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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/15018
DOI URL: http://dx.doi.org/10.21474/IJAR01/15018

RESEARCH ARTICLE

DRUG UTILIZATION PATTERNS USING *WHO* CORE PRESCRIBING INDICATORS IN DIFFERENT OUT PATIENT DEPARTMENTS AT SECONDARY CARE HOSPITAL, KARIMNAGAR

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Manuscript Info

Manuscript History
Received: 10 May 2022
Final Accepted: 14 June 2022
Published: July 2022

Key words:-
Drug Utilization, Indicators, Prescribing, Essential Drug List

Abstract

Aim: The aim of this study is to assess the prescribing patterns of medicines, apply the World Health Organization (WHO) core indicators and to assess the appropriateness of prescribed medicines in a pediatric unit.

Materials and Methods:A prospective observational drug utilization study of outpatients was carried out in secondary care hospital for a period of 2 months. Patients who attended different units were included in the study and patients who were not willing to participate in the study were excluded and the data collected from the hospital were analyzed.

Results: Out of 150 patients, the average number of drugs per patient was 4.56. The percentage of drugs prescribed with the generic name was found to be 19.16%. Among 150 prescriptions 49.78% of the drugs were prescribed from essential drug list. Among the antibiotics 33.33% were prescribed, cephalosporin group were the most commonly prescribed followed by amino glycoside and penicillin. Nearly, 21.80% of the medicines were given as intravenous and the prescriptions without drugs were 1.43%. Only 75.6% of patients have knowledge about their dosage schedule and almost all the prescriptions were appropriate.

Conclusion: The assessment of WHO core indicators helped to improvise the prescribing pattern, identify significant problems involved in the knowledge gap of patients or caretakers understanding of instructions provided by consultants and even to minimize the cost burden on patient.

Introduction:-

Evaluation of drug prescription pattern is very crucial for patient care. Previous systematic analysis hasproposed thatquality of a prescription is an aspectwhich requires constant evaluation.[1] The rational use of drugs is mandatory for a premium health‑care system. However, irrational drug use, has become the most prevailing problem in the developing countries which is unethical and greatly decrease the standard of drug therapy along with the common widespread health complications like drug interactions, increased incidence of adverse effects, emergence of drug resistance.[2]

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World Health Organization (WHO) has reported Worldwide, more than half of all medicines are prescribed, dispensed, or sold improperly, and 50% of patients fail to take them correctly. Moreover, about one third of the world's population lacks access to essential medicines[3]Assessment of the prescribing, dispensing, and distribution patterns ofmedicines prevailing in a particular locale are done by Prescription pattern monitoring studies.[4]

The WHO Drug use indicators can be used to identify general prescribing and quality care problems at outpatient setting. They defined a limited number of objective measures that can describe the drug use situation in a country, region or individual health facility. Such measures, will allow health planners, managers and researchers to make basic comparisons between situations in different areas or at different times. These indicators measure performance in three general areas; Prescribing practices, patient care, facility-specific factors.[5] This research addresses only prescribing indicators.

The objective of this study is to assess the prescribing patterns of medicines, apply the WHO core indicators and to assess the appropriateness of prescribed medicines in secondary care hospital using the five WHO prescribing indicators which include:

1. The average number of drugs per patient
2. Encounter, percentage of drugs prescribed by generic name,
3. Percentage of encounters with an antibiotic prescribed,
4. Percentage of encounters with an injection prescribed, and
5. Percentage of drugs prescribed from essential drugs list or formulary.[6]

The optimal levels for INRUD\WHO drug use indicators:[7]

1. Average number of drugs prescribed per encounter (whether the patient actually received the drugs or not). Optimal level: ≤ 3.
2. Percentage of drugs prescribed by generic name. Optimal level: 100%.
3. Percentage of patient encounters with an antibiotic prescribed. Optimal level: ≤ 30%.
4. Percentage of patient encounters with an injection prescribed. Optimal level: ≤ 10%.
5. Percentage of drugs prescribed from the national EDL or the facility's formulary. Optimal level: 100%.

Materials And Method:-

The drug prescribing trends and its utilization were investigated in different outpatient departments like pulmonology, urology, gastroenterology, obstetrics and gynecology [OBG], general medicine, pediatrics, orthopedics and cardiology at a secondary care hospital. The present study was a prospective, observational one that spanned for a period of 2 months (March-April 2019). The core prescribing indicators do not require the collection of any information on signs and symptoms[5]. This study was conducted with the approval of Institutional Ethics committee. All the prescriptions from each department were collected, documented and information was transcribed on to format containing all particulars and applicable WHO core prescribing indicators for drug utilization study.

Patient characteristics such as name, age, sex and prescribers name and concerned department details were recorded. Drug data including name of the drug, dosage schedule, frequency, form and route of administration were also recorded from the prescriptions collected.

The data was then analyzed to find out the prescribing pattern in the hospital using the WHO core prescribing indicators as follows:

1. Average number of drugs per encounter:

1. To measure the degree of polypharmacy.
2. It can be calculated by dividing the total number of different drug products prescribed, by the number of encounters surveyed.

It is not relevant whether the patient actually received the drug[8]. (Combination drugs are counted as one.)

2. Percentage of drugs prescribed by generic name:

1. To measure the tendency to prescribe by generic name.
2. Percentage can be calculated by dividing the number of drugs prescribed by generic name by the total number of drugs prescribed, multiplied by 100.

3. Percentage of encounters with an antibiotic prescribed:

1. To measure the overall use of commonly overused and costly forms of drug therapy.
2. Percentage can be calculated by dividing the number of patient encounters during which an antibiotic is prescribed, by the total number of encounters surveyed, multiplied by 100.

4. Percentage of encounters with an injection prescribed:

1. To measure the overall level use of commonly overused and costly forms of drug therapy.
2. Percentage can be calculated by dividing the number of patient encounters during which an injection is prescribed, by the total number of encounters surveyed, multiplied by 100.

5. Percentage of drugs prescribed from EDL or formulary:

1. To measure the degree to which practices comply to a national drug policy, as indicated by prescribing from the national essential drugs list or formulary for the type of facility surveyed.
2. Percentage, calculated by dividing the number of products prescribed which are listed on the essential drugs list or local formulary (or which are equivalent to drugs on the list) by the total number of products prescribed, multiplied by 100.

Results:-

The study was conducted in 9 departments which included 11 prescribers. During the study period a total of 150 prescriptions were collected with pulmonology[14], urology[18], cardiology[7], OBG[12], orthopedic[15], dermatology[10], general medicine[33], pediatrics[20], physiotherapy[13], diabetology[8] respectively.

Analysis of WHO core drug prescribing indicators is summarized in Table.1.

Department	Avg. No. Of drugs per encounter {<=3}	Percentage of drugs prescribed by generics {100%}	Percentage of encounters with antibiotics { <=30}	Percentage of encounters with injections {<=10}	Percentage of drugs from essential drug list {100%}
Pulmonology	4.53	11.86%	42%	8.54%	66.43%
Urology	1.23	5.4%	47.21%	0.25%	72%
Cardiology	3.28	8.8%	15%	4%	85%
OBG	3	12.8%	22.14%	8.76%	69.7%
Orthopedics	5.69	0.82%	10%	7.19%	56.35
Dermatology	3.07	7.5%	20.31%	0%	53.1%
General medicine	7.61	20.20%	36%	16%	76%
Pediatrics	6.76	14.77%	14.52%	565%	87%
Physiotherapy	2.23	1.31%	7.81%	3.83%	70%
Diabetology	2.69	25.71%	2%	12.3%	82%

Table 1:- Assessment of WHO prescribing indicators in different departments in a secondary care hospital.

Average no. of Drugs per Encounter:

Department	Avg No. of drugs per encounter
Pulmonology	4.53
Urology	1.23
Cardiology	3.28
OBG	3
Orthopedics	5.69
Dermatology	3.07
General Medicine	7.61
Pediatrics	6.76
Physiotherapy	2.23
Diabetology	2.69

Table 2: Average number of drugs per encounter in different departments

Percentage of drugs prescribed by generic name:

Department	Percentage of drugs prescribed in generics
Pulmonology	11.86%
Urology	5.4%
Cardiology	8.8%
OBG	12.8%
Orthopedics	0.82%
Dermatology	7.5%
General Medicine	20.20%
Pediatrics	14.77%
Physiotherapy	1.31%
Diabetology	25.71%

Table 3:- Percentage of drugs prescribed in generics in different departments.

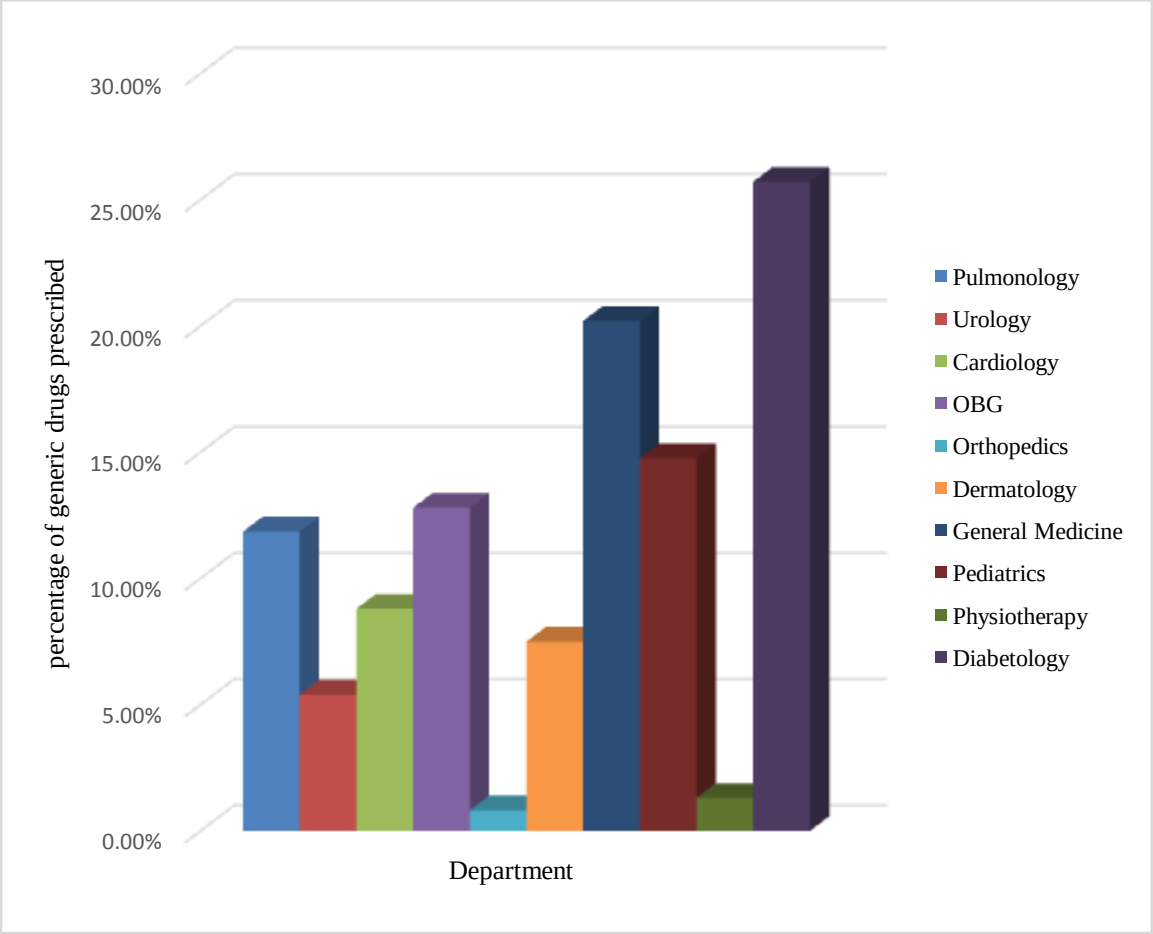

Figure 1:- Showing percentage of drugs prescribed in generics in different departments.

Percentage of encounters with an antibiotic prescribed:

Department	Percentage of encounters with Antibiotics prescribed
Pulmonology	42%
Urology	47.21%
Cardiology	15%
OBG	22.14%
Orthopedics	10%
Dermatology	20.31%
General Medicine	36%

Pediatrics	14.52%
Physiotherapy	7.81%
Diabetology	2%

Table 4:- Percentage of encounters with antibiotics prescribed in different departments.

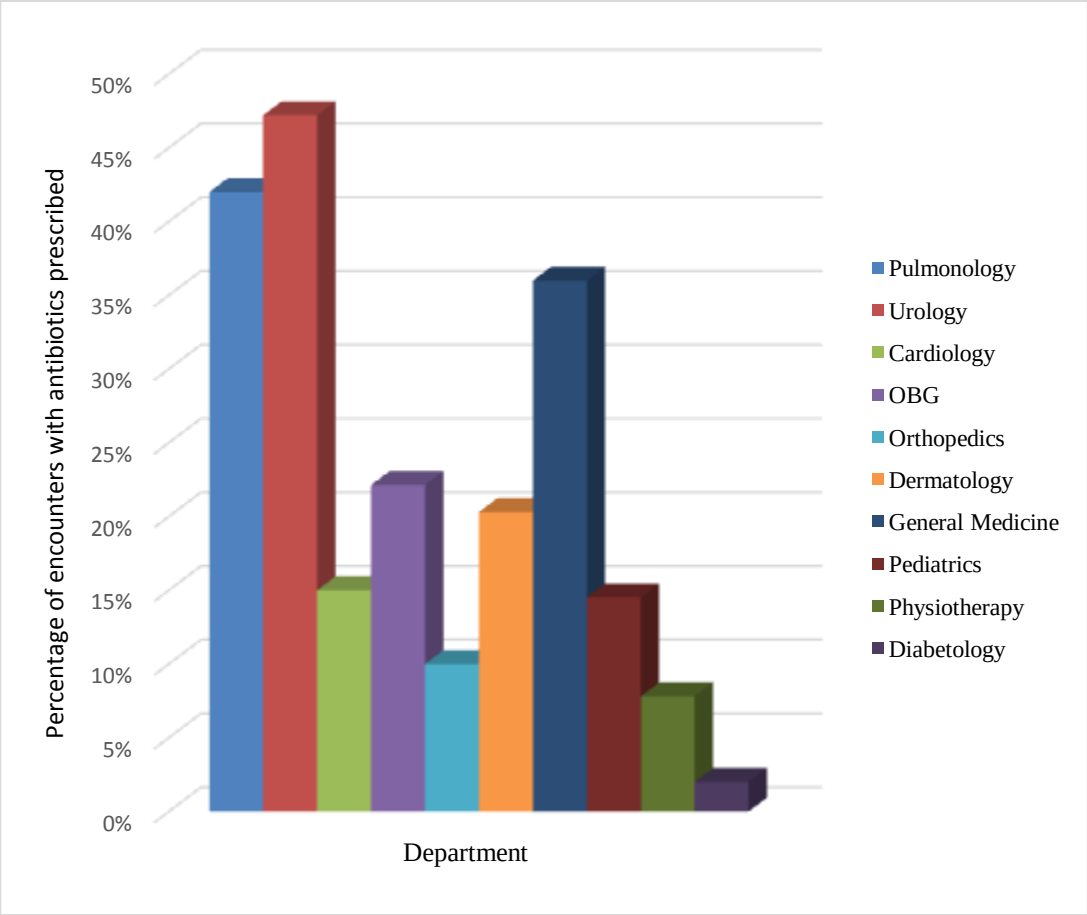

Figure 2:- Showing percentage of encounters with antibiotics prescribed in different departments.

Percentage of encounters with an injection prescribed:

Department	Percentage of encounters with injection
Pulmonology	8.54%
Urology	0.25%
Cardiology	4%
OBG	8.76%
Orthopedics	7.19%
Dermatology	0%
General Medicine	16%
Pediatrics	565%
Physiotherapy	3.83%
Diabetology	12.3%

Table 5:- Percentage of encounters with injection prescribed in different departments.

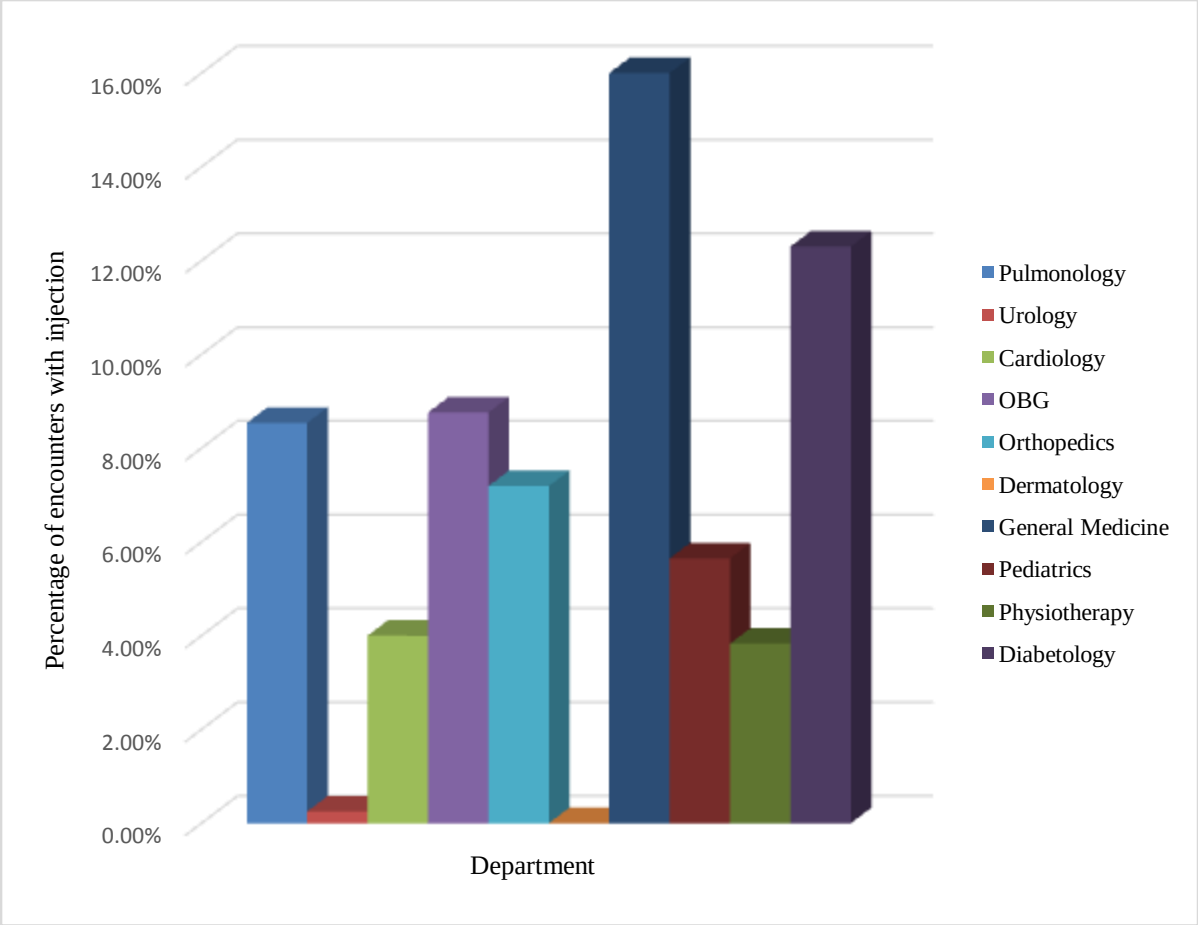

Figure 3:- Showing percentage of encounters with injection prescribed in different departments.

Percentage of drugs prescribed from EDL or formulary:

Department	% of drugs from essential drug list
Pulmonology	66.43%
Urology	72%
Cardiology	85%
OBG	69.7%
Orthopedics	56.35
Dermatology	53.1%
General Medicine	76%
Pediatrics	87%
Physiotherapy	70%
Diabetology	82%

Table 6:- Showing percentage of drugs prescribed from EDL in different departments.

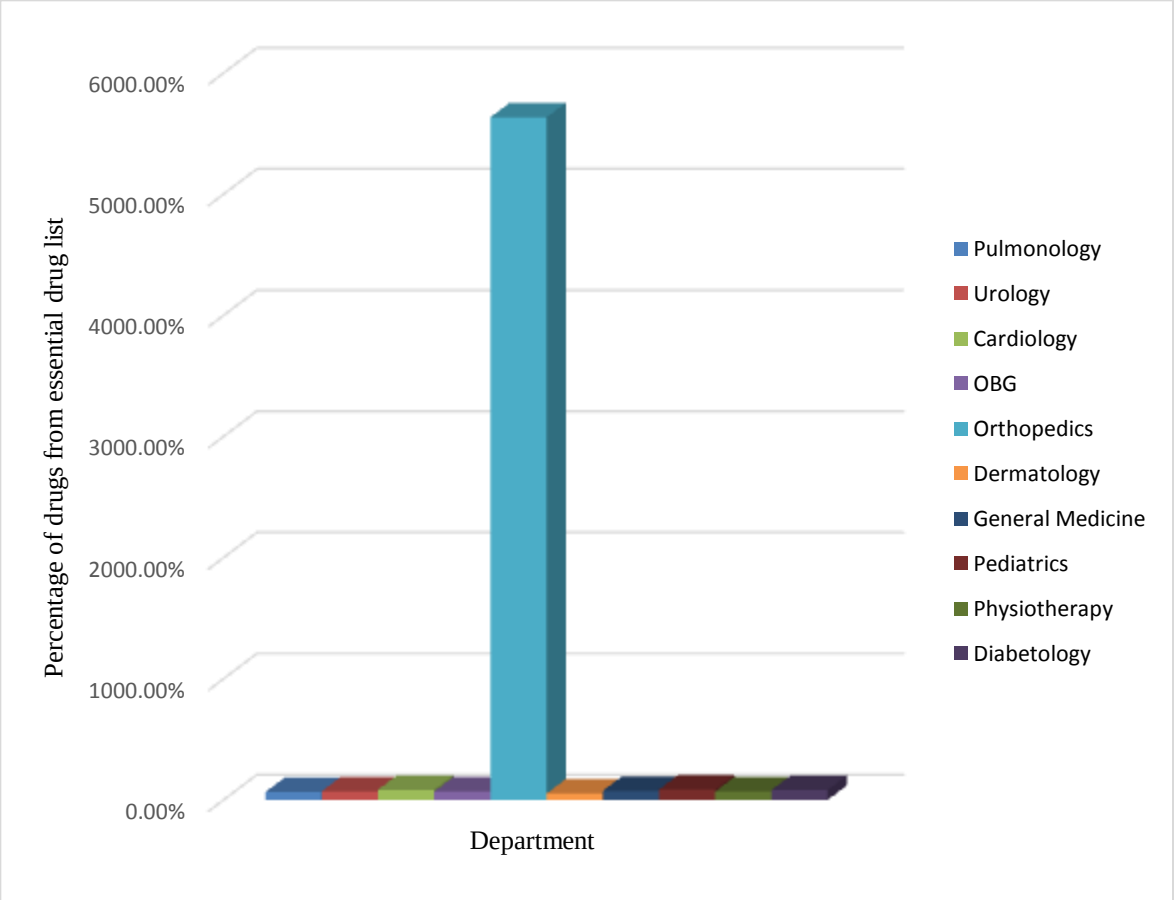

Figure 4:- Showing percentage of drugs prescribed from EDL in different departments.

Discussion:-

Prescribing practices influences the patient's compliance and there by therapeutic success or failure. The different prescribing parameters and the distribution of different categories of drugs in the prescriptions analyzed in this study provided an insight into the prescribing behavior of physicians. World health organization developed a core prescribing patterns to measure the degree of polypharmacy, the tendency to prescribe drugs by generic name and the overall level of use of antibiotics and injections. The degree to which the prescribing practice conformed to the essential drug list, formulary or standard treatment guideline were also measured by searching for the number of drugs prescribed from essential drug list for children of India.

The WHO prescribing indicators have provided a reproducible and objective measure of characterizing prescriptions by clinicians. This study reveals areas of irrational prescribing that need to be addressed with intervention programs.

The WHO guidelines on rational use of drugs for the average number of drugs per encounter had reference values of (<=3) drugs per encounter, where it was found to be pulmonology [4.53drugs], urology [1.23 drugs], cardiology [3.28 drugs], OBG [3 drugs], orthopedics [5.69 drugs], dermatology [3.07 drugs], general medicine [7.61 drugs], pediatrics [6.76 drugs], physiotherapy [2.23 drugs] and diabetology [2.69 drugs]. These results clearly indicate that in this study the average number of drugs per encounter was comparatively high. It was very high in general medicine[8.37 drugs] and pediatrics [6.76 drugs] departments. It was somewhat low in orthopedics [5.69 drugs] department.

A high number of drugs prescribed to a patient increases the risk of drug interactions, affects compliance, reduction in quality of drug therapy, wastage of resources, increased cost of therapy, emergence of resistance, and increased adverse reactions. A relationship has been described between polypharmacy and chronic polypharmacy – the prescription of multiple medicines in itself a predisposing factor to adding further drugs. Studies have also shown a

clear relationship between polypharmacy and under prescribing, a situation in which an indicated drug was not prescribed even as no reasons could be found for not prescribing it. The probability of under prescription increases significantly with number of medicines.

In this study the percentage of drugs prescribed by generic names varies for each department as pulmonology [11.86%], urology [5.4%], cardiology [8.8%], OBG [12.8%], orthopedics [0.82%], dermatology [7.5%], general medicine [20.20%], pediatrics [14.77%], physiotherapy [1.31%] and diabetology [25.71%] where the WHO reference range is 100%. WHO expects 100% prescription of drugs in generic name but results obtained in the study are not in par with the WHO reference range. Among these departments diabetology [25.71%] has shown the highest percentage of generic drugs prescribing where orthopedics [0.82%] and physiotherapy [1.31%] were least in prescribing with generics.

Increasing generic prescribing could substantially reduce the cost of drugs for the patients and reduce cost for pharmacies. Low generic prescribing could also add to the confusion of patients who are already faced with the burden of polypharmacy. This could lead to duplication errors where patients may unknowingly take the generic and brand name. Generic prescribing is an indicator of prescribing quality and the cost of prescribed medications can determine the level of compliance.

In this study the percentage of encounters with antibiotics prescribed was found to be pulmonology[42%], urology [47.21%], cardiology [15%], OBG [22.14%], orthopedics [10%], dermatology[20.31%], general medicine [36%], pediatrics [14.52%], physiotherapy[7.81%], diabetology[2%].where the reference range of WHO is [<=30%]. It is interesting to note that the encounters with antibiotics for most departments are in the range of WHO reference value, but it was very high in urology [47.21%] department and high in general medicine [36%], and OBG [22.14%]. In all other departments appropriate use of antibiotics was appropriate.

The percentage of encounters with injections prescribed in the study was found to be pulmonology[8.54%], urology [0.25%], cardiology [4%], OBG [8.76%], orthopedics [7.19%], dermatology[0%], general medicine [16%], pediatrics [5.65%], physiotherapy[3.83%], diabetology[12.3%]. The reference range of WHO was [<=10%]. The use of injections in diabetology [12.3%] department was very high and not in range. In all other departments the use of injections was appropriate.

The percentage of drugs prescribed from essential drug list was [EDL 2013] as follows, it was found to be pulmonology[66.43%], urology [72%], cardiology [85%], OBG [69.7%], orthopedics [56.3%], dermatology[53.1%], general medicine [76%], pediatrics [87.1%], physiotherapy[70.17%], diabetology[82%] whereas the optimum reference range is [100%]. The percentage of prescribing from EDL was more optimum in pediatrics [87.1%] where as it is very least in orthopedics [56.3%] department. This may be due to lack of awareness of essential drug list.

The usage of vitamins supplements, calcium and iron supplements, antacids [PPI's], antiemetics, analgesics and antipyretics was also high in this study.

Conclusion:-

On the basis of the finding of this study, the prescribing practices for generic prescribing and injection shows deviation from the standard recommended by WHO. These two commonly overused and costly forms of drug therapy need to be regulated closely. Drug use evaluation should be done for some of the antibiotics to check whether they were appropriately prescribed or not. On the other hand, polypharmacy, antibiotics and prescribing from EDL were not found to be a problem in this study.

Several activities have proved useful and effective in promoting Rational Drug Use (RDU) and should be recommended for general use. These are standard treatment guidelines; essential drug lists; establishing drug and therapeutic committee; problem-based basic training in pharmacotherapy; targeted continuing education; availability, accessibility, and affordability of drugs of a good standard; drug information centers; drug use evaluation and drug bulletins. Care is, of course, necessary to implement and ensure success.

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