like to focus on rational drug use and motivate them to prescribe the generic drugs too.

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