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STUDY OF DRUG PRESCRIPTION PATTERNS IN ENT OUTPATIENTDEPARTMENT IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Aims and objectives: The purpose of the study was to analyse drug prescription patterns inout-patient department of ENT (Ear, Nose and Throat) in a tertiary care hospital in Goa. **Materials and methods**: A total of 600 prescriptions were assessed in this prospective cross sectional observational study over a period of 13 months in Goa Medical College, Goa. The collected data was analysed using MS Excel and expressed in form of percentages. **Results**: Among the 600 prescriptions, 65% patients were females and 35% were females.Majority of the patients were from the age group of 30-39 years. Ear diseases were most common (39%), followed by the throat (17.3%) and the nose (10.6%). On an average 5.9 drugs were given per prescription. Out of 3591 drugs maximum (725) belonged to antimicrobial class. 164 drugs out of 1872 formulations were prescribed in generic names. **Conclusion**: Studying drug prescription patterns as well as conducting drug utilization studies would help in rational use of drugs and facilitate appropriate patient care.

KEYWORDS: Prescription, Polypharmacy, Essential drug lists, WHO INRUD indicators.

INTRODUCTION

Diseases of ear, nose and throat (ENT) commonly affect the general population.[1] Adults as well as the younger population are affected, often with impairment of the daily life of affected individual[2] leading to serious consequences which include hearing loss and also lower quality of life which might put emotional strain on the life of the patient.[3]

With the increase in global population, infections remain the most important causes of disease, with upper respiratory tract infections (URTIs) causing hearing loss especially in children. The World Health Organization (WHO 2004) estimated that respiratory infections caused 94.6 disability adjusted life years lost worldwide and were the fourth major cause of mortality, responsible for 4 million deaths in 2002.[4]

WHO defines rational use of medicines as "patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period oftime and at the lowest cost to them and their community (WHO, 1985).[5] In simplest words, rational use is "prescribing right drug, in adequate dose for the sufficient duration & appropriate to the clinical needs of the patient at lowest cost." The concept of rational drug use is age old, proven by the statement made by the Alexandrian physician Herophilus 300. B.C that is "Medicines are nothing in themselves but are the very hands of god if employed with reason & prudence."[6]

Excessive and inappropriate use of antibiotics is currently and has been a major contributor to the emerging problem of rising antibiotic resistance. Irrational use of drugs leads to increased treatment failure incidence rate along with drug resistance and financial burden on the patients and the whole general community.[7]

Drug utilization studies systematically review the drug prescribing habits by virtue of its design and help provide necessary feedback to the clinicians, develop protocols which aid in describing optimal drug use, and promote appropriate drug use by educating the patients regarding the same.[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. INRUD developed various indicators in collaboration with WHO which provided objective indices to allow for assessment of practices of drug use.[9] There are two indicators defined. Core indicators and complementary indicators. Core indicators include prescribing indicators, patient care indicators, and facility indicators. The complementary indicators are quite difficult to measure and collection of

data for these is not much reliable as it is less standardized since local variables factor in.[10] The various studies on the process of drug utilization focus mainly on the factors related to prescribing, dispensing, administering and consumption of medication. They cover the medical and non-medical determinants of drug utilization.[11]

From time to time, it is important to monitor and evaluate the drug utilization patterns, so that suitable alterations can be introduced in the prescribing patterns to raise the therapeutic benefits and to reduce adverse effects of the drugs.[12] Hence, the present prospective study was aimed to evaluate drug prescription patterns in ENT outpatient department of Goa Medical College.

MATERIALS AND METHODS

The current study was conducted in Out Patient Department of ENT in Goa Medical Collegeand Hospital after acquiring permission Institutional Ethics Committee.

A proforma was designed to collect the demographic details of the patients like age, sex, diagnosis and the treatment given were noted. The following WHO INRUD prescribing indicators were assessed in each prescription

- Average number of drugs per encounter.
- Percentage of drugs prescribed by generic name.
- Percentage of encounters with an antibiotic prescribed.
- Percentage of encounter with an injection prescribed.
- Percentage of drugs prescribed from essential drug list or formulary.[10]

(In this study both WHO Essential Drug List (2019) and National List of EssentialMedicines (2015) was used).

A total number of 600 prescriptions were collected during the study period of Jan 2018 to Feb 2019 by attending OPD twice a week by an independent observer with no participation in prescribing decisions. The study sought out the patients visiting the OPD only of which first time visits and newly diagnosed patients were included.

The data was analysed using Microsoft Excel 2016 and is presented in mean and percentages and as graphs and charts wherever possible.

RESULTS

The study was conducted from January 2018 to February 2019. A total of 600 participants were obtained and analysed in this study.

Prescription analysis- All the prescriptions had the correct patient data, except 4 prescriptions which didn't mention age and 3 prescriptions which did not bear the hospital number. The prescriptions were legible. Date was mentioned. The prescriptions had names of the drugs, strength and dosage forms correctly mentioned. All the prescriptions had prescriber's signature, registration number and designation.

Sex and age distribution- Female patients (391) were more than the male patients (209). Table 1 shows that majority of the patients were from age group 30-39 years. Least number of patients were from age group 80-89 years. The age of the patients ranged from 1 month to 89 years. Average age of the patient visiting the ENT OPD was 34.3 years.

Table 1: Age distribution Compared to Sex distribution.

Age range(years)	Male	Female	Total
0-9	28	47	75
10-19	27	49	76
20-29	36	57	93
30-39	31	80	111
40-49	32	69	101
50-59	25	55	80
60-69	25	24	49
70-79	3	9	12
80-89	2	1	3

Disease distribution- The most common type of infection was seen in ear (39%), followed by throat (17.3%) and nose (10.6%). Among the ear infections, most common primary diagnosis was chronic suppurative otitis media (69), followed by ear wax (37) and ear discharge (25). In nose infections, most common was rhinosinusitis (21), followed by allergic rhinitis (16). Among throat infections, most common was laryngopharyngeal reflux (45), followed by malignancy (16) and pharyngitis (13).

Number of prescriptions according to number of drugs- Total number of 3591 drugs were prescribed. Average number of 5.9 drugs were given per prescription. Table 2 shows number of drugs prescribed and their frequency.

Table 2: Number of drugs prescribed and their frequency.

No of drugs per prescription	No of prescriptions
1	55
2	47
3	60
4	97
5	64
6	42
7	49
8	44
9	46
10	28
11	17

12	15
13	15
14	8
15	7
16	1
17	2
18	1
19	1
21	1
Total	600

Drugs prescribed in generic name- 164 drugs out of 1872 formulations were prescribed in generic name with a total percentage of 8.7% of total formulations prescribed. The following 5 drugs were prescribed the greatest number of times in generic name; tablet vitamin C (31), tablet calcium (15), sodium chloride drops (15), mupirocin ointment (12) and tablet pregabalin (10).

Major therapeutic drug classes- 3591 drugs were prescribed belonging to various classes. Maximum drugs belonged to antimicrobial class (725) followed by autocoids and related drugs (708), miscellaneous drugs (those drugs which did not belong to the standard classes) (455). The following table summarises the assessment.

Table 3: Major drug classes.

Drug Classes	Numberof drugs	Percentage
Antimicrobials	725	20.1%
Drugs affecting GIT	301	8.3%
Calcium channel blockers	3	0.08%
Anti-cancer drugs	1	0.02%
Antiseptics/ disinfectants	93	2.5%
Hormones and related drugs	252	7.8%
Autocoids and related drugs	709	19.7%
Adrenergic system drugs	308	8.5%
Drugs affecting the respiratorysystem	145	4%
Opioid analgesics	7	0.2 %
Drugs affecting CNS	82	2.2%
Drugs affecting PNS	166	4.6%
Vitamins and minerals	312	8.6%
Miscellaneous drugs	455	12.6%
Total	3591	

Encounter with antimicrobials

Fig.1 shows that among the antimicrobial class of drugs, Antibacterial drugs were prescribedhighest.

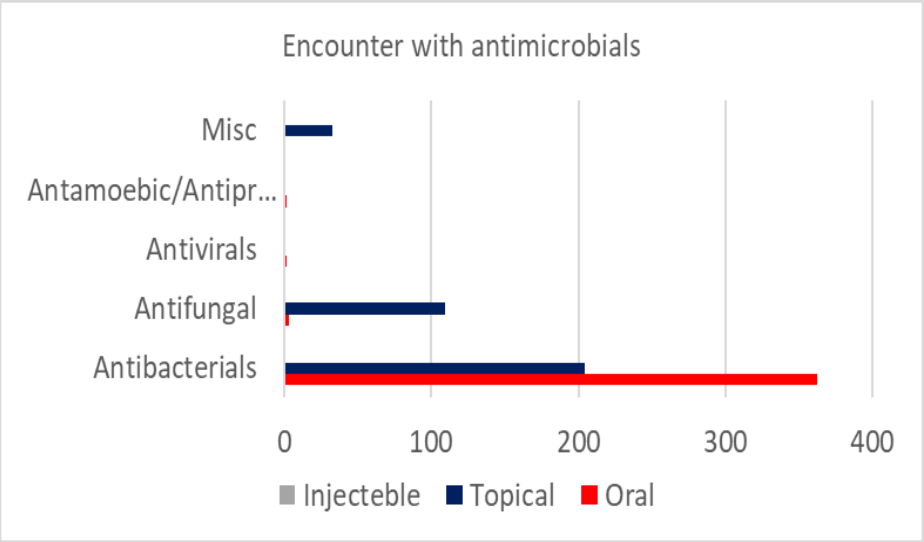

Fig.1: Encounter with antimicrobial drugs.

Encounter with antibacterial drugs- When compared with the total number of formulations prescribed, oral antibiotic preparations (19.4%) were prescribed more than the topical (10.6%) and injectable (0.05%) preparations.

The following table 4 shows antibacterial drugs divided into their individual classes. Among the antibacterial

drugs, fluoroquinolones were the largest class to be prescribed (22.3%) followed by beta lactamase inhibitors (19.5%) and aminopenicillins (19.4%). Oxazolidinones (1.1%) were the least to be prescribed.

Table 4: Antibacterial classes.

Class of antibacterialdrugs	Total number	Percentage*
Beta lactamase inhibitors	142	19.5%
Aminopenicillins	141	19.4%
Fluoroquinolones		
• Oral	35	4.8%
• Topical	127	17.5%
Cephalosporins	24	3.3%
Macrolides	11	1.5%
Chloramphenicol (topical)	17	2.3%
Aminoglycosides		
• Topical	53	7.3%
• Injectable	1	0.1%
Oxazolidinones	4	0.5%
Nitroimidazoles	8	1.1%
Miscellaneous	41	5.6%

**As compared to total antibacterial drugs*

Routes of administration- Total 1872 formulations were prescribed. These included 1253 oral, 6 injectables and 613 topical formulations. Out of 613 topical formulations, 357 were ear or nasal drops, 176 were creams, gels or local surface applications and 80 were nasal sprays.

Drugs from essential drug lists- 1547 drugs were prescribed from WHO Model List of Essential Medicines, 2019. Compared to that, 1737 drugs were prescribed from National List of Essential Medicines, 2015.(Fig.2).

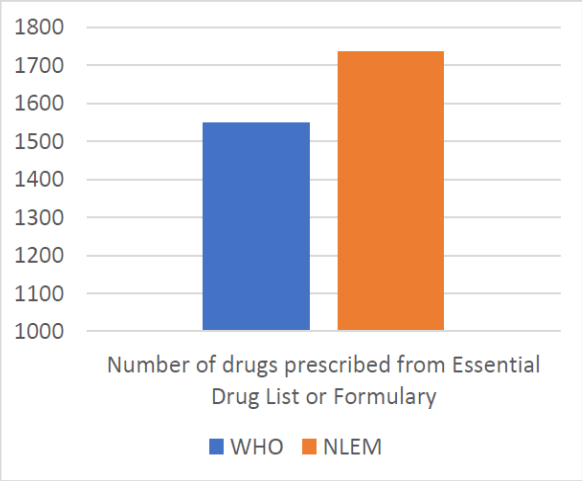

Fig.2: drugs prescribed in WHO and NLEM drug lists.

To summarise the results in relation to WHO INRUD core prescribing Indicators

Table 5: WHO INRUD indicators.

Average number of drugs per encounter	5.9
Percentage of drugs prescribed by generic name	4.6%
Percentage of encounters with an antibiotic prescribed	48.3%
Percentage of encounters with an injection prescribed	0.6%
Percentage of drugs prescribed for essential drug list or formulary	43.1% (WHO 2019) 48.4% (NLEM 2015)

DISCUSSION

The present study was a prospective, cross sectional study of the patients who reported for treatment in the Out Patient Department (OPD) of ENT in Goa Medical College.

The number of female patients were found to be more than the male patients in the current study. It was not similar to most studies such as Padwal et al,[11] Sumalatha et al,[12] Joshi et al,[13] and Kumar et al[14] where males were more than females. The maximum number of patients belonged to age group 30-39 years which was similar to the study conducted by Indulkar et al.[15] This was followed by age group 40-49 years and 20-29 years. This shows that ENT diseases are more common in young adult age groups in Goa.

In the current study the most common type of infection was seen in ear (39%), followed by throat (17.3%) and nose (10.6%). The results were similar to a study conducted by Manpreet et al in Himachal Pradesh where they noted ear diseases to be 47%, nose diseases to be

27% and throat diseases to be 26%.[16] Otological problems are known to form the major burden in this study as also shown by a study conducted by WHO.[17]

The WHO defines polypharmacy as "the administration of many drugs at the same time or the administration of an excessive number of drugs".[18] While excessive polypharmacy (EPP)is the concomitant use of nine/ten or more medicines taken regularly or as-needed.[19]

A system review conducted by Masnoon et al shows that there is large heterogeneity in the definition of polypharmacy. The most commonly used term was polypharmacy which was defined as five or more medications by 46.4% of studies. However, the clinical basis for using a numerical count such as five or more medications to define polypharmacy and the potential of this to rationalise medication use and optimise health outcomes is not elucidated in most studies.[20] When polypharmacy is defined as a count of the number of drugs, a cut-off of five or more concurrently is most frequently used.[21] In the current study for an average 5.9 drugs were prescribed per patient. 277 out of 600 prescriptions had 6-21 drugs per prescriptions. According the studies discussed above,[20,21] the present study points towards an incidence of polypharmacy in this institution. But this cannot be taken as a final result as the definition of polypharmacy is not standardised. And for this reason, an internationally standardised definition of polypharmacy is needed.

The average number of drugs per prescription from the current study was higher than othersimilar studies found in the literature.[1,12,13,14,22] The results indicate the need for a shift towards the term 'appropriate polypharmacy' by using a n approach of assessing drug use while considering comorbidities, according to best available evidence in order to optimise health outcomes.[20]

In the present study, 8.7% drugs (164) out of 1872 formulations were prescribed in generic name and 72.6% formulations (436) were prescribed with a brand name. This was a very poor result when compared to studies like Padwal et al[1], Sumalatha et al[12] and Indulkar et al[15] where 20%, 86.5% and 41.62% drugs were prescribed by generic name respectively. This forms a major concern because prescribing using generic names of the drugs is considered rational. Generic prescribing is more cost effective, associated with less potential for errors and is therefore encouraged by all prescribers.[25]

Antibiotics (20.1%) was the most commonly prescribed drug class. This almost corresponds to the studies by Sumalatha R et al[12] which had incidence of 28% and Joshi U et al[13] which had 24.4 % antibiotic drug prescription. Among antimicrobial drugs, oral antibiotics were prescribed the most (10%) followed by topical antibiotics (5.7%). When these values were compared with the study conducted by Khan et al in 2011, it was noticed that incidence of prescription of oral antibiotics was much higher than the current study (56.2%) but the incidence of prescribing topical antibiotics was lower than the current study (3.2%).[23] The duration between these two studies is approximately 7 years. The difference between the oral and topical drug prescriptions may be attributed to better knowledge about the rising antibiotic resistance among the prescribers over a period of time, hence their limited use of systemic antibiotics and more preference over the topical preparations.

Most common antibiotics prescribed were fluoroquinolones; 387 out of 567 antibiotics prescribed. Fluoroquinolones formed 10.7% of total drugs prescribed. Fluoroquinolones being the largest antibiotic drug class to be prescribed, was similar to the results obtained by Indulkar et al[15] where fluoroquinolones were most commonly prescribed (48.09%).

Fluoroquinolones have high oral bioavailability, large volume of distribution, and broad- spectrum antimicrobial activity.[24] Probably this has helped in its widespread use, which has further led to increase in the antimicrobial resistance to the fluoroquinolones.

The results show that on an average, one patient received an antibiotic, a NSAID, a gastroprotective agent, a topical corticosteroid and an antihistaminic drug. The mentioned drug classes being some of the larger drug classes in this study. This pattern indicates that the prescribers have symptomatic rather than the definitive approach toward the pharmacotherapy. If the gastroprotective agents are prescribed without valid need or history of acid–peptic disease unnecessarily, cost of treatment is raised.[1] Overprescribing of NSAIDs can give rise to the gastric mucosal erosion while corticosteroids might lead to systemic side effects.

In the current study drugs were assessed for the inclusion in two essential drug lists. One was WHO Model list of Essential Drugs last updated in June 2019 and National List of Essential Medicines (NLEM) last updated in 2015. From WHO list 43.1% drugs (1547) were prescribed and from NLEM 48.4% drugs (1737) were prescribed out of total 3585 drugs. The results obtained are less compared to studies like Kishore Kumar et al[14] where 74% drugs were prescribed from WHO essential drug list and Padwal et al[1] where 86.2% drugs were from NLEM. This can be attributed to lack of knowledge about the importance of essential drugs. The basic principle of Essential Medical Lists is efficacy, safety and cost and a prescriber should be made familiar with such.[26]

CONCLUSION

The current study focussed on prescribing patterns of the drugs in ENT outpatient department in a tertiary care hospital. Assessment of disease distribution and use of antibiotics was also done. The results revealed that practice of polypharmacy exists in this institution. This

suggests that efforts should be made to educate the prescribers about the cons of polypharmacy. This may lead to benefits like reduced drug interactions and adverse drug reactions, reduced burden of cost of the drugs on the patients and might prevent drug cascading.

Antimicrobials are the largest number of drugs to be prescribed in this study. It is also observed that on an average every patient in the study received one antibiotic. The percentageof encounters of the antibiotics prescribed is also more. This warrants for having an antibiotic prescribing policy as it will go a long way to minimize inappropriate prescriptions.

It is noticed that the habit of prescribing by generic name of the drug was quite low in thisstudy. This suggests that effort must be made to encourage prescribers for generic prescribing which may have numerous benefits including cost effectiveness since patients will be able to avail free drugs from the hospital pharmacy and this also improves compliance.

When the prescribed drugs were compared to the latest WHO Model List of Essential drugsand National List of Essential Medicines, it is seen that more than 50% drugs did not belongto those lists. This shows that prescribers must be educated about the essential drugs.

Following the standardised formulary will definitely help in increasing the efficacy and safetyof the drugs and will reduce the cost burden from the patients as well as the government.

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