A Study on Patterns of Drug Utilization in Rural Areas near By A Tertiary Care Teaching Hospital in Telangana. An Observational, Non Interventional Study.

Avula Naveen[1], Sowmya deepthi chavala*[2], Syed Ilias basha*[3]

1(.Assistant Professor, Government Medical College-Nizamabad)
2(.Assistant professor, Maheshwara Medical College-Hyderabad)
3(.Assistant Professor, GIMSR,GITAM University-Visakhapatnam)
Corresponding Author: Sowmya deepthi chavala

Abstract:
Introduction: Drug utilization studies(DUS) play crucial role in the health sector and ultimately provides insight into the efficiency of drug use and results of such research can be used to help to set priorities for the rationale use of medicines and allocation of health care budgets.
Materials And Methods: This project was a Non-interventional, Observational and Cross sectional study conducted in rural villages near by Government Medical College/General hospital, Nizamabad, Telangana. A total of 650 households were surveyed and collected information about the drug utilization patterns.
Results: In this study, we observed that a total of 2678 drugs were prescribed. Therefore, average number of drugs prescribed per patient was found to be 3.67. With regard to dosage forms, it was found that majority of drugs prescribed were oral (84.39%) and the observed disease pattern was variable, Diseases of the Cardiovascular system were maximum 25.68%.The most common drug groups prescribed were multivitamins 24.19% then Non Steroidal Anti-Inflammatory Drugs (NSAIDs) 17.47%.
Conclusions: DUS increases its importance in pharmacoepidemiology by bridging more closely with other areas such as public health, rational use of drugs, evidence based drug use, pharmacovigilance, pharmacoeconomics, eco pharmacovigilance and pharmacogenetics.
Keywords: Drug utilization studies, Rational use of Medicines, Pharmacoepidemiology.

I.   Introduction

Drug utilization study is defined as "the marketing, distribution, prescription and use of drugs in a society, with special emphasis on resulting medical, social and economic consequences.[1]

Drug utilization studies are powerful exploratory tools to ascertain the role of drugs in society[2]. They create a sound socio-medical and health economic basis for healthcare decision making.

Drug utilization studies play crucial role in the health sector and ultimately provides insight into the efficiency of drug use and results of such research can be used to help to set priorities for the rationale use of medicines and allocation of health care budgets[3].

The quality of life in developing countries can be improved by enhancing the standards of medical treatment at all levels of the health care delivery system. Medical audit definitely plays an important role in implementation of these standards[4].

Measurement of drug use in health facilities not only describes drug use patterns and the behavior of prescribers but also helps in the identification of poly pharmacy and the problems associated with it. Drug utilization research is an essential part of pharmaco-epidemiology. Together, they can provide insights into the various aspects of drug use and drug prescribing like pattern of use, quality of use, determinants of use and outcomes of use[5].

Rational drug prescribing is defined as the use of the least number of drugs to obtain the best possible effect in the shortest period and at a reasonable cost[6]. Irrational prescription of drugs leads to unproductive and risky treatment and poses a major risk of present day medical practice.

Drug utilization data may be used to produce crude estimates of disease prevalence and also used to plan drug importation, production, and distribution, and to estimate drug expenditures.

It mainly helps the healthcare system to understand, interpret and improve prescription, administration and use of medications

---

II. Materials And Methods

This project was a Non-interventional, Observational and Cross sectional study conducted in rural villages near by Government Medical College/General hospital, Nizamabad, Telangana. We started the study after obtaining approval from the Institutional Ethics Committee. We have made field visits to the households of different villages and inquire them about their knowledge and behavioural patterns on drug disposal methods. In addition to this we also generated the data on drug utilization patterns in the same area. The study was undertaken on sidelines of the main study i.e Drug disposal methods in Rural areas.

Inclusion criteria: 1.We included only the households willing to share the information

2. Households of Rural villages

Exclusion criteria: 1.Households not willing to share the information

2. Households of Urban areas

Total 650 households were surveyed and collected information about the drug utilization patterns. There were total 728 patient's case records evaluated for different parameters such as Demographic profile of the study population which includes Gender wise distribution of the patients and Age wise distribution of the patients. Then about the disease pattern i.e type of disease they are suffering from like diseases of Cardiovascular system, Respiratory system, GIT, Musculoskeletal system, CNS etc. There after Patterns of Dosage formulations used like Oral, Injectables, Inhalational, Topical etc. Finally Patterns of Drug usage like frequently prescribed Drugs such as Multivitamines, Pain killers, Antibiotics, Antihypertensives, Antihistamines etc. Results were analysed by using simple statistical measures like Averages and Percentages.

III. Results

We generated the data from the 650 households during February-March Months of the year 2019. We found there were total 728 patients and we observed the Medicaments and relevant case records of them. Our study shown the following results, when we observed the demographic profile of the patients the study revealed that female patients were more in number (53.84%) compared to male patients (46.15%). With regard to age group majority of patients (26.78%) were belonged to 46–60 years age group, then 23.76%, 18.95%, 13.18% ,11.53%,5.76% belonged to 31–45 years, 61–75 years, 1–15 years ,16-30 years,>75 years age group, respectively (Table.No.1 & Figure.No.1 and Table.2 & Figure.No.2), explain the aforementioned observations.
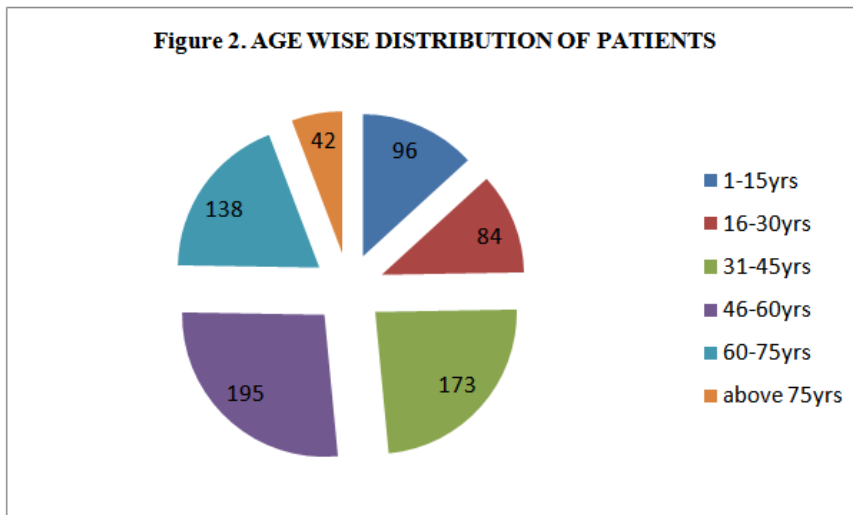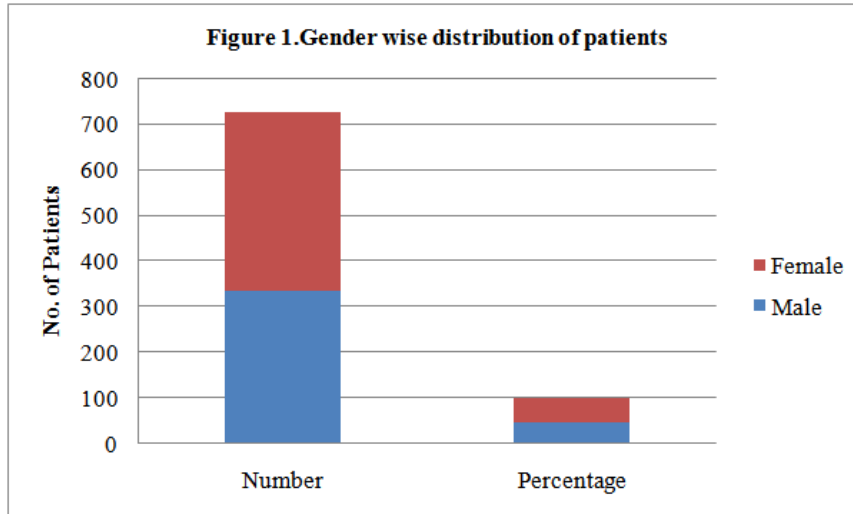
Demographic profile of the participants:

Table No.1 Gender wise distribution of the patients.

	Sex distribution	No. of patients	Percentage
1.	Males	336	46.15
2.	Females	392	53.84

Table No.2. Age wise distribution of the patients.

	Age group (Yrs)	Number	Percentage
1.	1-15	96	13.18
2.	16-30	84	11.53
3.	31-45	173	23.76
4.	46-60	195	26.78
5.	61-75	138	18.95
6.	Above 75	42	5.76

Figure 1.Gender wise distribution of patients

Figure 2. AGE WISE DISTRIBUTION OF PATIENTS

The observed disease pattern was variable. Diseases of the Cardiovascular system were maximum 25.68% followed by diseases of Respiratory system 20.05% and diseases of Endocrine system 17.03 %. Diseases of GastroIntestinal system were 15.65%, diseases of central nervous system were 5.21%, diseases of Musculoskeletal system were 10.02%, and infectious and parasitic diseases were 6.3% (Table.No.3 & Figure.No.3) explain the above results.

Table No.3 disease patterns

|	Disease pattern	Number of Patients	(%)
1.	Diseases of respiratory system	146	20.05
2.	Diseases of digestive system(GIT)	114	15.65
3.	Diseases of cardiovascular system	187	25.68
4.	Diseases of central nervous system	38	5.21
5.	Infectious and parasitic diseases	46	6.31
6.	Diseases of musculoskeletal system	73	10.02
7.	Diseases of endocrine system	124	17.03

Figure.3. Disease Pattern
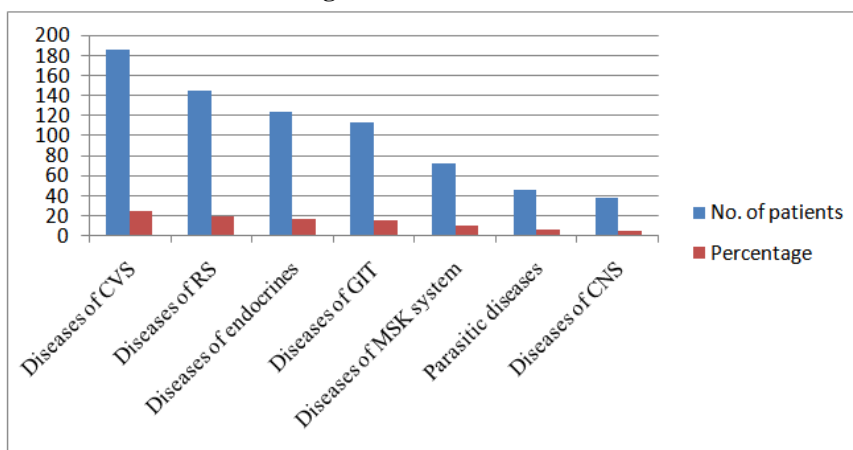
In this study, we observed that a total of 2678 drugs were prescribed. Therefore, average number of drugs prescribed per patient was found to be 3.67. With regard to dosage forms, it was found that majority of drugs prescribed were oral (84.39%) followed by Inhalational (6%), Injectables (5.3%) and topical (4.43%). (Table.No.4 & Figure.No.4. explain about the dosage formulations).

Table 4: Drug dosage formulations profile	
Parameters	**Number of drugs (%)**
Dosage forms	
Oral	2260(84.39)
Injectables	114 (5.3)
Topical	142 (4.43)
Inhalational	162(6.04)
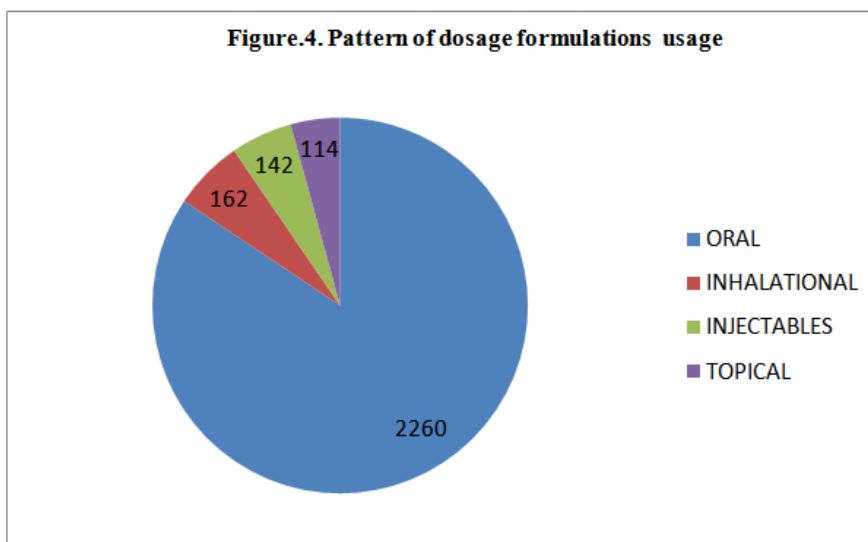
The most common drug groups prescribed were multivitamins, minerals, and enzymes 24.19%, Non Steroidal Anti-Inflammatory Drugs (NSAIDs) 17.47%, Anti-Hypertensives 12% , Antiulcer drugs 11.42%, Antibiotics 9.74%, Antihistamines 10.23%, Antidiabetics 4.4%, Antiparasitic and antifungals 4%, and expectorants and bronchodilators 3.43% (Table.No.5 & Figure.No.5) explain about these details

Table No.5. Drug usage pattern

Category of drugs	Number of drugs	Percentage
NSAIDS	468	17.47
Opioid analgesics	82	3.06
Antibiotics	261	9.74
Anti-ulcer drugs/GIT	306	11.42
Anti-Diabetic drugs	118	4.4
Anti-Hypertensives	322	12.02
Antihistaminics	274	10.23
Anti-parasites and antifungals	107	4
Multivitamins, minerals & enzymes	648	24.19
Expectorants & Bronchodilators	92	3.43

Figure.5. Drug usage pattern
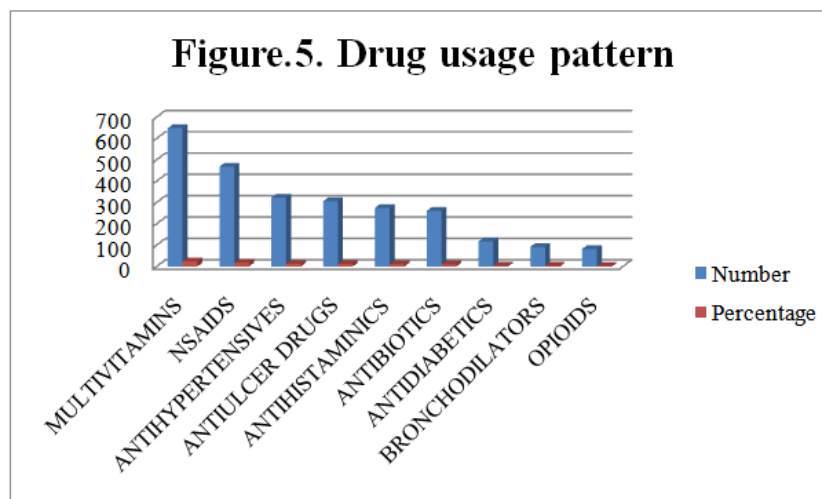
IV. Discussion

Drug utilization studies are essential part of pharmaco-epidemiological studies which provide a proper understanding usage pattern of drugs, quality and efficiency use of drugs and its outcomes[7]. These studies can play a key role in helping the healthcare system to understand, interpret and improve the prescribing administration and to maintain the rational use of Medicines. Further it assists the physician's prescribing attitude in accordance with the predetermined standards by allocating them with the feed-back and also in designing, conducting and imparting educational programmes for healthcare providers[8]. These studies should become a method of increasing job satisfaction and means of education for health professionals, rather than being perceived as threat or another bureaucratic burden[9].

The demographic profile of the patients of our study revealed that female patients were more in number (53.84%) compared to male patients (46.15%). With regard to age group majority of patients (26.78%) were belonged to 46–60 years age group, then 23.76%, 18.95%, 13.18%,11.53%,5.76% belonged to 31–45 years, 61–75 years, 1–15 years,16-30 years,>75 years age group, respectively.

In our study, the total number of drugs in 728 case records analyzed were 2678. Therefore, average number of drugs prescribed were 3.67. This number is little close to the WHO recommended a limit of 2.0[10] and other studies[11]. And it is less when compared to other studies[12]. Increase in the number of average drugs per prescription may increase the risk of drug interactions, may lead to unwanted side effects and also increases the prescribing and dispensing errors. However, in certain conditions like cardiovascular problems, the patients may require more than one drug. The recently published Seventh Report of the Joint National Committee on prevention, detection, evaluation, and treatment of high blood pressure guidelines also permit polypharmacy in hypertension[13].

With regard to dosage forms, it was found that majority of drugs prescribed were oral (84.39%) followed by Inhalational (6%), Injectables (5.3%) and topical (4.43%).Prescription of injectables was less when compared to other two Indian studies which reported 7% and 6.8% use of Injectables, respectively[14,15]. We need to reduce the unnecessary use of injectables to prevent HIV and other blood-borne infections[16].

FDCs of antibiotics are highly popular in the Indian pharmaceutical market. Studies are showing extensive use of a fixed dose of antimicrobials in developing countries. Though WHO has approved only 25 FDC in the 15th edition of the WHO essential drugs list[17]. In our study, overall FDCs used were in 14.5% of Cases. This figure is comparatively similar with other studies [18]. Increased use of FDCs may warrant

inappropriate use of unwanted drugs which can lead to adverse effects and drug interactions. Use of FDCs should be discouraged unless strictly necessary.

Antibiotics prescribed were 9.74% of total drugs. It is less when compared to other studies[19].. According to the WHO, in developing countries, 15–25% of prescriptions with antibiotics are expected where infectious diseases are prevalent[20]. Previous studies reported that the use of antibiotic was 78% in Bangladesh, whereas it varied from 40 to 80% in India.

Appropriate use of antibiotics is absolutely necessary to prevent the emergence of drug resistance and should be mostly used after culture sensitivity testing. Most of the acute respiratory and acute gastroenteritis cases are viral in nature and may not need antibiotics. An antibiotic policy should be formulated so that the clinicians can use them judiciously according to patient's need.

The most common categories of drugs prescribed were multivitamins, minerals, and enzymes, i.e., 24% followed by NSAIDs which were 17%, Anti-Hypertensives 12% , Antiulcer drugs 11.42%, Antibiotics 9.74%, Antihistamines 10.23%, Antidiabetics 4.4%, Antiparasitic and antifungals 4%, and expectorants and bronchodilators 3.43%. Doctors should not prescribe unnecessary medicines such as multivitamins, minerals, and enzymes unless absolutely required by the patient. They should adhere and prescribe from the National List of Essential Medicines and also they should follow SANE criteria for rational prescribing i.e Safety, Affordability, Need and Efficacy.

V. Conclusions

Drug utilization derives its importance in pharmacoepidemiology from the fact that it provides the methodological rigor for defining the denominator data needed in pharmacoepidemiological research. The study of drug utilization is an evolving field. The use of computerized databases that links drug utilization to diagnosis, although subject to some inherent limitation, is contributing to expansion of this area of study. DUS increases its importance in pharmacoepidemiology by bridging more closely with other areas such as public health, rational use of drugs, evidence based drug use, pharmacovigilance, pharmacoeconomics, eco pharmacovigilance and pharmacogenetics.

Acknowledgement

References

[1]. Shankar PR, Upadhyay DK, Subish P, Bhandari RB, Das B. (2010). Drug utilization among older inpatients in a teaching hospital in Western Nepal. Singapore Med J. 51:28–34.

[2]. Avula N, Sravani MR. Study of drug utilization trends in respiratory tract infections in a tertiary care teaching hospital: a retrospective study. Int J Basic Clin Pharmacol 2017;6(11):1-4.

[3]. Bakssas I, and Lunde PKM. National drug policies: the need for drug utilization studies. *Trends Pharmacol. Sci.* **7:**331-334 (1986).

[4]. Nehru M, Kohli K, Kapoor B, Sadhotra P, Chopra V, and Sharma R. Drug utilization study in outpatient ophthalmology department of government medical college Jammu. *JK Science*, **7:**149-151 (2005).

[5]. Avula Naveen, Dr. MR Sravani and J Naresh Venkat. Drug utilization patterns in acute coronary syndrome at a tertiary care teaching hospital: A retrospective, non interventional and observational study.The Pharma Innovation Journal 2017; 6(9): 538-542

[6]. Curtis P. (1974). Medical audit in general practice. J R Coll Gen Pract 24:607-611

[7]. Shimpi RD, Salunkhe PS, Bavaskar SR, Laddha GP, Kalam A, Patel KA. Drug utilization evaluation and prescription monitoring in asthmatic patients. Int. J. Pharm. Bio. Sci. 2012;2(1):117-22.

[8]. Varkey S, Sen S. Prescribing patterns of corticosteroids in Pulmonology Department. IJPTP. 2012;3:334-37.

[9]. Nandimath MK, Ahuja S. Drug Prescribing Pattern In Upper Respiratory Tract Infection In Children Aged 1–14 Years. International Journal of Pharma and Bio Sciences . 2012;3(1):299-308.

[10]. World Health Organization. How to Investigate Drug Use in Health Facilities, Selected Drug use Indicators, WHO/DAP/93.1. Geneva: WHO; 1993.

[11]. Naveen A, Ramesh B, Siwani Teki.Prescription Auditing in regard with the Prescription patterns in a Tertiary Care Teaching Hospital. *Asian J Pharm Clin Res, Vol 11, Issue 2, 2018, 176-180.*

[12]. Gogoi S, Saikia PP. A study on prescribing pattern of antibiotics for upper respiratory tract infections by general practitioners in rural areas of Assam. IJSR. 2015;4(5):60-2.

[13]. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL, *et al*. The seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure. JAMA 2003;289:2560-71.

[14]. Rishi RK, Sangeeta S, Surendra K, Tailang M. Prescription audit: Experience in Garhwal (Uttaranchal), India. Trop Doct 2003;33:76-9.

[15]. Maini R, Verma KK, Biswas NR, Agrawal SS. Drug utilization study in dermatology in a tertiary hospital in Delhi. Indian J Physiol Pharmacol 2002;46:107-10.

[16]. Hutin YJ, Hauri AM, Armstrong GL. Use of injections in healthcare settings worldwide, 2000: Literature review and regional estimates. BMJ 2003;327:1075.

[17]. Gor AP, Ajbani A, Dalal K. Use of fixed dose combinations of antibiotics in a surgical department of a tertiary care teaching hospital. Int J Pharm Pharmsci 2015;7:259-62.
[18]. Chakrabarti A. Prescription of fixed dose combination drugs for diarrhoea. Indian J Med Ethics 2007;4:165-7.
[19]. Gupta N, Sharma D, Garg SK, Bhargava VK. Auditing of prescriptions to study utilization of antimicrobials in a tertiary hospital. Indian J Pharmacol 1997;29:411-5.
[20]. Lamichhane DC, Giri BR, Pathak OK, Panta OB, Shankar PR. Morbidity profile and prescribing patterns among outpatients in a teaching hospital in Western Nepal. Mcgill J Med 2006;9:126-33.