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Assessment of drug utilization in gastrointestinal motility disorders using ATC/DDD Index of WHO at a tertiary care hospital

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Abstract:
Introduction: according to world health organization (WHO), ATC refers to anatomical, therapeutic and chemical name of the drug. WHO introduced the concept of DDD which refers to assumed average maintenance dose per day for a drug used for its main indication in adults.
Objective: This study will help in auditing the prescription at the department of medicine and also help in pharmacy unit for indenting purpose.
Materials and Methods: A retrospective observational study was done at the tertiary care hospital where in 400 medical records were analyzed over a period of 3 months. DDD/100 bed days were calculated using DDD of known ATC drug. WHO prescription indicators were also evaluated.
Results: Using 400 medical records social demographic data was analysed.. The average number of drugs per prescription was about 12 during hospitalization and 9 during discharge. 90% of the drugs prescribed were by generic name.40% of prescriptions included antibiotics
Conclusion: almost all drugs prescribed were from essential drug list. A welcoming observation was that 90% of drugs were prescribed in generic name. on observation, over use of metronidazole which is a major concern. Polypharmacy was observed which cannot be avoided. Appropriate prescription writing was observed.
Keywords: *Gastrointestinal motility disorders, ATC (Anatomical, therapeutic and chemical classification),DDD (Defined daily dose), ORS (Oral rehydration solution), WHO (world health organization).*

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I. Introduction

Drug consumption can be analyzed on cost, number of units, number of prescriptions s=etc. these variables vary with regimens. To address this problem, WHO introduced the concept of DDD. DDD are only assigned for medicines with ATC code. Gastrointestinal disorders are one of the prominent causes of mortality and morbidity. As all the drugs[1] used to treat gastrointestinal disorders cannot be analyzed on a single platform, we have selected gastrointestinal motility disorders for study. This group includes disorders like constipation, diarrhea, vomiting, gastro esophageal reflex disorder (GERD) and abdominal colicky pain. The drugs used in this study are purgatives/ laxatives (biscodyl & lactulose) antidiarrheals (ORS, Lactic acid bacillus, Loperamide, Sporolac and Metrogyl), Antiemetics (Domperidone, Ondensetron). Drugs used to treat GERD like Pantoprazole, Sucralphate, Ranitidine) and lastly dicyclomine in treatment of abdominal colicky pain. DDD is defined as assumed average maintanence dose per day for a drug used for its maintenance indication in adults

Obligation of study:
There is deficit of research papers on drug utilization studies in gastrointestinal disorders. This study will highlight the usage of ATC/DDD index to analyze drug utilization studies.[2]
Objectives:
As mentioned in the abstract, this study will help in auditing of prescription[3] in the department of medicine and indenting purpose in the pharmacy of the hospital.

II. Material and Methods

STUDY DESIGN: A retrospective and observational study
STUDY SUBJECTS: An estimate of 400 inpatient records were analyzed over a period of three months

STUDY SETTING: A tertiary teaching care hospital in Andhra Pradesh
STUDY PERIOD:for a period of 3 months
STUDY SIZE: A total of 400 medical medical records will be studied written by physicians of department of medicine
INCLUSION CRITERIA: Case sheets of inpatients of age between 18 to 54 years in the department of medicine
EXCLUSION CRITERIA: Medical records of geriatric patients, pregnant women and lactating mothers.
STUDY METHODS: DDD/100 bed days are calculated using the formula
= number of units administered in the given period x 100
DDD x Number of study days x number of beds
DDD/100 bed days are calculated for all the 14 drugs biscodyl, dicyclomine, domperidone, lactic acid bacillus, pantoprazole, loperimide, sporolac, sucralfate, gelusil, ORS, metrogyl, lactulose, ranitidine and ondensetron.
WHO prescription indices were also studied. These include

1. Average number of drugs per prescription
2. Percentage of drugs prescribed in generic name[4]
3. Percentage of prescriptions with antibiotics[5]
4. Percentage of prescriptions with an injection
5. Percentage of drugs prescribed from essential drug list(EDL)

Statistics and analysis of data: thedata was entered in Microsoft excel and analysed for counts and percentages. the mean and standared deviation was computed for contiuous variables. Graphical representation was done where ever possible.

III. Results

Socio-demographic characteristics [6]: female patients in the study included 58% while males were 42%. Majority of the males were 25 to 55 years and females aged about 18- 50 years. Among the 400 medical records , 12 % left against medical advice. Patients hailing from rural areas was 65 % compared to urban areas. The mean length of hospital stay was about 6.6+ 3.5 days.

DRUG UTILIZATION:

Drug utilization of the following drugs was done. These include Biscodyl, Dicyclomine, Domperidone, Lactic Acid Bacillus, Pantoprazole, Loperimide, Sporolac, Sucralfate, Gelusil, ORS, Metrogyl, Lactulose, Ranitidine and Ondensetron. All these drugs are present in the essential drug list of hospital. Approximately, 780 drugs were prescribed during hospitalization and 570 drugs were prescribed at discharge. The average number of drugs per prescription was about 12 drugs during hospitalization and 9 drugs during discharge. 65% of patients were given 6-12 drugs and 30% of patients were given 13 – 9 drugs. At discharge, approximately 51 % were given 6-9 drugs.

In table 1, DDD/100 bed days for the above mentioned 14 drugs was summarized. ORS was utilized more frequently than other (62.9) followed by pantoprazole (51.2)

In table 2, the number of drugs used in gastrointestinal disorder were about 33% in the hospital and 29% at discharge. Drugs used in other disorders were about 63% in the hospital and at discharge were about 56%

In table 3, 90% of the drugs were prescribed by generic name both in hospital and at discharge. 40% of prescriptions included antibiotic at hospital and 22% at discharge. All the drugs were prescribed from the essential drug list.

TABLE:1

S.NO	ATC CODE	DRUG NAME	DDD/UNIT	ROA	CASES	DDD/100 BED DAYS
1.	A06AB02	BISCODYL	10mg	ORAL	170	26.7
2.	A03AA	DICYCLOMINE	10mg	ORAL	162	6.4
3.	A03FA03	DOMPERIDONE	30mg	ORAL	160	7.6
4.	G01AD03	LACTIC ACID BACILLUS	1 unit	ORAL	180	12.3
5.	A02B	PANTOPRAZOLE	40mg	ORAL	259	51.2
6.	A07DA03	LOPERIMIDE	10mg	ORAL	197	6.7
7.	A07FA01	SPOROLAC	1 unit	ORAL	87	4.5
8.	A02BX02	SUCRALFATE	-	ORAL	68	2.3
9.	A02AB02	GELUSIL	358/10ml	ORAL	62	2.4
10.	A07CA	ORS	1 sachet	ORAL	310	62.9
11.	G01AF01	METRONIDAZOLE	400 mg	ORAL	232	49.2
12.	AD6AD11	LACTULOSE	6.7 gms	ORAL	58	1.3
13.	A02BA02	RANITIDINE	300 mg	ORAL	232	36.7
14.	A04AA01	ONDENSETRON	16 mg	ORAL	197	20.6

ROA = ROUTE OF ADMINISTRATION

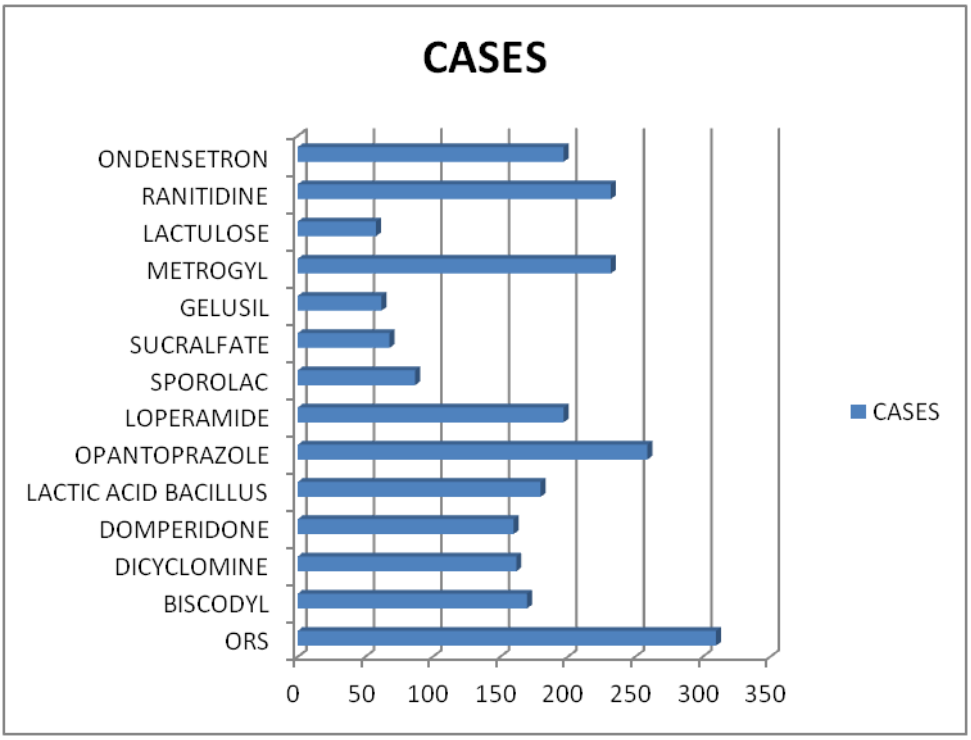
TABLE :2

Number of drugs prescribed	In hospital
Drugs used in GI disorders	37%
Drugs used in other disorders	63%

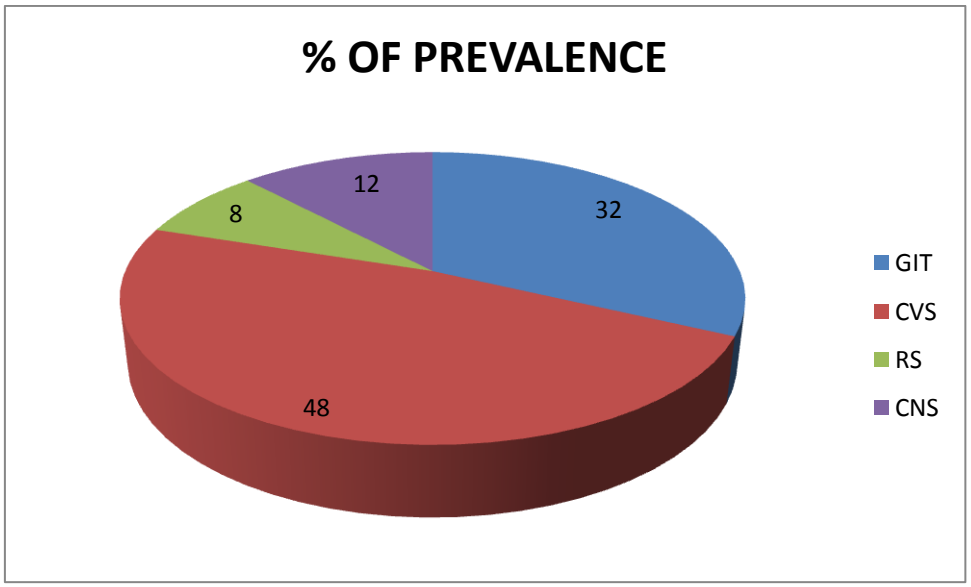
TABLE 3: PATTERN OF PRESCRIPTION WRITING USING WHO PRESCRIBING INDICATORS IN STUDY POPULATION

PRESCRIPTION INDICATORS	IN HOSPITAL	AT DISCHARGE
AVERAGE NUMBER OF DRUGS PERPRESCRIPTION	12.5	9
% OF DRUGS PRESCRIBED BY GENERIC NAME	90 %	90 %
% OF PRESCRIPTIONS WITH ANTIBIOTICS	40 %	22 %
% OF PRESCRIPTIONS WITH INJECTIONS	38 %	2 %
% OF DRUGS PRESCRIBED FROM EDL	100 %	100 %

GRAPH: 1

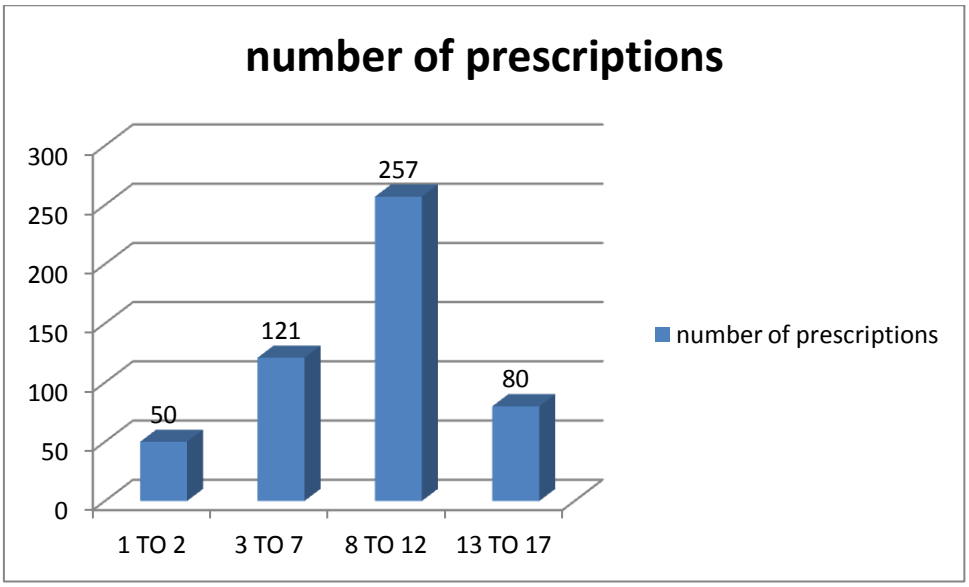


GRAPH 2



GIT: GASTROINTESTINAL SYSTEM
CVS: CARDIOVASCULAR SYSTEM
RS: RESPIRATORY SYSTEM
CNS: CENTRAL NERVOUS SYSTEM

GRAPH 3:



IV. Discussion:

On analyzing the socio-demographic data, it was found that female patients (58%) dominated the male patients (42%). Most of them were aged between 30 to 45 years. Cases from rural areas were more than the urban indicating the awareness among the rural population. Out of the clinical cases observed, diarrhea[7] was more prominent followed by vomiting[8], GERD[9], constipation[10] and abdominal colicky pain[11]. On calculating DDD /100 bed days, ORS was about 62.9 (cases 310) followed by pantoprazole 51.2(cases 259).

Antidiarrheal drugs are ORS[12], lactic acid bacillus[13], Metronidazole[14], Loperamide[15] and occasionally Pantoprazole. ORS replenishes electrolyte and water. Lactobacillus promotes growth of beneficial bacterial the gut. Metronidazole is mainly used for dysentery. Loperamide decreases GI motility. Pantoprazole is sometimes used to decrease the acidity which may be due to polypharmacy. Drugs used in colicky abdominal pain are Dicyclomine[16] which is an atropine substitute. Drugs used in constipation are Biscodyl[17] and lactulose[18].drugs used in GERD include Ranitidine[19], Pantoprazole[20], Sucralfate and Gelusil. Antiemetics include Domperidone and ondensetron which come next to usage of antidiarrheals. On analysis antibiotics were prescribed occasionally. Intravenous drugs in prescription were also rational.as all the drugs were from EDL, there was rationale drug use and cost effectiveness. Prescription errors were less

V. Conclusion

As mentioned in the results section, male patients were less than female patients suffering from GI motility disorders. Diarrhea was the leading cause of most of the GI disorders. So antidiarrheals must be indented more in the pharmacy of the hospital.as mentioned in the abstract, over usage of metronidazole is a major concern. Polypharmacy was observed which cannot be avoided. Full percent compliance in patients a=can be achieved with rationale prescription and educating the patients

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