

**TRENDS OF ANTIMICROBIAL PRESCRIPTION IN DEPARTMENT OF
OTORHINOLARYNGOLOGY IN A TERTIARY CARE TEACHING HOSPITAL**

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Abstract

Background: The principal aim of drug utilization studies is to facilitate rational use of drugs in populations. The drug utilization studies also relates to the effects of drug use, beneficial or adverse. Inappropriate drug use may also lead to increased effects and patient mortality. The ENT diseases resistant to current antibiotics include chronic middle ear infections, chronic sinus diseases, and recurrent pharyngo-tonsillitis.

Aim: To assess the drug prescription pattern and utilization trends of antimicrobials in the department of ENT in a tertiary care hospital.

Materials and methods: An observational study was conducted between Jan 2014 –April 2014 at the ENT outpatient department in Vinayaka Missions Medical College Hospital, Salem. All the OPD patients during that period who are treated for Ear, Nose and Throat infections in the age group 5 – 65 years were included in the study. Totally 265 patients were enrolled in the study group.

Results: Male female ratio was 162:103. Majority of the study population were in the age group of between 21 – 40 years and the mean age was 32.3 years. Among all the cases ear cases were more common (46%) compared to the nose (27%) and throat (27%) cases. Among the ear diseases the commonest was CSOM (50.4%) and among the nose diseases it was sinusitis (63.4%). Tonsillitis (53.9%) and pharyngitis (33.3%) were the commonest throat diseases. For all the ENT infections the commonest antibiotic prescribed was betalactams followed by aminoglycosides and fluoroquinolones. Macrolide antibiotics were used sparingly for treating ENT infections. All the antimicrobials used were given orally and all were treated as monotherapy rather than combination of drugs.

Conclusion: An antibiotic policy has to be developed for the doctors in treating the infections so that rationality in using the antimicrobials will be developed and the occurrence of antibiotic resistance can be reduced.

Keywords: Prescription, Antimicrobial, Patient care, Hospital

Introduction:

Drug utilization research was defined by World Health Organization (WHO) in 1977 as “the marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences”¹ The principal aim of drug utilization studies is to facilitate rational use of drugs in populations. The drug utilization studies also relate to the effects of drug use, beneficial or adverse². Inappropriate drug use may also lead to increased effects and patient mortality³.

Infections stand the most important cause of disease, with upper respiratory tract infections (URTIs) causing hearing loss especially in children. The World Health Organization found out that respiratory infections generated 94.6 disability adjusted life years lost worldwide and was found to be the fourth major cause of mortality, causing death of 4 million or 6.9% of global number of deaths in 2002 according to the World Health Organisation⁴. The most common cause of acute URTIs are due to viruses and does not need antimicrobial agent unless it is indicated in conditions like acute otitis media (AOM) with effusion, sinusitis, tonsillitis and lower respiratory tract infection. Some of the ENT diseases resistant to current antibiotics include chronic middle ear infections, chronic sinus diseases, and recurrent pharyngo-tonsillitis⁵. Antibiotics were prescribed with a presumed viral etiology for cases such as rhinopharyngitis and acute bronchitis. In about 40% of all consultations for rhinopharyngitis and in 80% cases of acute bronchitis antibiotics were prescribed relatively. Irrespective of the age of the patient antibiotics were prescribed for all cases of pharyngitis⁶. The variability in antibiotic prescription depends upon the infecting organisms and antimicrobial susceptibility that usually differs from country to country, or even from region to region, but other factors which are involved

are physician preference, cost, local policy and lack of local guidelines⁷.

The problem of overuse of antimicrobials is a global phenomenon. In India, the prevalence of use of antimicrobials varies from 24% to 67%. According to a recent study, acute respiratory infections are the reason for 75% of the antibiotic prescriptions each year and are the most frequent reason for seeking medical attention. This occurs despite the fact that in most cases of URIs, antibiotics confer little or no benefit⁸. The most prominent unanswered question is how antibiotics should be administered clinically to reduce resistance development without affecting safety and efficacy. Therefore, it is essential to evaluate and monitor the drug utilization patterns from time to time, to enable suitable alterations in prescribing patterns to increase the therapeutic benefit and to reduce the adverse effects. So with this background the current study was undertaken to assess the drug prescription pattern and utilization trends of antimicrobials in the department of ENT in a tertiary care hospital.

Materials and methods:

An observational study was conducted between Jan 2014 –April 2014 at the ENT outpatient department in Vinayaka Missions Medical College Hospital, Salem. All the OPD patients during that period who are treated for Ear, Nose and Throat infections in the age group 5 – 65 years were included in the study. Totally 265 patients were enrolled in the study group. Diabetic, hypertensive, hyperlipidemic and malignancy patients and patients with history of drug allergy and hypersensitivity were excluded from the study. The major parameters included in this study consists of gender distribution, average age range of patients, different types of infections, types of antibacterial which are prescribed, most commonly used agents of a particular class, average number of antibacterial per prescription, comparison of antibacterial prescribed in monotherapy versus

combination therapy, mode of administration, comparison of antibacterial prescribed by generic versus brand name, concomitant diseased conditions, compliance or adherence (using weekly diary cards).

Results:

Table 1 shows the age and sex wise distribution of the study population. Male female ratio was 162:103; males were comparatively more than the females. Majority of the study population were in the age group of between 21 – 40 years and the mean age was 32.3 years.

Fig 1 shows the distribution of various types of cases treated in the ENT OPD, among all the cases the ear cases were more common(46%), whereas the nose and throat cases were almost of equal numbers (27%).

Table 2 shows the distribution of various ENT diseases among the study population. Among the ear diseases the commonest was CSOM (50.4%) followed by ASOM (27.1%) and otitis externa (14%). Among the nose diseases the commonest was sinusitis (63.4%) and allergic rhinosinusitis (36.5%) Tonsillitis (53.9%) and pharyngitis (33.3%) were the commonest throat diseases among the study population. Few of the cases presented with combined ENT problems like pharyngitis with CSOM (37.5%) and phayngitis with ASOM (28.1%).

Table 3 shows the various antimicrobials used for the various ENT diseases among the study population. For the ear infections the commonest antibiotic prescribed was betalactams followed by aminoglycosides and fluroquinolones. Macrolide antibiotics were used sparingly for treating ear infections. The similar type of antibiotic prescription was seen for treating the nose, throat and also combined infections. Betalactams was commonly used for treating most of the ENT infections. All the antimicrobials used were only by oral route and all were treated as monotherapy rather than combination of drugs.

Discussions:

The drug utilization study regarding the prescription of anti bacterial agents had been in the outpatient department (OPD) of otorhinolaryngology which shows wide use of antibiotics. In this study, the sex ratio, the male-female ratio is 162:103. 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^{9, 10}. The age group commonly affected was 21 to 40 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 rhinosinusitis 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%)¹¹.

In this study, the most common antibiotics were β 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 β lactams were amoxicillin combination rather than cefixime combination which is contradictory to the study conducted by Farhan Ahmad Khan et al which shows β -lactams (cefixime) was most commonly prescribed antibiotic¹². Upper respiratory tract infections are among the leading cause of acute morbidity and most frequent cause of health service access worldwide. A study

by Kameel M et al in the year of 2005 showed that amoxicillin (70.3%) was the most frequent antibiotic prescribed. Erythromycin (10.4%), amoxicillin+clavulanic acid (9.1%) and cefixime (8.0%) were the other antibiotics used¹³.

In our study, betalactams (amoxicillin, amoxicillin + clavulanic acid) was the commonly prescribed antibiotic which was followed by aminoglycosides and fluoroquinolones. Despite the paucity of supporting evidences, the use of antibiotics in the management of URTI remains a persistent and worrying trend worldwide. In the absence of use of culture and sensitivity of the secretions and throat swab, indispensable usage of antibiotics had led to increase in drug resistance organisms^{14, 15}. Prescribing an antibiotic for URTIs is a common practice in the medical profession and any upper respiratory tract complaint result in an antibiotic being prescribed in 65% of the consultations, particularly for pharyngitis. We found that at our tertiary hospital amoxicillin was the commonly used drug in URTI in all age groups.

Reasons for this trend could be as follows: 1. Organisms susceptible for amoxicillin in this area, 2. Oral bioavailability for amoxicillin is good; 3. Food interaction is minimal, 4. Cheaper and 5. Patient compliance is good. In our antimicrobial utilization study, drugs were prescribed using brand names and not generic names. The main difference between these two is the cost. The generic drug is cheaper than branded drug. Hence to increase patients' accessibility, generic drugs should be prescribed.

This study had some limitations. The results of this study might have been affected by the following factors: 1. Short data collection period (3 months), 2. Small sample size, 3. Seasonal variation which can affect the severity of URTI's. 4. Lack of information about definite bacterial etiology and also prevalent organisms. Furthermore this study

did not explore the adverse effects of drugs prescribed

Conclusions:

Our study mainly focuses on antimicrobial 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. An antibiotic policy has to be developed for the doctors in treating the infections so that rationality in using the antimicrobials will be developed and the occurrence of antibiotic resistance can be reduced. 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.

References:

1. WHO Expert Committee. The Selection of Essential Drugs, Geneva: World Health Organization. Technical Report Series. 1977 p. 615
2. Lunde PK, Baksaas I. Epidemiology of drug utilization basic concepts and methodology. Acta. Med. Scand. Suppl. 1988 721: 7-11.
3. Einarson T. Pharmcoepidemiology. In: Parthasarathi G, Hansen KN, Nahata MC, editors. A Text book of Clinical Pharmacy Practice essential concepts and skills. 1st ed., Hyderabad: Universities Press (India) Limited; 2008 pp. 405-423.
4. Chronic Suppurative Otitis Media : Burden of illness and management options . World Health Organization . Geneva, Switzerland. Monograph. 2004 PP 13 – 22 .
5. Laporte JR, Porta M, Capella D . Drug utilization studies: A tool for determining the effectiveness of drug use. Br. J. Clin. Pharmacol. 1983 16: 301-304.

6. Grace NN, Bussmann RW . Traditional management of ear, nose and throat (ENT) diseases in Central Kenya. *J. Ethnobiol. Ethnomed.* 2006 2: 54.
7. Anon JB. Acute bacterial rhinosinusitis in pediatric medicine: current issues in diagnosis and management. *Pediatr Drugs.* 2003;5:25–33.
8. Jain N, Lodha R, Kabra SK . Upper respiratory tract infections. *Indian J. Pediatr.* 2001. 68: 1135-1138.
9. Erwin WG. The Definition of Drug Utilization Review: Statement of Issues. *Clin Pharmacol Ther* 1991;50(5 Pt 2):596-9.
10. Truter I. A review of drug utilization studies and methodologies. *Jordan J Pharmaceutical Sci* 2008;1:91-104.
11. Yadav P, Kanase V, Lacchiramka P, Jain S. Drug utilization trends in ENT out patient department in a teaching hospital. *Int J Pharma Bio Sci* 2010;1:153-
12. Khan FA. Patterns of prescription of antimicrobial agents in the Department of Otorhinolaryngology in a tertiary care teaching hospital. *African J Pharmacy Pharmacol* 2011;5:1732-8.
13. Mungrue K, Brown T, Hayes I, Ramroop S, Thurston P, Pinto Pereira L. Drugs in upper respiratory tract infections in paediatric patients in North Trinidad. *Pharmacy Practice* 2009;7(1):29-33.
14. S. A. Sridevi, T. Janagan, P. Rathnasamy, R. Rajarajeswari. Drug utilization study in the otorhinolaryngology department in a tertiary care hospital. *International Journal of Basic & Clinical Pharmacology.* 2013 Vol 2(3) pp 306-310.
15. K.Ramachandra, Narendranath Sanji, H.S. Somashekar, Abhishek Acharya, Keerthi Sagar J, Susheela Somappa Halemani. Trends in prescribing antimicrobials in an ENT outpatient department of a tertiary care hospital for upper respiratory tract infections. *International Journal of Pharmacology and Clinical Sciences.* 2012 Vol 1 (1) . pp 16-19

Table : 1 Age and sex wise distribution of the study population

AGE GROUP	MALES	FEMALES	TOTAL
1-10 yrs	3 (1.8%)	6 (5.8%)	9 (3.3%)
11-20 yrs	10 (6.1%)	9 (8.7%)	19 (7.1%)
21-30 yrs	59 (36.4%)	44 (42.7%)	103 (38.8%)
31-40 yrs	48 (29.6%)	17 (16.5%)	65 (24.5%)
41-50 yrs	23 (14.1%)	16 (15.5%)	39 (14.7%)
51-60 yrs	19 (11.7%)	9 (8.7%)	28 (10.5%)
>60 yrs	0	2 (1.9%)	2 (0.75%)
Total	162 (100%)	103 (100%)	265 (100%)

Fig 1 : Distribution of various types of cases treated in ENT OPD

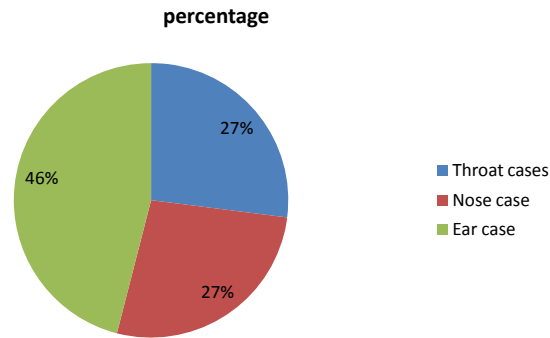


Table 2 : Distribution of various ENT diseases among the study population

ENT	Name of disease	Number	Percentage
Ear disease (n=107)	CSOM	54	50.4
	ASOM	29	27.1
	Otitis externa	15	14
	Otomycosis	3	2.8
	Secretory Otitis media	2	1.8
	Acute otitis media	4	3.7
Nose disease (n = 63)	Sinusitis	40	63.4
	Allergic rhinosinusitis	23	36.5
Throat diseases (n= 63)	Tonsillitis	34	53.9
	Pharyngitis	21	33.3
	Laryngitis	8	12.6
Combined (n = 32)	Pharyngitis + ASOM	12	37.5
	Pharyngitis + CSOM	9	28.1
	Pharyngitis + Otomycosis	4	12.5
	Sinusitis + Pharyngotonsillitis	7	21.8

Table 3 : Type of infection and the antimicrobial prescribed

Type of infection	Antimicrobial prescribed	Number	Percentage
Ear (n=107)	Beta Lactams	93	86.9
	Cephalosporins	4	3.7
	Fluroquinolones	7	6.5
	Aminoglycosides	15	14
	Macrolides	2	1.8
Nose (n=63)	Beta Lactams	50	79.3
	Cephalosporins	5	7.9
	Fluroquinolones	5	7.9
	Aminoglycosides	9	14.2
	Macrolides	2	3.1
Throat (n=63)	Beta Lactams	48	76.1
	Cephalosporins	4	6.3
	Fluroquinolones	6	9.5
	Aminoglycosides	10	15.8
	Macrolides	3	4.7
Combined (n=32)	Beta Lactams	23	71.8
	Cephalosporins	3	9.3
	Fluroquinolones	4	12.5
	Aminoglycosides	5	15.6
	Macrolides	4	12.5