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Prescription pattern analysis during pregnancy in a tertiary care hospital, Famagusta, north Cyprus

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Abstract---Background: Prescribing pattern in pregnancy population provide insights during drug profile and also minimizes the inherent risks due to unethical prescribing. The study aimed to evaluate the prescribing pattern of drugs among pregnant women. the irrational use of drugs is a concern for the present-day medical practice. Objectives: To evaluate and assess the FDA category drug use pattern using in pregnancy and to determine the percentages of pregnant women prone to possible teratogens, namely category C, D and X. Methodology: This was a prospective observational study at a tertiary care hospital. Famagusta, North Cyprus. All the medically relevant information was documented using a predefined data collection form and the case charts were also analyzed. Results: Drugs effecting in GIT were with the frequencies of 242 (18.5%) and it was found that the use of antibiotics and antiemetic drugs was also more common during pregnancy Out of 1333 drugs prescribed drugs according to the US FDA category is given below and 785 (58.88%) belongs to category B followed by 350 (26.25) in category A and least were in category D 4 (0.3%). Conclusions: Evaluating and assessing the prescribing pattern will minimize the teratogenicity and risk to the mother during pregnancy. the occurrence of contraindicated medicines was desirably low, thereby minimizing overall risk to the developing fetus.

Keywords---*Prescribing pattern, inherent risks, teratogens, FDA category pregnancy.*

Introduction

Medication use during the period of pregnancy becomes a major concern since the thalidomide incidence of the 1960s and the teratogenic effects of diethylstilbestrol discovered in 1971 [1]. Pregnancy care imposes a great challenge to both the health care providers and pregnant women because drug utilization during pregnancy may adversely affect the lives of the mothers and the growing fetus [2-6].

Anemia is a major health problem that affects 25% to 50% of the population of the world and approximately 50% of pregnant women. [7] Anemia in pregnancy is associated with increased rates of maternal and perinatal mortality, premature delivery, low birth weight, and other adverse outcomes. [8] During pregnancy, anemia increased more than fourfold from the first to third trimester. [9] It is a well-established fact that there is a physiological drop in hemoglobin (Hb) in the mid trimester. [10] This physiological drop is attributed to increase of plasma volume and hence decrease of blood viscosity lead to better circulation in placenta. [11] The most common cause is iron deficiency anemia, other causes include infection, folate, and vitamin B12 deficiency. [12]

Antenatal care is organized medical service including examination and advising a pregnant woman with the objective that every wanted pregnancy culminates in the delivery of a healthy baby without impairing the health of the mother. Pregnant women requiring prescription drugs pose a challenge to physicians to avoid any risk to the mother and to the fetus. Pregnancy is special physiological condition where drug treatment presents a special concern. The rationale for use of drugs during pregnancy requires a careful assessment as in addition to the mother, the health and life of her unborn child is also at stake Prescribing patterns of the drug in the pregnant women are the serious events which can have harmful effects to mother as well as fetus if administered. Also, some drugs can interfere with functional development of organ systems and the central nervous system in the second and third trimester and produce consequences. Prescribing patterns of the drug in the pregnant women includes age, commonly prescribed drugs, Co-morbidities, trimester, gravid condition, risk category.[13]

Careful consideration of the benefit to the mother and the risk to the and reducing medication errors will improve patient safety and clinical outcomes[14,15]There is a huge gap in the knowledge about deleterious consequences for the foetus, prescription drug use by pregnant women should be viewed as a public health issue [16].Regardless of the limited information on the safety of drugs in pregnancy, drug use in pregnancy is common [17]. In addition, drugs may also be prescribed for conditions not related to pregnancy such as upper respiratory infections, urinary tract infections and gastrointestinal infections to name some. Also, pregnant women are prescribed drugs to treat pre-existing chronic conditions such as diabetes, hypertension or epilepsy or to treat pregnancy related disorders such as pregnancy induced hypertension and

gestational diabetes [18]. Therefore, judicious use of drugs, adequate knowledge, positive approach and awareness towards the drug use are mandatory prerequisites for good maternal and child health [19].

Materials and Methods

A total of 180 patients were included for the study based on the inclusion/exclusion criteria. A specially designed data collection form was used to document the raw data. Pregnant women comprised of varying ages from 18 years to 40 years. Subjects varying from Gravida were studied and subjects from all three trimesters were included. The data was collected in a proforma which included the demographic details, past medication history, co-morbid conditions, lab investigation and therapeutic data including name, dose, duration and frequency of drugs. By using guidelines, the prescriptions were assessed for inappropriate dosing of drugs. Patient medical records were reviewed by student clinical pharmacists to identify if a patient was eligible to participate in the study.

Inclusion criteria:

Pregnant women comprised of varying ages from 18 years to 40 years. Subjects from varying Gravida were studied and subjects from all three trimesters were included. All pregnant women who visited greater than or equal to two times in their gestational period

Exclusion criteria:

Patients <18 years and also patients with less than 2 times visit in 270 days of pregnancy. Self-medication drugs by pregnant women, i.e. drugs taken without documented order Sheet on patient card. Topically applied drugs except ophthalmic and vaginally applied topical formulations. The patients visiting the outpatient department were excluded from this study.

Statistical analysis:

A sample of 180 patients were statistically analyzed using MS excel and the result was statistically analyzed using appropriate statistical method (MS excel)

Result

A total of 180 patients who were on Pregnancy were enrolled in the study. Out of this 91% (n=158) were rural and 9% (n=22) were urban population. More number of pregnancies was found in the age group of 21 to 25 years. Co morbidities in pregnant women in the study was given in Table-1.

Table 1: Co morbidities in pregnant women

CO MORBIDITIES	NO OF PATIENTS	PERCENTAGE
CHRONIC BRONCHITIS	1	0.55%
GASTRO ENTERITIS	1	0.55%
DIABETES MELLITUS	4	2.22%
HYPERTENSION	9	5%
HYPOTHYROIDISM	4	2.22%
UTERINE FIBROID	4	2.22%
ANAEMIA	10	5.5%
INFECTION	7	3.88%
NO COMORBIDITIES	140	77.77%
TOTAL NO OF PREGNANT WOMEN	180	100

Out of the 180 patients enrolled in the study, 38(21.11%) patients were having at least one comorbid condition while 142 (78.88%) patients were admitted on the basis of fresh complaints.

Table 2: Trimester distribution of pregnant women in each month

Trimester	No of Pregnant Women	Percentage%
1 month	5	2.77%
1.5 months	8	4.44%
2 months	10	5.55%
3 months	14	7.77%
4 months	18	10%

5 months	17	9.44%
6 months	15	8.33%
7 months	19	10.55%
7.5 months	8	4.44%
8 months	36	20%
8.5 months	6	3.33%
9 months	24	13.33%
Total NO of Pregnant Women	180	100

Out of 180 study patients included in the study majority of patients 93 (51.66%) belonged to Third-Trimester

Figure 1: Trimester distribution of patients in each month

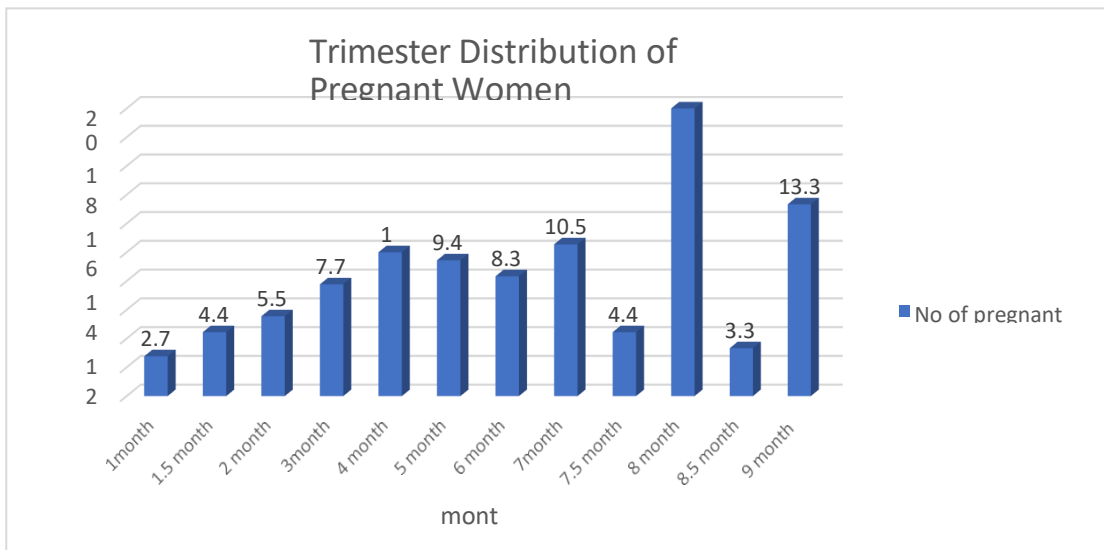


Table 3: Trimester distribution of patients (N=180)

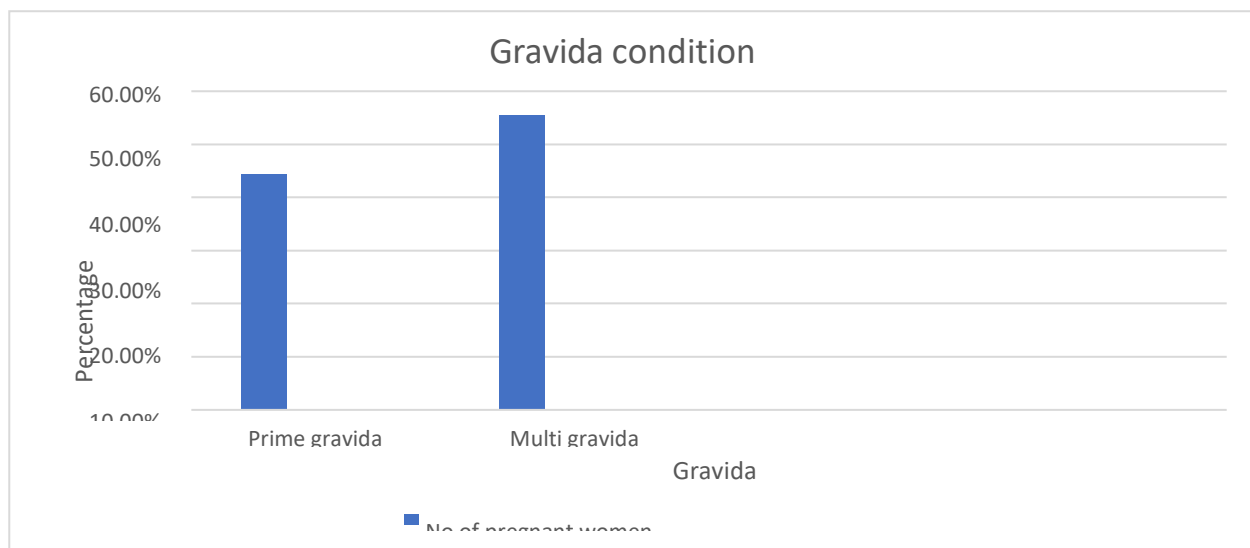
Trimester	No of Pregnant Women	Percentage %
1 st	37	20.55%
2 nd	50	27.77%
3 rd	93	51.66%
Total No of Pregnant Women	180	100

Gravida Condition Of Patients

Out of 180 study patients included in the study, majority of patients, 100 (55.55%) belonged to Multi-Gravida. The Gravida condition as shown in the table below

Table 4: Gravida condition of patients (N=180)

Gravida	No of Pregnant Women	Percentage%
Prime- Gravida	80	44.45%
Multi - Gravida	100	55.55%
Total no of pregnant women	180	100

Figure 2: Gravida Condition Of Patients**Drugs used according to the class**

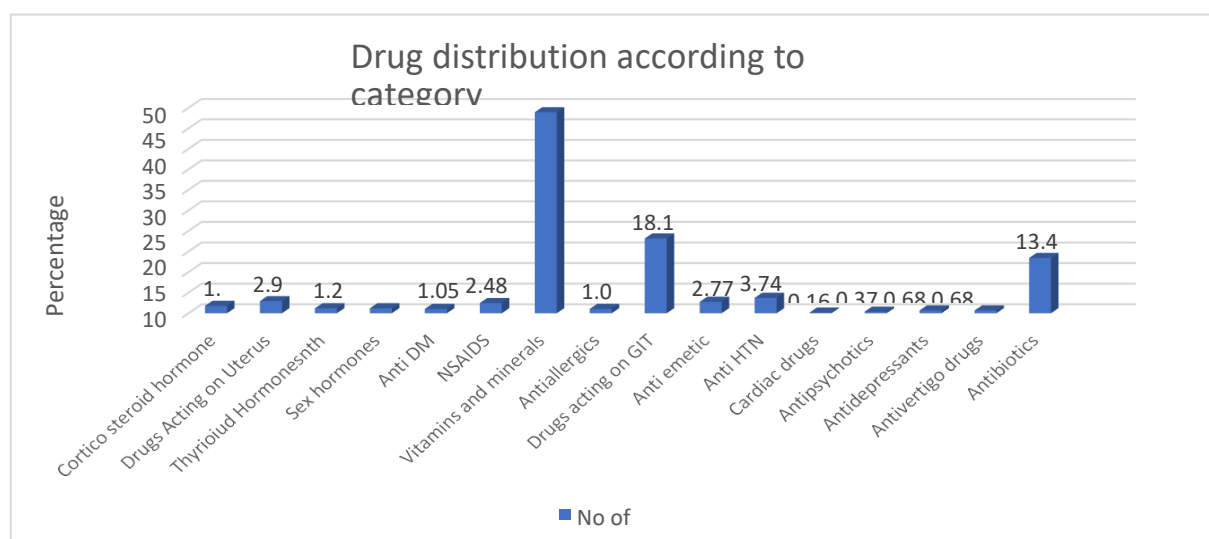
Out of all the drugs most of the drugs belong to the class vitamins and minerals 652(48.91%) followed by drugs acting on GIT 242(18.15%) then antibiotics with 179 (13.43%) and the least prescribed drugs were anti vertigo drugs.

Table 5: No of drugs according to the class

Drugs	Number	Percentage
Cortico steroid hormone	24	1.80
Drugs Acting on Uterus	39	2.93
Thyroid Hormones	16	1.20
Sex hormones	16	1.20
Anti DM	14	1.05
NSAIDS	33	2.48
Vitamins and minerals	652	48.91

Antiallergics	14	1.05
Drugs acting on GIT	242	18.15
Anti emetic	37	2.77
Anti HTN	50	3.74
Cardiac drugs	2	0.16
Antipsychotics	5	0.37
Antidepressants	9	0.68
Antivertigo drugs	1	0.68
Antibiotics	179	13.43
Total	1333	100

Figure 3: No of drugs according to the class



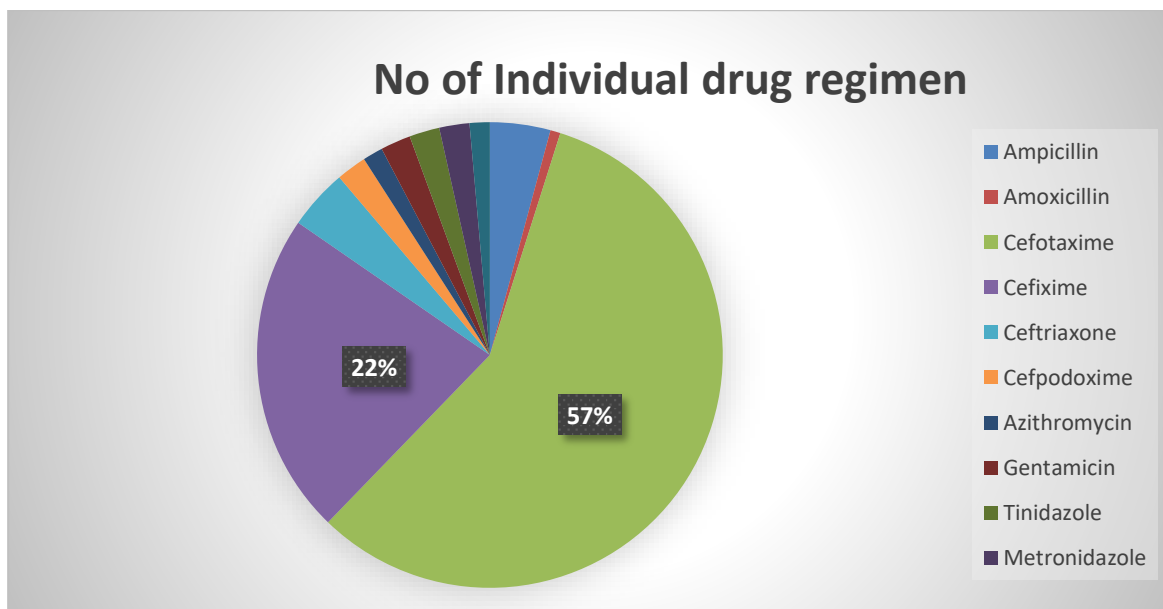
Out of 1333 drugs prescribed 172 were antibiotics out of which individual antibiotic are given below.

Table 6: Individual drug regimen

Generic Name	Group	No	Percentage%
Ampicillin	Pencilin	6	4.20
Amoxicillin	Pencilin	1	0.70
Cefotaxime	Cephalosporin	82	57.34
Cefixime	Cephalosporin	32	22.38
Ceftriaxone	Cephalosporin	6	4.20
Cefpodoxime	Cephalosporin	3	2.10
Azithromycin	Macrolides	2	1.39
Gentamicin	Aminoglycosides	3	2.10
Tinidazole	Antiamoebics	3	2.10
Metronidazole	Antiamoebics	3	2.10
Nitrofurantoin	Urinary antiseptics	2	1.39
	Total	143	100

Table 7: Combination of antibiotics used during pregnancy

Generic name	Group	No	Percentage
Ampicillin +Cloxacillin	penicilin	21	58.33
Amoxicilin+ clavulanic acid	Penicilin	4	11.11
Cefoperazone+sulbactam	Cephalosporin	9	25
Sulphadiazine+zinc sulphate	Topical antibiotics	1	2.78
Ciprofloxacin+tinidazole	antidiarrheals	1	2.78

Figure 4: Individual drug regimen

Commonly prescribed drugs in the study were mostly prescribed folic acid (96.66%) followed by Iron capsule (83.33%), calcium tablet (80%), T.T injection (79.33%), protein powder (41.33%).

Table 8: Commonly prescribed drugs in the study

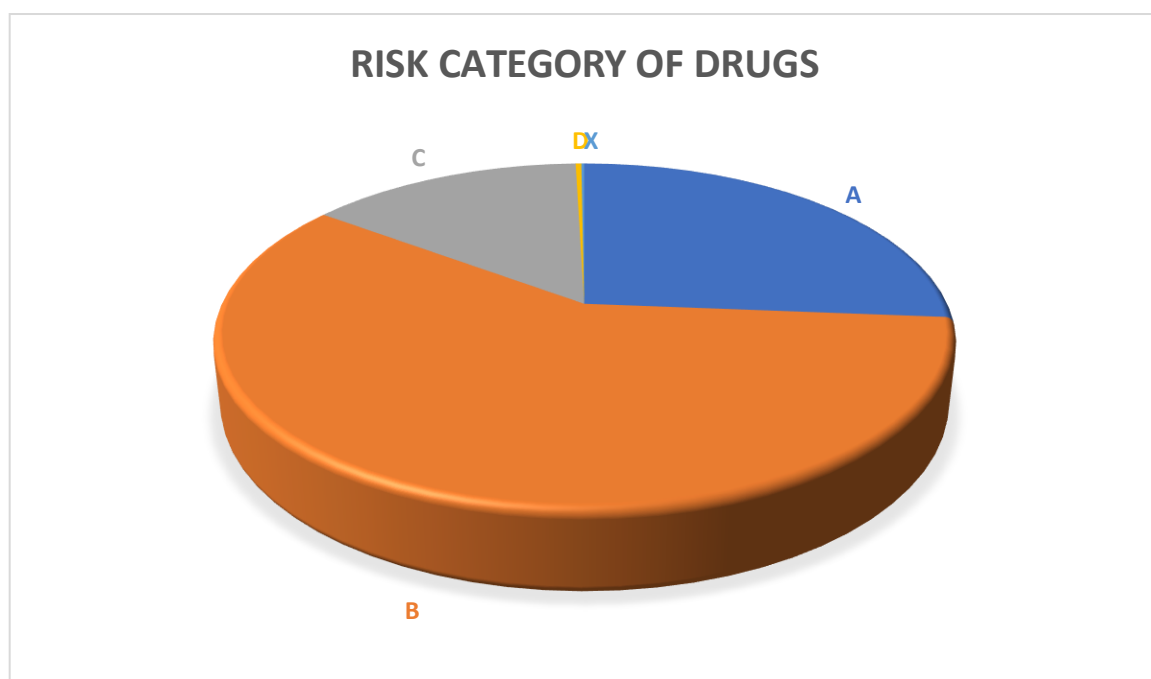
Drugs	No	Percentage%
Folic acid	145	96.66
Iron capsule	125	83.33
Protein powder	62	41.33
Calcium tablet	120	80
T. T injection	119	79.33

Out of 1333 drugs prescribed drugs according to the US FDA category is given below and 785 (58.88%) belongs to category B followed by 350 (26.25) in category A and least were in category D 4 (0.3%).

Table 9: Categorization of antibiotics according to the Pregnancy risk Categories

Category	No	Percentage%
A	350	26.25%
B	785	58.88%
C	192	14.4%
D	4	0.3%
X	2	0.15%

Figure 5: Risk category of drugs



Discussion

This study provides data on drug prescribing pattern in pregnant women in Famagusta, North Cyprus. Pregnant women comprised of varying ages from 18 years to 40 years. Subjects from varying Gravida were studied and subjects from all three trimesters were included. All pregnant women who visited greater than or equal to two times in their gestational period. The assessment of drug prescribing pattern is an important tool for clinical, educational and economic

purposes. The assessment of drug prescribing pattern aims to provide feedback to prescribers and .to create awareness about rational use of drugs.

A total of 180 patients were enrolled based on inclusion and exclusion criteria. Out of the 180 patients included in the study majority pregnant women, 68(37.77%) were in age group of 26-30 years followed by 66(36.66%) pregnant women in age group of 21-25years and 27(15%) pregnant women belonged to age groups of 31-35years, followed by 15(8.33%) in age group of 18-20 years while the least number were in the range of 4(2.22%) having above 35 years.

The present study includes 180 patients of which 40(22.22%) pregnant women were found to have Comorbidities like Hypothyroidism, chronic bronchitis, anemia, infection, Gastro Enteritis, Hypertension, DM, uterine fibroid and other medical conditions. In the present study, Anemia was found in 10(5%) pregnant women followed by HTN in 9(5%) pregnant women then infection 7 (3.88%), DM 4(2.22%), uterine fibroid 4(2.22%), hypothyroidism 4(2.22%) and 1(0.55%) of co-morbidities like-Gastro-Enteritis, Chronic bronchitis, etc. Trimester distribution of patients were seen out of 180 pregnant women studied, which the greatest number of pregnant women belongs to third trimester 93 (51.66%) pregnant women, followed by second trimester 50 (27.77%), first trimester 37 (20.55%) pregnant. Gravida condition of patients were seen out of 180 pregnant women studied, which the most number of pregnant women belongs to Multi-Gravida of pregnant women 100 (55.55%) and followed by prime-Gravida of pregnant women 80(44.44%).Gestational hypertension, gestational diabetic mellitus, hyperthyroidism, threatened abortion, urinary tract infection, vomiting, anemia, depression, psychosis, cardiac myopathy, asthma, allergic reaction, fever, back pain and gastro intestinal irritations are the some of the cases reported during pregnancy. The details of drugs group prescribed during pregnancy are shown. Folic acid, Calcium, Iron, multivitamins were the four drug classes prescribed either alone with 652 (48.91%).

Drugs effecting in GIT were with the frequencies of 242 (18.5%) and it was found that the use of antibiotics and antiemetic drugs was also more common during pregnancy. The study shows a 13.43 % use of antibiotics during pregnancy. The use of individual antibiotics during pregnancy is listed. It shows that the cefotaxime was the most commonly prescribed antibiotic during pregnancy to treat the urinary tract infection. cefixime is the third generation Cephalosporin, which is the second most common antibiotic used during pregnancy.US-FDA drugs in pregnancy were seen in 180 patients were studied, in which the most US-FDA drugs category was B category number of drugs prescribed 785 (58.88%) followed by A category number of drugs prescribed 350 (26.255%) ,C category number of drugs prescribed 192(14.4%),category D & X number of drugs prescribed 4 (0.3%) and 2(0.15%). Commonly prescribed drugs were seen in out of 180 pregnant women, in which the most commonly prescribed drug is Folic Acid number of pregnant women 145 (96.66%), followed by Iron capsule number of pregnant women 125 (83.33%), Calcium tablet number of pregnant women 120 (80%), T.T injection number of pregnant women 119 (79.33%), protein powder number of pregnant women 62(41.33%).Clinical pharmacists works directly with medical professionals and patients usually in a medical Centre like, hospital. The involvement of a pharmacist at the point of prescription of a drug by a physician

is the most effective. The time for decision-making is very important. Physicians and pharmacists can work together to have safe drug prescribing that can be complex and requires stepwise approach to ensure effectiveness, minimize further damage and prevent drug overdose.

Conclusion

A total of 180 patients were reviewed admitted in Obstetrics & Gynecology ward. The Majority of the patients belong to an age group of 26-30 years, (37.77%). About 10(5%) were found have the co-morbidity of anemia and followed by infection 7 (3.88%). No co-morbidity 140 (77.77%) were found in pregnant women. About pregnant women of 93 (51.66%) of third trimester are mostly seen and followed by pregnant women of 50 (27.776%) of second trimester and pregnant women of 37(20.55%) of first trimester. Out of 180 study patients included in the study majority of patients, 36(20%) belonged to trimester of 8 months. Gravida condition of pregnant women were seen as Multi-Gravida of pregnant women 100 (55.55%) and followed by prime-Gravida of pregnant women 80 (44.44%). Out of 180 study patients included in the study. Total number of drugs prescribed are 1333. Commonly prescribed drugs in the study were mostly prescribed folic acid (96.66%) followed by Iron capsule (83.33%) , calcium tablet (80%) , T.T injection (79.33%),protein powder (41.33%).Percentage of risk category drugs in the study were seen of D & X category of 0.3% and 0.15%.Drug-related problems can result in an increase in morbidity and mortality, as well as an increase in the cost of healthcare. Inappropriate use of medications can increase adverse drug effects that may be reflected by excessive length of hospital stay, and excessive healthcare utilization and cost. Large numbers of adverse drug reactions are predictable and often preventable. Preventable adverse drug events are often a result of medication errors. Prescribing errors often occur because the prescribers do not have immediate access to all the needed information related to the drugs or the patient. Clinical pharmacists who have developed confidence and skill in using pharmacokinetics as a clinical tool, will be able to participate in this interdisciplinary approach to individualized patient care.

Limitations:

- It was difficult to collect all the data from the pregnant women since they visit doctor every two to three months.
- Most of the pregnant women took OTC drugs..

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