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A RETROSPECTIVE STUDY ON DRUG PRESCRIBING PATTERN INRESPIRATORY TRACT INFECTION IN A TERTIARY CARE TEACHING HOSPITAL

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ABSTRACT

Background: Respiratory tract infections are major cause of morbidities and mortality particularly in patients at the extreme of age, and those with pre-existing lung disease or immune suppression. In India, acute respiratory tract infections are responsible for 1 million deaths. Out of these 10-15% is due to acute lower respiratory tract infection. Drug utilization research is the study of marketing, distribution, prescription and use of drug in a society with special emphasis on the resulting medical, social and economic consequences. **Objectives:** To evaluate the prescribing pattern given to patients admitted with respiratory tract infections in general medicine department and to assess the rationality of these prescriptions given in our hospital using WHO core drug prescribing indicators. **Methods and Methodology**: It was a retrospective study. The study period was about 6 months and the relevant data was collected from in patient records. **Result:** A total of 180 prescriptions were collected from general medicine department and analysed for demographic characteristics, disease proportion, and prescribing pattern. Males were more (55.5%) compared to females (44.4%). Majority patients belonged to age group 18-30 years (28.8%). Our most common respiratory infections found in study population were LRTI with comorbidities (57.3%) followed by common cold (11.11%). 1068 drugs were found in 180 cases among which supportive therapy (30.6%) was mostly given followed by antibiotics (23.5%). Cephalosporins were most commonly prescribed antibiotics followed by Amikacin. Most commonly prescribed dosage form were injections. **Conclusion:** Most of the drugs prescribed were included in the WHO essential drug list, India 2019. It is the responsibility of the clinical pharmacist to perform the periodical drug utilization studies in order to know the drug prescribing pattern and also to know the prevalent disease condition at particular point of time.

KEYWORDS: Prescribing pattern of respiratory tract infection, Antibiotics.

INTRODUCTION

Drug utilization research is defined by the WHO as the study of distribution, marketing, prescription, and utilization of drugs in a society, with special prominence on the resulting medical, social and economic consequences. Conducting periodic studies of pattern of drug use in a hospital setting is essential to critically analyse the current hospital drug policies and to make recommendations based on various guidelines required to improve the current drug usage pattern.[1] A respiratory tract infection (RTI) is defined as infections of the upper and lower respiratory tract.[2] Upper and lower respiratory tract infections are a major cause of morbidity and mortality particularly in geriatric patients and those with early lung disease or immune suppression.[3] Respiratory tract infections are classified into two types-Upper respiratory tract infection and lower respiratory tract infection. Infections of the upper respiratory tract include tonsillitis, pharyngitis, laryngitis, sinusitis, otitis media, certain types of influenza, and the common cold. Symptoms of URTIs can include cough, sore throat, runny nose, nasal congestion, headache, low grade fever, facial pressure and sneezing. Lower respiratory tract contaminations are more common than upper respiratory diseases. LRTIs are the main source of death among all irresistible diseases. Major LRIs are bronchitis and pneumonia. Influenza can further cause upper and lower respiratory tract infections.[4] Rhinoviruses, respiratory syncytial viruses (RSV), parainfluenza and influenza viruses, human meta pneumovirus and adenoviruses are common causative viruses for ARTI.

Among this, Rhinovirus account for 25-30% acute URTIs and coronavirus for 10%, while other viruses account for 25-35%. According to WHO, in developing countries like India, ARTI with source as RSV is responsible for almost 6 lakhs deaths per year.[5]

The prescribing pattern reflects the physician understanding of the disease process, his application and knowledge of pharmacotherapeutics. Inappropriate

prescribing has been found in many health facilities in developing countries.[6] Antibiotics are often given as first line treatment in lower respiratory tract infections; however, these may not be indicated in viral infections where antiviral therapy is required. It is necessary to use appropriate antibiotic selection based on the organism that causes infection and to ensure that therapy changes with the evolving nature of these infections and the emerging resistance to conventional therapies.[7]The analysis of prescribing pattern is a part of medical audit and helps to monitor, evaluate and also may, suggest modifications in prescribing practices to make medical care rational. Antibiotics are prescribed for either prophylactic or therapeutic reasons. Irrational prescription of antibiotics may lead to drug resistance. By considering the above facts our study will be used as a tool to assess the rational prescribing pattern in our tertiary care teaching hospital.[8]

MATERIALS AND METHOD
Study type: Retrospective Study
Study place: This study was carried out at general medicine department, MIMS, Mandya
Study period: 6 months
Sample size: 180
Sample method: Convenience sampling
Inclusion criteria: AllPatients admitted in general medical department diagnosed withrespiratory tract infection
Exclusion criteria: Pregnant women and patients below 18 years.

RESULT AND DISCUSSION
This study was conducted in general medicine unit of MIMS, Mandya. A total of 180 patients admitted in MIMS were enrolled in the study based on study criteria. The required details from the patient case sheet were recorded in a suitably designed patient profile form. The prescription data of 180 patients were analyzed in the current study.

Gender Wise Distribution
Table 1: Distribution of patients with RTIs based on gender.

Gender	No of patients	Percentage
Male	100	55.55%
Female	80	44.44%

A total of 180 patients data were collected from in-patient department of MIMS hospital General medicine unit during a period of six months. Among the whole 180 patients under study.

(Table 1) shows that 100 (55.5%) patients were maleand 80 (44.4%) patients were female. This study showed that the prevalence of respiratory tract infections were more in males than in females.
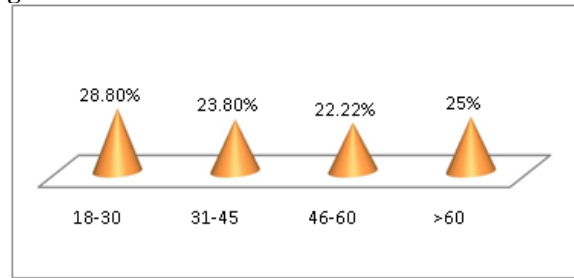
Age Wise Distribution

Fig. 1: Age wise distribution of patients with RTIs.

Out of 180 cases collected, it was found that patients aged between18-30 were more prone to respiratory tract infection compared to other ages (Fig 1).

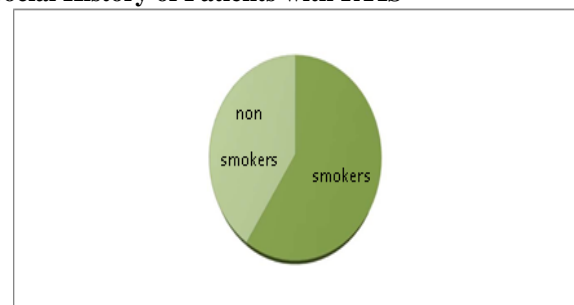### Social History of Patients with RTIS

Fig. 2: Percentage of smokers and non-smokers in patients with RTIs.

Out of 180 cases collected, it was found that 96(53%) patientswere smokers. Majority were found to be male patients aged between 20-40 years. 84(47%) patients were non-smokers(Fig 2).
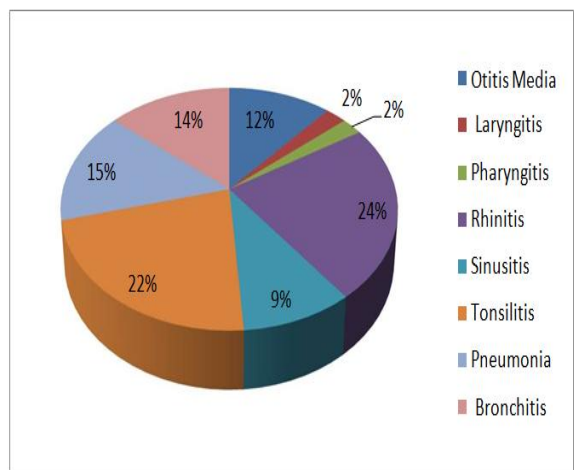
Types of RTIs

Fig. 3: Distribution of RTIs.

We had distributed the patients based on various types of RTIs which included otitis media, laryngitis, pharyngitis, rhinitis, sinusitis, tonsillitis, pneumonia and bronchitis. Out of 180 cases collected, patients were mostly affected with rhinitis (11.11%) followed by tonsillitis (10.5%),

followed by pneumonia (7.22%).From this, we concluded that LRTI is more common as compared to URTI in our hospital (Fig 3).

Distribution of Patient with Rtis Based On Comorbidities
Table 2: Distribution of Patient with RTIs Based on Comorbidities.

Disease condition	Number of patients	Percentage
P+B+HTN+DM	25	13.8%
P+TB+A+COPD+APE	25	13.8%
P+B+ANEMIA	14	7.7%
P+B+OTHERS	30	16.6%

(Table 2) shows patients with RTIs based on comorbidities which mainly includes hypertension, diabetes mellitus. Chronic obstructive pulmonary disease, anemia and others (cardiovascular disease, alcoholic liver disease, urinary tract infection, gastritis, retroviral disease)

From this study, we concluded that out of 180 cases, patients with RTIs mostly had comorbidities like cardiovascular diseases, retroviral diseases, alcoholic liver disease, urinary tract infections and gastritis.

Drug Prescribing Pattern Of Patients With Rti
Drug prescribing pattern of patients with RTIs along with their comorbidities are studied in the below section. This helps to study the prescribing pattern of antibiotics and the supportive therapy provided to patients with different types of RTI.

Table 3: Drug utilization study of pneumonia.

DRUGS		No ofdrugs	Totalno. Ofdrugs	Percentage
Antibiotics	Ceftriaxone	10	22	30.5%
	Amikacin	3		
	Azithromycin	1		
	Doxycycline	3		
	Levofloxacin	2		
	Amoxicillin+ Clavulanic acid	2		
	Piperacillin+Tazobactum	1		
Bronchodilater	Salbutamol+Ipratropium	9	16	22.2%
	Theophylline	7		
Mucolytics	Bromhexine	2	2	2.7%
Expectorant	Ambroxol+Guaifenesin	4	4	5.5%
Corticosteroid	Dexamethasone	2	2	2.7%
Miscellaneous	Antacid	10	26	36.1%
	Vitamins	2		
	NSAIDs	10		
	Anti-allergic	2		
	Anti-emetic	2		

Out of 13 single cases of pneumonia, antibiotics (30.5%) were mostly prescribed drug among which Ceftriaxone was commonly given followed by Amikacin. Supportive therapy includes paracetamol, bronchodilators (salbutamol, theophylline, bromhexine), expectorants (ambroxol, guaifenesin),corticosteroids (dexamethasone) NSAIDS (diclofenac, aceclofenac) anti emetics (ondansetron), Antacids (pantoprazole, ranitidine), vitamins (B complex), anti- allergic (cetirizine, chlorpheniramine maleate) (Table 3)

Table 4: Drug utilization study of bronchitis.

Drugs		No. of Drugs	Totalno. Ofdrugs	Percentage
Antibiotics	Ceftriaxone	10	13	18.5%
	Amikacin	1		
	Levofloxacin	2		
Bronchodilator	Salbutamol+Ipratropium bromide	6	17	24.6%
	Salbutamol	5		
	Theophylline	6		
Expectorant	Ambroxol+Guaifenesin	4	4	5.7%
Corticosteroid	Hydrocortisone	2	2	2.8%
Miscellaneous	Antacid	12	33	47.8%

Anti-protozoal	1	
Anti-emetic	4	
NSAID/Antipyretic	11	
Anti-allergic	4	
Vitamins	1	

Out of 12 single cases of bronchitis, bronchodilators (24.6%) were commonly prescribed among which salbutamol was commonly given. Antibiotics (18.5%) were prescribed among whichCeftriaxone was commonly given.Supportive therapy includes expectorants (ambroxol, guaifenesin), corticosteroids (hydrocortisone), antacid (pantoprazole, ranitidine), NSAIDs (diclofenac,aceclofenac),paracetamol, anti-allergic(chlorpheniramine maleate) and vitamins (Table 4).
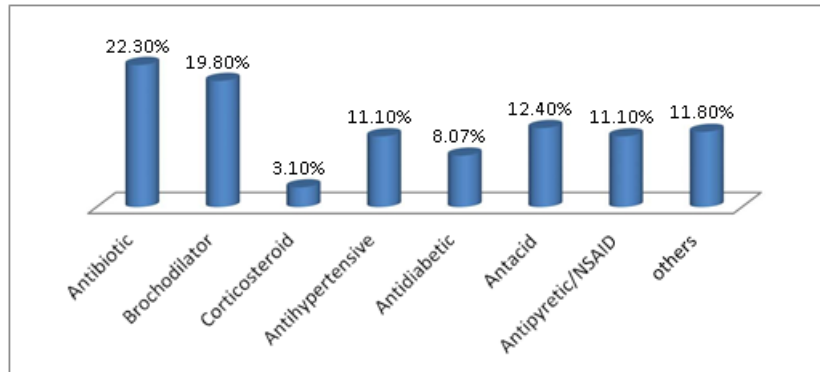

Fig 4: Drug utilization study of LRTI with HTN and DM.

Out of 25 cases of LRTI with HTN and DM collected, antibiotics (22.3%) were prescribed frequently for LRTI along with anti- hypertensives (11.1%) and hypoglycemic agents(8.07%). Supportive therapy includes corticosteroids, NSAIDs, antacids and others (Fig4).
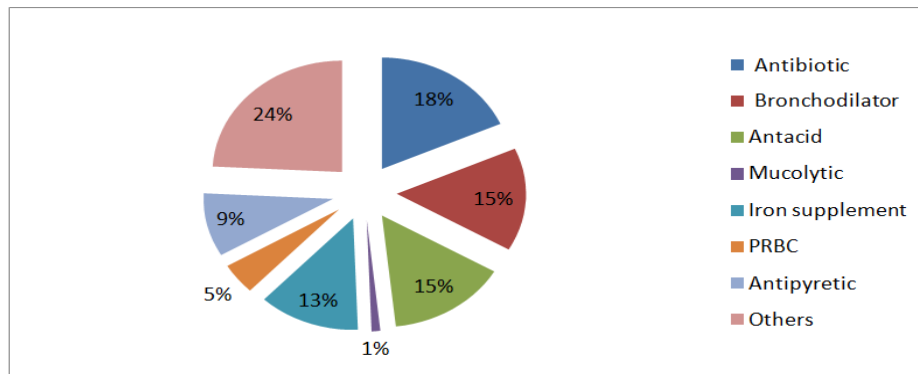

Fig. 5: Drug utilization study of LRTI with anemia.

Out of 14 cases of LRTI with anemia collected, antibiotics along with supportive were prescribed for LRTI and for anemia, iron supplements and packed RBC transfusion were provided(Fig 5).

Table 5: Drug utilization study of LRTI with TB and COPD.

DRUGS	NO. OF DRUGS	PERCENTAGE
Antibiotic	42	24.8%
Bronchodilator	48	28.4%
Antacid	23	13.6%
Corticosteroid	07	4.1%
NSAIDs/Antipyretic	20	11.8%
Vitamins	04	2.3%
Others	25	14.7%

Out of 25 cases of LRTI with TB collected, antibiotics (24.8%) and bronchodilators (28.4%) were mostly prescribed for LRTI, TB and COPD along with supportive therapy (Table 5).
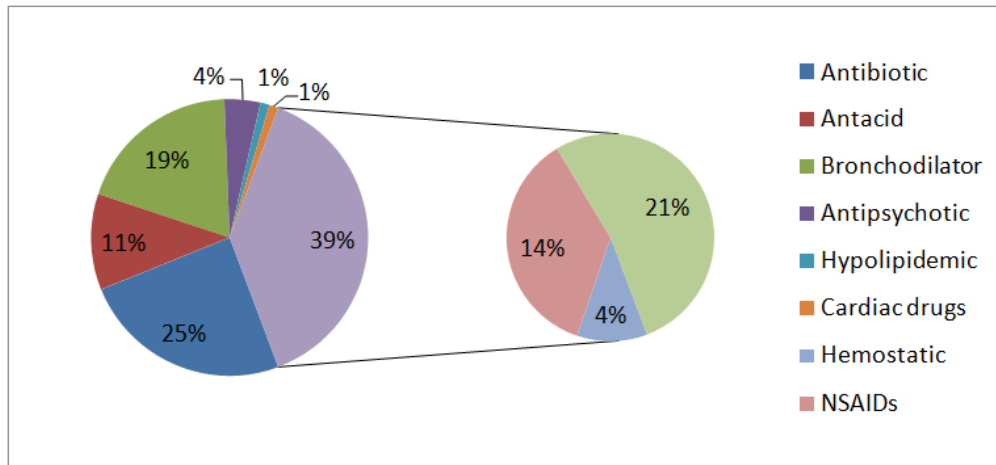
Fig. 6: Drug utilization study of LRTI with others.

Table 6: Drug utilization study of otitis media.

Drugs		No. Ofdrugs	Total no.Of drugs	Percentage
Antibiotic	Ceftriaxone	8	12	24%
	Amikacin	2		
	Piperacillin+Tazobactum	1		
	Amoxicillin+ Clavulanic acid	1		
Antacid	Ranitidine	9	9	18%
Ear drop	Ofloxacin	3	3	6%
NSAIDs	Diclofenac	11	11	22%
Miscellaneous	Anti-allergic	11	15	30%
	Antiprotozoal	2		
	Antiemetic	2		

There were 9 single cases of otitis media for which antibiotic (24%) were prescribed among which ceftriaxone was mostly common given followed by amikacin, piperacillin-tazobactam combination and amoxicillin-clavulanate combination. Supportive therapy includes ear drops(ofloxacin,ciprofloxacin), NSAIDs (diclofenac), antacids, anti-histamines (cetirizine, chlorpheniramine maleate) and anti-emetics (Table 6).

Table 7: Drug utilization study of sinusitis and rhinitis.

Drugs		No. Ofdrugs	Total no.Of drugs	Percentage
Antibiotic	Ceftriaxone	15	35	26.1%
	Amikacin	4		
	Cefotaxim	8		
	Doxycycline	6		
	Piperacillin+Tazobactum	2		
Antacid	Ranitidine	31	31	23.1%
Expectorant	Ambroxol+Guaifenesin	3	3	2.2%
NSAIDs/Antipyretic	Diclofenac/ Paracetamol	35	35	26.1%
Miscellaneous	Nasal decongestant	3	30	22.3%
	Corticosteroid	4		
	Antiseptic	2		
	Antihistamine	5		
	Antiemetic	9		
	Antiprotozoal	5		
	Vitamin	2		

Out of 28 cases of sinusitis and rhinitis collected, antibiotics (26.1%) and NSAIDs and antipyretics (26.1%) were most frequently given. Cephalosporins were most commonly given. Diclofenac and paracetamol were also given as adjuvant therapy. Supportive therapy includes nasal decongestants (xylometazoline),antacids, anti-histamines (cetirizine), anti- emetics (ondansetron) (Table 7).
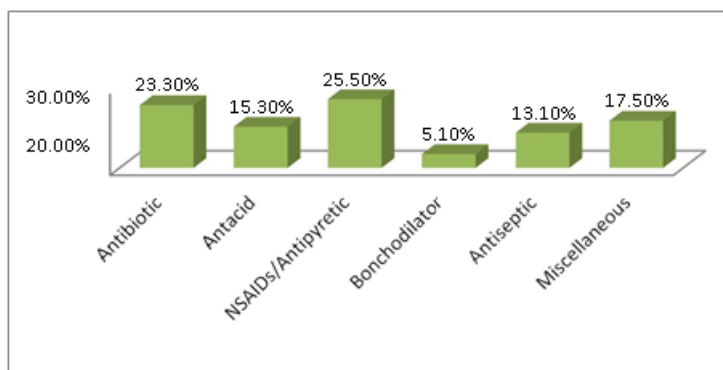
Fig. 7: Drug utilization study of pharyngotonsillitis and laryngitis.

Out of 24 cases collected, antibiotics (23.3%) were commonly prescribed along with adjuvant therapy which includes throat gargle (betadine mint gargle). Supportive therapy includes antacids, NSAIDs, bronchodilator, anti-histamines and some vitamins (Fig 7).

Who Drug Prescribing Indicators
Table 8: WHO drug prescribing indicators.

Sl. No.	Prescribing indicators	Who Scale	Obtained Value
1.	Average number of drugs per prescription	1.6-1.8	5.9
2.	Percentage of drugs prescribed by generic name	100%	61.7%
3.	Percentage of encounters with antibiotics prescribed	20.0-26.8%	23.8%
4.	Percentage of encounters with an injection prescribed	13.4-24.1%	57.3%
5.	Percentage of drugs prescribed from WHO essential drug list	100%	69.7%

Of the 1068 drugs prescribed, average number of drugs per prescription was 5.9. Percentage of drugs prescribed by generic name was found to be 61.7% which was less than the value given by WHO scale. Percentage of encounter with antibiotics prescribed were 23.8% and it is good sign that prescribing less number of antibiotics helps to prevent resistance to it. Percentage of encounter with an injection was found to be 57.3% when compare to the WHO scale the obtained value of encounter with an injection is more. Percentage of drugs prescribed from WHO Essential drug list were 69.7% which was less than the value given by WHO scale.

SUMMARY
A retrospective study was conducted among 180 patients to assess the drug prescribing pattern of in patients who are admitted in the General medicine department of government tertiary care hospital, Mandya. The required details from the patient case sheets were recorded in a suitably designed patient profile form. The prescription data of 180 patients were analysed in the current study, out of which 100 were males and 80 were females. Among 180 cases, majority of the patients fall in the age group 18-30 years and the minimum number of patients fall in the age group of 46-60 years. Nearly 53% of admitted patients were smokers and 47% were non-smokers. In our study, the highest number of patients were admitted for LRTI with comorbidities (57.3%) and minimum patients were admitted for URTI which mainly includes pharyngitis and laryngitis (1.1%). Out of 1068 drugs, the most commonly prescribed drugs among patients were supportive therapy/miscellaneous drugs (30.6%) followed by antibiotics (23.5%). Cephalosporins were most commonly prescribed antibiotics followed by amikacin. Most of the drugs were prescribed in generic name and the average number of drug per prescription was found to be 5.9 and 69.7% drug is prescribed from WHO essential drug list. All the patients were found to be symptomatically improved.

The present study provides valuable insight about the overall pattern of drugs in General medicine department. Different groups of drug are prescribed to the patient in general medicine department and the number of total drugs prescribed depends on the severe condition of patient admitted. Average number of drugs should be kept as low as possible to minimize the risk of drug interaction and development of resistance. The rational and cost effective prescribing can be promoted by conducting pharmacoepidemiological studies and by educating and training the physician by organizing medical education programme along with public education.

CONCLUSION
Our study concludes that, most of the patients admitted for respiratory tract infections were mostly males compared to females. Majority of patients were suffering from LRTI with comorbidities. After the analysis of data, it was found that intravenous route of administration was the most preferred route of administration in which injection ceftriaxone were mostly prescribed upon admission to the hospital followed by injection amikacin.

Antibiotics were the preferred drug of choice. Rationality of the prescription were assessed using WHO core drug prescribing indicators which showed that 69.7% drugs were given from essential drug list and 61.7% drugs were prescribed by generic name.So appropriate prescribing guidelines is required to reduce the drug resistance and to make the drug utilization in the general medicine department rational as far as possible.

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