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Study Evaluating Appropriateness of Utilization Pattern of Drugs in Various Departments of A Tertiary Care Rural Hospital

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ABSTRACT

Drug utilization studies make pharmacotherapy more effective, rational and cost effective. It is for this purpose this study was conducted.

METHODOLOGY: This prospective, cross sectional, observational study was conducted in the 1500 patients of any age and either sex, 1000 indoor patients and 500 OPD, from various departments of Dhiraj Hospital, Piparia. Various aspects of drug utilization were captured. semi scientific 20 point " Appropriateness scale".

RESULTS: In total, 2416 drugs were prescribed to the patients. Average number of drugs per patient was found to be 1.61. Of the 2416 drugs, 2125 (88.00%) were prescribed by brand names while only 291 (12.00%) medicines were prescribed by generic names. Only 30.01% of the prescribed drugs belonged to the essential medicine list and 35.55% of the prescribed drugs were rational. Of the drugs prescribed, 82.78% were FDCs. It was found that out of all drugs 90.15% drugs found to be appropriate for dosage form and route of administration whereas 09.85% were found to be inappropriate for dosage form and route of administration. Out of all drugs 90.15% drugs found to be appropriate for dosage form and frequency of administration whereas 09.85% were found to be inappropriate for dosage form and frequency of administration. Evaluation of appropriateness of frequency of administration revealed that 56.73% drugs were most appropriate, 33.42% were appropriate and 09.85 drugs found to be inappropriate.

CONCLUSION: It is the need of hour to conduct drug utilization studies and ensure that doctors prescribe rational medicines.

KEY WORDS: Appropriateness, Brand name, Drug utilization, Essential medicine, FDC, Generic name.

1. INTRODUCTION

The present day pharmacotherapeutics includes the use of single-ingredient medicines and / or fixed-dose drug combinations. [1] Irrational use of medicines is widely prevalent and is found at all levels of health care. Use of FDCs is one reason for such irrational drug use. The other important reason for irrational use of medicine is the use of non-essential medicines, instead of using essential medicines. WHO has defined essential medicines as "those that satisfy the healthcare needs of majority of population; they should be available at all times in adequate amounts and in appropriate dosage forms." [2] There are 352 drugs in WHO's17th (March, 2011) essential medicine list. Among them, 24

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FDCs are included in that list. Similarly, the 3rd National Essential List of Medicines of India (2011) contains only 348 medicines of which 16 are FDCs. As against this, nearly 1,00,000 formulations or medicines are available in India of which nearly half are FDCs, majority being irrational. Drug utilization studies help in identifying disease pattern and drug use among patients. It also helps to promote rational use of medicines. [3] Drug utilization research was defined by 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" [4]. Realizing the enormous potential of drug utilization studies in the promotion of rational drug therapy, international agencies have applied themselves to evolve standard drug use indicators and data collection methods.
The issues drug utilization studies; rational use of medicine; essential medicine; etc are very relevant in the Indian context. Though studies have partly been done in this regard from time to time, comprehensive studies incorporating all aspects are not done. If such studies are done, they may prove worthwhile in making the pharmacotherapy more effective, rational and cost effective. It is for this purpose we are proposing the study.

2. METHODOLOGY

This was a prospective, cross sectional, observational study and was conducted in the patients of Dhiraj Hospital, Sumandeep Vidyapeeth, Piparia, in 1500 patients, 1000 indoor patients and 500 OPD patients on prorata basis from various departments during different time phases were enrolled. This study was started only after receiving due permission from Institutional Ethics Committee of Sumandeep Vidyapeeth.

INCLUSION CRITERIA: Patients of any age and either sex admitted or visiting the OPD/IPD during the period from 01st Jun 2013 to 31st Dec 2017 to Dhiraj hospital .

EXCLUSION CRITERIA: Patients not willing to participate in the study or not willing to sign ICF. Serious patients not in position to share information or answer to questions.
Indoor patients that were enrolled were visited daily by the investigator and relevant information/observations were entered in a structured Case Report Form for this purpose. The patients were visited daily from the day of admission till the day of discharge for indoor patients. Outdoor patients were interviewed once only at the time of recruitment and relevant information were collected using interview method and from hospital case record note.

After compilation of data and entries made, the analysis was carried out to find:

I. CHARACTERISTICS OF MEDICINES USED

1. The number of medicines used and their categories.
2. Whether the medicines are prescribed by the official (INN, generic) names or trade (brand) names.
3. Rationality of medicines/FDCs based on WHO criteria.
4. How many FDCs are used and their categories.
5. Whether the medicines/ FDCs prescribed are rational/semirational/irrational.

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II. APPROPRIATENESS OF USE OF MEDICINES

Accepting that the diagnosis made by the physician and treatment mated out by him are correct ,appropriateness of medicines used will be evaluated by using a semi scientific 20 point " Appropriateness scale" as under [7]

Appropriateness of drug use	V Points
Dosage form	
Appropriate	2
I Inappropriate	0
Route of administration-	
Appropriate	3
Inappropriate	0
Dose-	
Most appropriate (dose within the therapeutic range) -	5
Acceptable (within 25% on either end of therapeutic range)-	3
I Inappropriate (outside 25% of therapeutic range on either end)-	0
Frequency of administration	
Most Appropriate	5
Acceptable	3
Inappropriate	0
Duration of therapy	
Most appropriate	5
Acceptable (within 25% on either end of therapeutic range)-	3
Inappropriate (outside 25% of therapeutic range on either end)-	0
Total Maximum Points	**20**
Appropriateness Assessment	
≥18	Most Appropriate
>14-<18	Appropriate
<14	Inappropriate

RESULT

Prescriptions of 1500 patients, 53.73% (n=806) male and 46.27% (n=694) female, were evaluated. Of these, 1000 (66.67 %) were from the patients admitted to various wards of Dhiraj hospital and remaining 500 (33.33 %) were those who attended to outdoor departments.

Data from OPD as well IPD of 10 departments was collected. In total, 2416 drugs were prescribed to the patients. Average number of drugs per patient was found to be 1.61. In OPD the average number of drug per patient was found to be 1.62. Similarly in IPD it was found to be 1.60. It was found that in medicine department average number of drug was 3.52 followed by 2.41 in Orthopedics department, 2.25 in Surgery department, 2.15 in Obs & Gynec department, 2.03 in Pediatrics department, 1.65 in ENT department, 1.64 in Ophthalmology department, 1.52 in Skin & VD department, 1.32 in Respiratory department and 1.28 in Psychiatry department.

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Of the 2416 drugs, 2125 (88.00%) were prescribed by brand names while only 291 (12.00%) medicines were prescribed by International Nonproprietary Names or Generic names.

TABLE 1 PRESCRIPTION BY BRAND NAME OR GENERIC NAME

Department	Out Patient Department					In Patient Department				
	Branded	%	Generic	%	Total	Branded	%	Generic	%	Total
Ortho	92	91.09%	9	8.91%	101	248	95.38%	12	4.62%	260
Obs & Gynec	98	98.00%	2	2.00%	100	198	89.19%	24	10.81 %	222
Surgery	107	8 6.29%	1 7	13.71 %	124	183	85.51%	31	14.49 %	214
Medicine	154	88.51%	20	11.49 %	174	324	89.75%	37	10.25 %	361
Ophthalmology	38	100.00 %	0	0.00%	38	85	100.00 %	0	0.00%	85
ENT	36	90.00%	4	10.00 %	40	71	84.52%	13	15.48 %	84
Pediatrics	90	74.38%	31	25.62 %	121	132	72.13%	52	27.87 %	183
Psychiatrics	27	77.78%	4	22.22 %	31	58	84.00%	7	16.00 %	65
Res. Med	32	75.00%	5	25.00 %	38	52	81.58%	9	18.42 %	61
Skin	38	75.00%	7	25.00 %	45	62	82.14%	7	17.86 %	69

The categorization of various drugs into essential / non-essential, rational / irrational, FDC/Single drug was as shown in table 2.

TABLE 2 PRESCRIPTION OF ESSENTIAL / NON-ESSENTIAL AND RATIONAL / IRRATIONAL MEDICINES

Categorization of drugs		N	%
Essential (E)		725	30.01%
Non-Essential (NE)		1691	69.99%
Total		2416	100%
Rational (R)		859	35.55%
Irrational (IR)		1557	64.45%
Total		2416	100%
FDC	OPD	723	29.9%
	IPD	1277	52.8%

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Single Drug	416	17.22%
Total	2416	100%

It was found that out of all drugs 90.15% drugs found to be appropriate for dosage form and route of administration whereas 09.85% were found to be inappropriate for dosage form and route of administration. Out of all drugs 90.15% drugs found to be appropriate for dosage form and frequency of administration whereas 09.85% were found to be inappropriate for dosage form and frequency of administration. Evaluation of appropriateness of frequency of administration revealed that 56.73% drugs were most appropriate, 33.42% were appropriate and 09.85 drugs found to be inappropriate. With regards to duration of therapy, 56.73% drugs were found to be most appropriate, 33.42% were appropriate and 09.85 drugs found to be inappropriate.

TABLE 3 APPROPRIATENESS OF VARIOUS PARAMETERS

Appropriateness Parameters	Most Appropriate		Appropriate		Inappropriate		Total	
	N	%	N	%	N	%	N	%
Dose	1371	56.75%	807	33.40%	238	09.85%	2416	100.00%
Frequency of administration	1371	56.75%	807	33.40%	238	09.85%	2416	100.00%
Duration of therapy	1371	56.75%	807	33.40%	238	09.85%	2416	100.00%
Dosage form	0	-	2178	90.15%	238	09.85%	2416	100.00%
Route of administration	0	-	2178	90.15%	238	09.85%	2416	100.00%

DISCUSSION

Providing the correct medication to the correct individuals at the right time should be a central priority of health care. The way to ensure this is often through the effective implementation of the WHO's recommendation on rational drug policies. Rational drug use while prescribing medicines has medical, social and economic implications. Prescription auditing is the mainstay of quality assurance in hospitals. They ought to address issues that have serious consequences for patients if correct treatment is not given which might minimize the misuse of medicine, plan essential drug choice and estimate the drug desires of the community.

In present study total 53.73% males and 46.27% females were enrolled, while in the study by Kaur S et al study 66.90% were males whereas 33.10% were females. [5] In Kala K et al study 47.00% were males while 53.00% were females while in the study by Alamchandani R et al, 61.6% were males and 38.4% were females. [6, 7]

In present study average number of drugs per patient was found to be 1.61 which was lower as compared to that observed in other studies. In the study by Ajapuje et al, Simpson GB et al Bhagawati *I et al* it was 3.42, 3.28, 3.40 respectively. [8, 9, 10] The average number of drugs per patient was relatively higher in the study by Kaka K et al, 8.44. [6]

In the present study, only 12% drugs were prescribed by generic names. Literature showed that in the study by Abidi A et al, only 3.79% cases were prescribed generic medicines. [11] In the study by Bhagawati I et al and Karade S et al, it was observed that generic medicines were prescribed in 36.00%

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and 73.4% of cases, respectively, which was relatively higher as compared to our study. [9, 12] Low rate of prescribing by generic name may be a indicator of indirect influence by medical representative of different pharmaceutical companies on practitioners prescribing patterns. Generic prescribing reduces the chances of dispensing errors which may be due to misinterpretation of like sounding names of drugs and also decreases the economic burden on the patients. Prescribing by brand name adds to the burden of irrational prescribing of drugs especially when one of more component of the FDC are not required for the patient, this was further confirmed in the study by Alfa J & Adigwe OP. [13]

In the present study we have found that 30.01% drugs were essential and 69.99% were non essential. 35.55% were rational and 64.456% were irrational. Contrary to out study, in the study by Kaur S et al 64.94% drugs prescribed were from national essential medicine list. [5] Similarly in the study by Kaka K et al, 66% drugs were prescribed as per essential drug list. [6] In the study by Abidi A et al, 43.50% of the prescribed drug belonged to EDL. [11]. In our study, it was found that out of 2416 drug formulations prescribed, 723 and 1277 were FDCs among OPD and IPD patients respectively. There are very few FDCs in essential medicines list. Out of the total 433 medicines listed under the 20th edition of the WHO list of essential medicines issued in August 2017, only 37 are FDCs. Similarly, the Indian list of National Essential List of Medicines (NLEM 2015) lists only 24 FDCs out of the total 376. A majority of these FDCs are aimed at improving treatment adherence and preventing drug resistance among the diseases of public health importance such as TB, HIV and Malaria. In the study by Bhagawati I et al, 84.84% of oral formulations were single and rest 15.15% were in combinations. In topical formulations 71.94% and 28.05% were single and combined preparations respectively. There was no combination of drugs used among the injectables. [9]

It was seen that for individual drugs, dose, frequency of administration, duration of therapy, dosage form and route of administration were appropriate to most appropriate in majority of the patients. This in concordance to the study by Alamchandani RR et al. [7]

From this study we have recommended that we should carry out Drug Utilization studies in tertiary care hospital on regular interval and results of the study should be discussed with the Clinician so we can reduce the use of irrational drugs, and this also helps to make statistics of drug utilization pattern. It also helps in reducing the number of prescriptions written in their brand names. Continuous Educational Intervention of Drug Utilization is required for Clinicians to increase appropriateness and rational use of the drug. Also it can help to reduce the drug cost by prescribing generic medication.

3. CONCLUSION

There is a critical need to emphasize rational use of medications among the prescriptioners. From this study we have concluded that in a tertiary care hospital we should carry out drug utilization study to increase the awareness about prescription of rational drugs, prescribing of drugs by brand name. Continuous Educational Intervention of Drug Utilization is required for Clinicians to increase appropriateness and rational use of the drug.
Irrational use of Medicines, use of irrational Fixed Dose Combinations, inappropriate use of Medicines, not prescribing the essential or generic medicine etc can lead to problem of drug interactions leading to adverse events, increase the cost of therapy and indirectly influence the patient compliance to medicines.

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Hence, it is the need of hour to see that the doctors as prescribers and dispensers, the patients as consumers are updated periodically to emphasize on meticulous use of medicines.

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