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Drug Use Pattern among Pregnant Women in a Tertiary Care Hospital

[1]Dr. Kuruvila P Chacko, [2]Ms. Ashley Varghese, [3] Ms. Hanna Maria Baiju, [4]Ms. Romy Susan Thomas, [5]Dr. Philip Jacob, [6]Dr. Abel Abraham Thomas

[1]Professor, Department of Obstetrics and Gynaecology, Believers Church Medical College Hospital, Thiruvalla, India

[2*,3,4] Pharm D interns, Department Of Pharmacy Practice, Nazareth College of Pharmacy, Thiruvalla, India

[5]Assistant Professor, Department of Pharmacy Practice, Nazareth College of Pharmacy Thiruvalla, India

[6]Associate Professor, Department of Pharmacy Practice, Nazareth College of Pharmacy Thiruvalla, India

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Corresponding Author: Ms. Ashley Varghese, Department of Pharmacy Practice, Nazareth College of Pharmacy, Thiruvalla, Kerala, India

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Abstract

Background

Pregnancy is a physiological state where drug therapy is of particular concern. The appropriate use of drugs during pregnancy is beneficial as it affects not only the health of the pregnant woman but also the developing foetus. Hence this study was carried out to evaluate the drug use pattern among pregnant women in tertiary care hospital.

Methodology

A Cross Sectional Descriptive Study was carried out among 150 pregnant women for six months. Data was obtained by direct interview with the subjects and from treatment chart of subjects which were recorded in data collection form. FDA risk pregnancy category was used to analyze the drugs. The drugs were also classified according to the pharmacological classification.

Result

Majority of the subjects were under the age group of 18-28 years (50%) who also had tertiary education. Most of the subjects were at the third trimester (57%) of their pregnancy. Of the 150 pregnant women, most of them are given with progestin, followed by antibiotics, vitamin supplements, proton pump inhibitors and antidiabetic

medications. In case of combination drugs, majority of the subjects are given with calcium supplements, followed by iron supplements and with vitamin supplements. The drug was classified according to the FDA risk category as A, B, C, D, X & NA. Most of the drugs prescribed belonged to category B.

Conclusion

The drug use pattern in a tertiary care hospital was analyzed carefully and found that the drugs were given according to FDA risk category. Thus, the judicious knowledge and awareness about the drugs during pregnancy promotes better health to the mother and developing fetus.

Keywords

Drug use pattern, Pregnancy, FDA risk category, WHO prescribing indicators

Introduction

Pregnancy is defined as the carrying of one or more offspring known as a fetus or embryo inside the uterus of a female. [1] Obstetrics & Gynaecology focuses mainly in the care of women during pregnancy, childbirth and the diagnosis and management of diseases of female reproductive organs along with fetal health. It is a period that demands special care from the health care service providers. The use of drugs during pregnancy needs special attention as it can affect the mother, as well as the developing child. [2]

Pregnancy is the crucial time in a woman as the development of one or more offspring may occur. [3] This has an impact on women's physiological, psychological and psychosocial aspects of life. [4] Pregnancy period consists of 40 weeks. Medical scientist has divided this period into three trimesters. The first trimesters comprise of 0-12 weeks, followed by the second, which comprise of 13-28 week and the third for 29-40 weeks. The fetus is highly susceptible to birth defects between 3rd week and 8th week after fertilization, which is the phase of organogenesis. All major organs start developing during this period. At 9th week the embryo is referred to as a fetus. Maturation and growth primarily occur during this stage. [5]

Proper use of medications during pregnancy is an essential part of prenatal care, since it can affect not only the health of the pregnant woman but also the developing fetus, which is exposed to a wide range of adverse effects. [6]

Pregnancy presents a responsibility in pharmaceutical treatment of chronic and acute disorders and for symptom management of many complaints associated with pregnancy. [7] There are some unparalleled events, e.g., abortions, premature births and embryopathies which could be avoided by managing diabetes, infections etc. with proper treatment. [8]Pregnancy is special physiological condition where drug treatment presents a special concern[9]

A general belief among clinicians and patients existed that, developing embryos and fetuses were protected in uterus by a "placental barrier." The placental barrier was believed to shield the fetus from substances consumed by the mother in the same way the blood brain barrier (BBB) was believed to protect the brain from certain medications.[10].

Data on drug use in clinical practice presents an opportunity to identify medicines with unknown risks that are used in pregnant populations and thus Judicious use of drugs, adequate knowledge, positive approach and awareness towards the drug use are necessary prerequisites for good maternal and child health. Drugs taken by a pregnant woman reach the

fetus primarily by crossing the placenta, the same route taken by oxygen and nutrients, which are needed for the fetus's growth and development. [11]It is a common practice to prescribe supplementations such as iron, calcium, folic acid, multi- vitamins, or other nutritional substances during pregnancy to meet to the enhanced needs of mother.[12] Preconception folic-acid supplements is found to prevent most neural tube defects and other congenital abnormalities of the cardiovascular system, urinary tract and limb deficiencies. Moreover, folic-acid supplement can help in pregnancy complications like placental abruption and preeclampsia. [13] In addition, analgesics such as paracetamol, expectorants, anti emetics, antacids and antibiotics for urinary tract infections (UTI) are frequently prescribed. Pregnant women take varieties of medications, ranging from prescribed medications to over the counter (OTC) medications to self-medicate various symptoms of pregnancy such as back pain, headache, heartburn, nausea, vomiting, and haemorrhoids. [14]

Total avoidance of pharmacological treatment in pregnancy is not possible. It may be dangerous because some women become pregnant with medical conditions that require ongoing and episodic treatment. Sometimes, drugs are, therefore, essential for the health of both the entity. In such cases, a woman should talk with her physician or other healthcare providers about the risks and benefits of taking the drugs. For instance, in chronic conditions such as epilepsy, bronchial asthma, diabetes mellitus, or infectious diseases, treatment is mandatory regardless of pregnancy. In contrast, inessential products such as cough preparations, pregnancy supporting substances, high doses of vitamins, and minerals are contraindicated as their potential risks outweigh their unproven benefits. Appropriate dispensing is one of the critical steps for rational drug use, including minimizing the use of teratogenicity drugs during pregnancy. [15]

The rational use of drugs means that patients receive medicines appropriate for their clinical needs, in doses that meet their individual requirements, for an adequate period of time, and at the lowest cost to them and their community. [16] Rational drug use in pregnancy thus requires the balancing of benefits and potential risks associated with the use of the drug. The benefits of rational drug use during pregnancy are not only restricted to the recovery of maternal health, but are also helpful in the development of the fetus. [17] Thalidomide crisis in the 1960's and the teratogenic effects of use of diethylstilbestrol in 1971 led the US Food and Drug Administration [US FDA] to demonstrate safety and efficacy of any drug before it is marketed. [18]

To safe guide drug use during pregnancy, the United States (US) Food and Drug Administration (FDA) 1979 classified drugs into five categories: A, B, C, D, and X with category D and X indicating evidence of risk in pregnancy. Among them category A and category X are considered as the safest and the most teratogenic, respectively; and thus drugs of category X should not be used unless life threatening to the expecting mothers. It provides therapeutic guidance for the Gynaecologists and other Clinicians. [19]

FDA RISK CATEGORY: [20]Category A- there is no evidence of a risk in later trimesters and the possibilities on the fetal harm appears remote.Category B- Either animal reproduction studies have not demonstrated a fetal risk but there are no controlled studies in pregnant women or animal reproduction studies have shown an adverse effect

(other than a decrease in fertility) that was not confirmed in controlled studies in women in the first trimester and there is no evidence of a risk in later trimesters.Category C-Either studies in animals have revealed adverse effect on the fetus (teratogenic, embryological, or other). Drugs should be given only if the potential benefit justifies the potential risk to the fetus. Category D-There is positive evidence of human fetal risk, but the benefits from use in pregnant women may be acceptable despite the risk.Category X- Studies in animals or human beings have demonstrated fetal abnormalities, or there is evidence of fetal risk based on human experience. The drug being contraindicated in women who are or may become pregnant.

[21]Irrational use of drugs being a huge worldwide problem effect the division of pregnant population in a substantial manner. Thus, careful assessment should be done regarding drugs or medication substances especially when considering the pregnant population as it can affect both the mother and the fetus. Drug use pattern vary differently between countries as well as within the states. This study is done because a large number of drugs are available as OTC medicines and the availability of other system of treatment like Ayurveda and homeopathy is widely prevalent in Kerala. As a result of conducting this study, educational programs can be planned which will bring health care professionals can update their knowledge about the drugs that are excluded during pregnancy. Thus it helps in evaluating the drug use among the pregnant women and the possible awareness among the pregnant women and medical personnel. The study also helps in understanding– the average number of drugs used, the most common drugs used, FDA risk categories of the used drugs and the prevalent practices of self- medication. This descriptive study was undertaken to determine the drug use pattern among the pregnant women in tertiary care hospital.

Methodology

The study has been conducted among IP and OP admissions of pregnant women in the Department of Obstetrics and Gynaecology. The study was conducted at Believers Church Medical College Hospital (BCMCH), Thiruvalla. It is a Cross Sectional Descriptive Study. All patients who met the inclusion and exclusion criteria were included. The number of study subjects was 150.The study was conducted for a period of 6 months (March 2021 to August 2021).Study was initiated after obtaining approval from the Institutional Ethical Committee.

I. **Study Criteria**

Inclusion Criteria - Pregnant women who visited IP and OP department of OBG

Exclusion Criteria - Pregnant women who informed their unwillingness to participate in the study, pregnant women providing incomplete information and Gynaec, lactating women and abortion cases

II. **Source of Data:** Includes Patient Records: Current case sheet, treatment chart and Interviewing the inpatients as well as the outpatients.

III. **Study Materials:** Patient case sheets, Medication treatment chart and Data collection form

IV. **Study Procedure:** Patients were enrolled into the study, after taking their prior consent (in local language) and also by considering inclusion and exclusion criteria. All the necessary and relevant baseline information were collected on a patient data collection form (in local language). Which includes the following. Basic socio-demographic details such as age, education, occupation, place

of residence, child bearing trimester, parity, timing of 1st prenatal visit, abortion history, habits, use of herbal products, maternal chronic diseases, medications taken, medical condition before pregnancy were collected using questionnaire. Information about drug use including the generic and brand name of the drug, dose, dosage frequency and route of administration were also collected. The drugs prescribed were grouped under their pharmacological classes and under the Food and Drug Administration (FDA) pregnancy risk classification groups A, B, C, D, and X. Patient counselling for the pregnant women were given using a leaflet.

V. **Statistical Analysis:** The results were Statistical Analysed using MS Excel

Results

Table No.1: Age group of the subjects

S. No.	Age Group	Frequency	Percentage (%)
1	18-28	75	50
2	29-38	73	49
3	39-48	2	1
	Total	150	100

Among the 150 pregnant women enrolled in the study, majority of the subjects belonged to the age group of 18-28 years (50%) followed by 29-38 years (49%) and 1% of the subjects belonged to the age group of 39-48 years.

Table No.2: Stage of the pregnancy of the subjects

S. No.	Trimester	Frequency	Percentage (%)
1	First	35	23
2	Second	30	20
3	Third	85	57
	Total	150	100

Among 150 pregnant women, the most subjects were in their third trimester (57%), 23% of pregnant subjects were in their first trimester and 20% were in their second trimester.

Table No.3: Medical history of the subjects

S. No	Medical History	Frequency	Percentage (%)
1	Gestational Diabetes	22	12
2	Thyroid disorder	30	16
3	Hypertension	7	3.7
4	UTI	7	3.7
5	Anemia	6	3.1
6	Diabetes Mellitus	11	5.8
7	Pregnancy thyroid	4	2.1
8	Allergy	2	1
9	Asthma	4	2.1
10	Nephrotic Syndrome	1	0.5
11	Scoliosis	1	0.5
12	DLP	2	1
13	Sinusitis	1	0.5
14	Gestational Thrombocytopenia	1	0.5
15	Skin Disorders	3	1.5
16	Hypothyriodism	2	1
17	Hypotension	1	0.5
18	Migraine	7	3.7
19	Behcet's Disease	1	0.5
20	Allergic Bronchitis	1	0.5
21	PCOD	9	5
22	Pre-eclampsia	1	0.5
23	TDS	1	0.5
24	Trigeminal Neuralgia	1	0.5
25	Nil	63	33.3
	Total	189	100

Of 150 pregnant women in this study, 33.33% of the subjects had no medical history. From pregnant subjects with a medical history, 16% had Thyroid disorder followed by 12% with history of Diabetes Mellitus, 5.8% with Gestational diabetes, 5% with PCOD, 3.7% with Hypertension, UTI, Migraine, 3.1% with Anemia, 2.1% with Pregnancy Thyroid and Asthma, 1.5% with Skin Disorders, 1% with Allergy, DLP and Hypothyroidism and the remaining 0.5% pregnant subjects had history of Nephrotic Syndrome, Scoliosis, Sinusitis, Gestational Thrombocytopenia, Behcet's Disease, Allergic Bronchitis, Pre-Eclampsia, Trigeminal Neuralgia, TDS and Hypotension.

Table No.4: Medication history of the subjects

S. No.	Medication History	Frequency	Percentage (%)
1	Antibiotics	2	2.2
2	Aspirin	4	5
3	Progestrone	2	2.2
4	Atenolol	1	1.1
5	Carbimazole	1	1.1
6	Thyroxine	35	40.2
7	Insulin	8	9.1
8	Metformin	19	22
9	Iron Supplements	4	5
10	Nasal Inhaler	1	1.1
11	Nasal Spray	1	1.1
12	Nifedipine	2	2.2
13	Nitrofurantoin	1	1.1
14	Labetalol	1	1.1
15	Salmeterol+Fluticasone Propionate	1	1.1
16	Furosemide	2	2.2
17	Prednisolone	1	1.1
18	Flunarizine	1	1.1
	Total	87	100

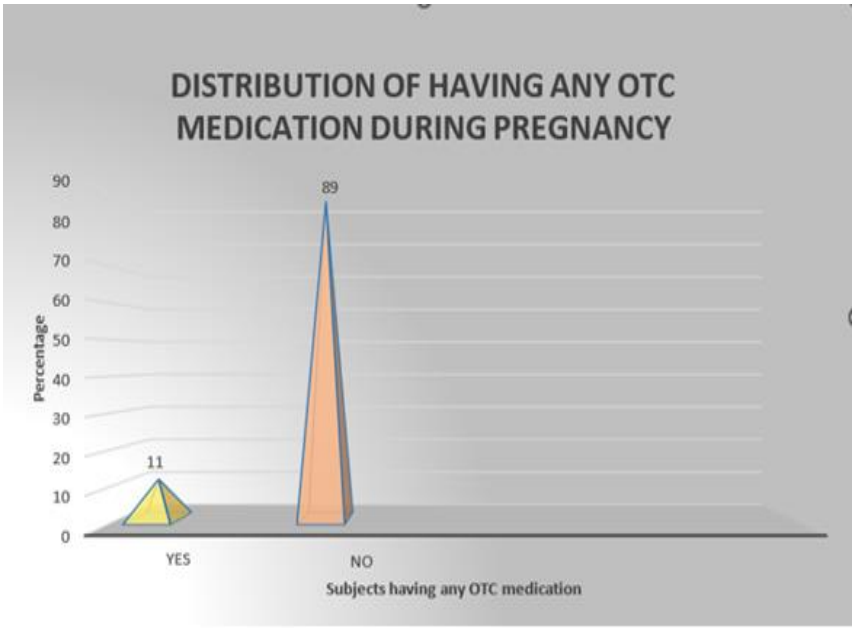
Among the 150 pregnant subjects enrolled in the study, majority of the pregnant subjects had taken Thyroxine (40.2%), followed by 22% had Metformin, 9.1% had insulin, 5% had aspirin and iron supplements, 2.2% had Progesterone, Antibiotics, Nifedipine and Furosemide, 1.1% had Atenolol, Carbimazole, Nasal Inhaler, Nasal Spray, Nitrofurantoin, Labetalol, Salmeterol+ Fluticasone Propionate, Prednisolone and Flunarizine.

Table No.5: Family history of the subjects

S. No	Family History	Frequency	Percentage (%)
1	Diabetes mellitus	83	40
2	Thyroid disorder	9	4.2
3	Hypertension	41	19.5
4	Asthma	1	0.4
5	Breast Cancer	1	0.4
6	Cancer	2	1
7	CAD	3	1.4
8	DLP	6	2.8
9	MI	1	0.4
10	TB	1	0.4
11	Nil	62	29.5
	Total	210	100

The above table demonstrates that among the 150 pregnant subjects enrolled in the study, majority of the pregnant subjects had a family history of Diabetes mellitus (40%), 29.5% of the pregnant subjects with no history, followed by 19.5% with Hypertension, 4.2% with Thyroid Disorder, 2.8% with DLP,1.4% with CAD, and remaining 0.4% with Cancer, Asthma, Breast cancer, MI and TB.

Figure No.1: Distribution of having any OTC medication during pregnancy



Among 150 subjects, majority (89%) of the pregnant women didn't have OTC drugs during pregnancy and 11% of the subjects had OTC drugs.

Table No.6: Specification of OTC medications

S. No:	Drugs	Frequency	Percentage (%)
1	Cetrizine	2	11.7
2	Paracetamol	12	70.3
3	Ranitidine	2	11.7
4	Nimesulide	1	5.8
	Total	17	100

The above table demonstrate that among the 150 study subjects enrolled in the study, commonly used OTC medication were paracetamol which is used by 64.6% of study subjects, followed by the use of cetrizine and ranitidine by 11.7% of study subjects and acetaminophen and Nimesulide were used by 5.8% of study subjects.

Table No.7: Drug Treatment Chart

S. No	Drugs	Frequency	Percentage	Category	Classification
1	Albendazole	5	1.5	C	Antihelmintics
2	Alprazolam	1	0.3	D	Benzodiazepines
3	Amanta	11	3.5	C	Crystalloid fluid
4	Amoxicillin	4	1.3	B	Antibiotics
5	Aspirin	5	1.5	D	NSAIDS
6	Azithromycin	1	0.3	B	Antibiotics
7	Betadine	3	0.9	B	Antimicrobial
8	Betamethasone	3	0.9	C	Corticosteroids
9	Bisacodyl	6	1.9	A	Laxatives
10	Calcium	5	1.5	NA	Calcium supplement
11	Cefuroxime	11	3.5	B	Antibiotics
12	Cetirizine	3	0.9	B	Antihistamines
13	Clotrimazole	4	1.3	B	Antifungal
14	CMC Eye Drop	1	0.3	B	Ophthalmic lubricants
15	Dextrose 5%	1	0.3	C	Nutrient replenisher
16	Diclofenac	2	0.6	C	NSAIDS
17	Dicyclomine	1	0.3	B	Anticholinergics
18	Dydrogesterone	7	2.3	B	Progestin
19	Enoxaparin	1	0.3	B	Anticoagulant
20	Fluconazole	9	2.9	C	Antifungal
21	Folic acid	24	7.5	A	Vitamin supplement
22	Fusidic	1	0.3	B	Antibiotics
23	Gabapentin	1	0.3	C	Anticonvulsant
24	Glycerine 5%Nacl enema	1	0.3	C	Laxatives
25	Human chorionic gonadotrophin	1	0.3	X	Hormone
26	Humanmeno pausalgonadotrophin	1	0.3	X	Hormone
27	Hydroxychloroquine	1	0.3	X	Antimalarials
28	Hydroxyprogesterone	5	1.5	B	Progestin
29	Insulin	5	1.5	B	Antidiabetics
30	Iron	6	1.9	B	Iron supplement
31	Levocarnitine	2	0.6	B	Dietary supplement
32	Lignocaine	5	1.5	B	Local anesthetics
33	Mecobalamine	1	0.3	C	Vitamin supplement
34	Medroxy progesterone	1	0.3	X	Progestins
35	Metformin	17	5.3	B	Antidiabetic
36	Metoclopromide	1	0.3	A	Prokinetic agent
37	Metronidazole	7	2.3	B	Antibiotics
38	Miconazole	2	0.6	C	Antifungal
39	Montelukast	1	0.3	B	Leukotriene receptor angonist
40	Mupirocin	3	0.9	B	Antibiotics
41	Nidafloxacin	1	0.3	C	Antibiotic
42	Nifedipine	5	1.5	C	Antihypertensive
43	Nitrofurantoin	7	2.3	B	Antibiotics
44	Norethisterone	2	0.6	X	Progestins
45	Ondansetron	4	1.3	B	Antiemetic
46	Oseltamivir	1	0.3	NA	Antiviral
47	Oxytocin	4	1.3	C	Oxytocic hormone
48	Pantoprazole	22	6.9	B	Proton pump inhibitor
49	Paracetamol	17	5.3	B	Analgesics and Antipyretics
50	Phosphate enema	3	0.9	C	Laxatives
51	Prednisolone	1	0.3	C	Corticosteroids
52	Progesterone	23	7.2	B	Progestin
53	Promethazine	5	1.5	C	Antihistamines
54	Rabeprazole	1	0.3	B	Proton pump inhibitor
55	Ranitidine	3	0.9	B	H2 receptor antagonist
56	RLS	7	2.3	C	Alkalinizing agent
57	Serratiopeptidase	16	5	X	Enzyme
58	Sucralfate	1	0.3	B	Protectants- GI agents
59	Sulfasalazine	1	0.3	B	Anti-inflammatory drug
60	Thyroxine	9	2.9	A	Thyroid hormone
61	Tinidazole	7	2.3	C	Antiparasitic
62	Tramadol	4	1.3	C	Opiate analgesics
63	Vitamin C	1	0.3	A	Antioxidant
64	Vitamin D	2	0.6	C	Vitamin supplement
65	Vitamin K	3	0.9	C	Vitamin supplement
	Total	320	100		

The above table demonstrates distribution of drug treatment chart of the pregnant women. Among the 150 subjects enrolled in the study, 7.5% had Folic Acid, followed by 7.2% had Progesterone, 6.9% had Pantoprazole, 5.3% had Paracetamol and Metformin, 5% had Serratiopeptidase, 3.5% had Cefuroxime, 2.9% had Thyroxine and Fluconazole, 2.3% had Hydrogestrone, Nitrofurantoin and Metronidazole, 1.9% had Bisacodyl and Iron, 1.5% had Hydroprogestrone, Lignocaine, Misoprostol, Promethazine, Aspirin, Albendazole, Nifedipine and Insulin, 1.3% had Clotrimazole, Oxytocin, Tramadol, Amoxicillin and Ondansetrone, 0.9% had Betamethasone, Mupiroun, Vitamin K, Betadine, Ranitidine and Cetirizine, 0.6% had Levocarnitidine, Norethisteroneand Miconazole and the remaining 0.3% had CMC Eye Drop, Rabeprazole, Prednisolone, Montelukast, Oseltamivir, Enoxaparin, Vitamin D, Fusidic, Alprazolam, Gabapentin, Dicyclomine, Hydrochloroquine, Selfarazine, Human Menopausal Gonadotrophin, Human Chorionic Gonadotrophin, Medroxyprogestrone, Letrazole, Metoclopramide, Azithromycin, Sucralfate, Vitamin C and Nidafloxacin.

Table No. 8: Combination drugs

S. No	Drugs	Frequency	Percentage %	FDA Category	Pharmacological classification
1	Activated Poly Dimethyl Siloxane + Dried Aluminium Hydroxide+ Magnesium Aluminium Silicate+ Magnesium Hydroxide	2	0.6	NA	Antacid
2	Aloe vera+ glycerine+ tocopheryl acetate	2	0.6	NA	Moisturizer
3	Aluminium hydroxide + Magnesium hydroxide + Simethicone	1	0.3	NA	Antacid
4	Amoxicillin + clavulanate	1	0.3	B	Antibiotic
5	Anti Rh D immunoglobulin	1	0.3	C	Immunoglobulin
6	Ascorbic acid + bioflavonoids.	1	0.3	A	Multivitamin
7	Bromhexine + Guaifenesin + Terbutaline + Menthol.	1	0.3	NA	Expectorant, Mucolytic agent & Bronchodilator
8	Calcium + cholecalciferol	4	1.3	NA	Calcium supplement
9	Calcium carbonate+ vitamin D3 + Iron fumarate	1	0.3	A	Vitamin supplement
10	Calcium citrate + Cholecalciferol + folic acid	19	6	NA	Calcium supplement
11	Calcium+ vitamin D3+ Magnesium+ zinc	2	0.6	NA	Calcium supplement
12	Cholecalciferol +Elemental Calcium	74	23.5	NA	Calcium supplement
13	Citric acid + sodium citrate	1	0.3	NA	Alkalizer
14	Clindamycin + Clotrimazole + Tinidazole	16	5.1	NA	Antibiotic, Antifungal & Antiparasitic
15	Clotrimazole + Betamethasone	1	0.3	B	Antifungal & Corticosteroid
16	Cyanocobalamin + ferrous fumarate+ folic acid	8	2.6	A	Vitamin & Iron supplement
17	Cyanocobalamin +Ferric ammonium citrate+ folic acid	4	1.3	C	Vitamin & Iron supplement
18	Dextromethorphan + chlorpheniramine + phenylephrine	1	0.3	C	Cough & cold preparation
19	Diclofenac + Capsaicin + Menthol	8	2.6	C	NSAID
20	Disodium hydrogen citrate	2	0.6	NA	Alkalizer

The above table demonstrated that the distribution of combination drug among 150 subjects enrolled in the study, majority of pregnant subjects had Ferrous fumarate+ folic acid+ zinc (28.5%) , followed by 23.5% had Cholecalciferol+ elemental calcium, 6% with Calcium citrate+ cholecalciferol+ folic acid, 5.1% had Clindamycin+ clotrimazole+ tinidazole, 3.9% had Vitamin B complex+ vitamin C, 3.2% had Folic acid+ mecobalamine+ pyridoxine, Doxylamine+ pyridoxine with 2.8% ,2.6% had Cyanocobalamin+ ferrous fumarate+ folic acid, Diclofenac+ capsaicin+ menthol and Maltodextrin+ sodium & calcium caseinates, 2.2% had Magaldrate+ dimethicone, 1.6% had Milk of magnesia+ liquid paraffin, 1.3% had Calcium+ cholecalciferol, Cyanocobalamin+ ferric ammonium citrate+ folic acid, 0.9% with Docosahexaenoic acid+ folic acid+ methylcobalamin+ pyridoxine and Vitamin A+ vitamin B complex+ magnesium+ iodine, 0.6% had Activated Poly Dimethyl Siloxane + Dried Aluminium Hydroxide+ Magnesium Aluminium Silicate+ Magnesium Hydroxide, Aloe vera+ glycerine+ tocopheryl acetate, Calcium+ vitamin D3+ Magnesium+ zinc, Disodium hydrogen citrate and L-Arginine + zinc sulphate and the remaining 0.3% had Aluminium hydroxide + Magnesium hydroxide + Simethicone, Amoxicillin + clavulanate, Anti Rh D immunoglobulin, Ascorbic acid + bioflavonoids, Bromhexine + Guaifenesin + Terbutaline + Menthol, Calcium carbonate+ vitamin D3 + Iron fumarate, Citric acid + sodium citrate, Clotrimazole + Betamethasone, Dextromethorphan + chlorpheniramine + phenylephrine, Doxycycline+ lactobacillus, Fluticasone + mupirocin, Heme iron polypeptide, Ipratropium bromide +Levosalbutamol, L-arginine + proanthocyanidine, Liquid Paraffin + Magnesium Hydroxide + Sodium Picosulphate, Paracetamol+ chlorzoxazone and Phenylephrine+ Beclometasone+ Lidocaine.

Table No. 9: Pharmacological classification of drugs

S. No	Classification	Frequency	Percentage (%)
1	Alkalinizing agent	7	2.1
2	Analgesic & antipyretic	17	5.3
3	Anthelmintics	5	1.5
4	Antibiotic	35	11
5	Anticholinergics	1	0.3
6	Anticoagulant	1	0.3
7	Anticonvulsant	1	0.3
8	Antidiabetic	22	7
9	Antiemetic	4	1.2
10	Antifungal	15	4.6
11	Antihistamines	8	2.5
12	Antihypertensive	5	1.6
13	Anti-inflammatory drug	1	0.3
14	Antimalarial	1	0.3
15	Antimicrobial	3	0.9
16	Antioxidant	1	0.3
17	Antiparasitic	7	2.1
18	Antiviral	1	0.3
19	Benzodiazepines	1	0.3
20	Calcium supplement	5	1.6
21	Corticosteroids	4	1.2

22	Crystalloid fluid	11	3.4
23	Dietary supplement	2	0.6
24	Enzyme	16	5
25	H2 receptor antagonist	3	0.9
26	Hormone	2	0.6
27	Iron supplement	6	2
28	Laxatives	10	3.1
29	Leukotriene receptor antagonist	1	0.3
30	Local anaesthics	5	1.6
31	NSAIDs	7	2.1
32	Nutrient replenisher	1	0.3
33	Ophthalmic lubricant	1	0.3
34	Opiate analgesics	4	1.4
35	Oxytocic hormone	4	1.2
36	Progestins	38	12
37	Prokinetic	1	0.3
38	Protective	1	0.3
39	Proton pump inhibitor	23	7.2
40	Thyroid hormone	9	3
41	Vitamin supplement	30	9.4
	Total	**320**	**100**

Among 150 pregnant women, majority of subjects are prescribed with progestins (12%), followed by antibiotics (11%) followed by 9.4% of vitamin supplements, 7.2% had proton pump inhibitor, 7% had antidiabetics, 5.3% had analgesics & antipyretics, 5% had an enzyme, 4.6% had antifungal, 3.4% given with crystalloid fluid, 3.1% had laxatives, 3% had thyroid hormone, 2.5% had antihistamines, 2.1% had NSAIDs, antiparatics and alkalizing agents, 2% had iron supplements, 1.5% had antihypertensive, anthelmintics, calcium supplement and local anaesthetics, 1.2% had antiemetic, corticosteroids, opiate analgesics and oxytocic hormone, 0.9% had antimicrobials and H2 receptor antagonist, 0.6% had dietary supplements and hormone and at last 0.3% had anti-inlammatory drugs, anticholinergics, anticoagulant, anticonvulsant, antimalarial, antioxidant, antiviral, benzodiazepines, leukotriene receptor antagonist, nutrient replenisher, ophthalmic lubricant, protective and prokinetic.

Table No. 10: Pharmacological classification of combination drugs

S. No	Classification	Frequency	Percentage (%)
1	Alkalizer	3	1
2	Antacid	10	3.2
3	Antiallergic	4	1.2
4	Antibiotic	3	1
5	Antibiotic, antifungal & antiparasitic	16	5.1
6	Antifungal & corticosteroid	1	0.3
7	Antihaemorrhoidal agent	1	0.3
8	Antihistamine & vitamin	9	2.9
9	Broncodilator	1	0.3
10	Calcium supplement	99	31.4
11	Cough & cold preparation	1	0.3
12	Dietary supplement	3	1
13	Expectorant, mucolytic agent & bronchodilator	1	0.3
14	Haematinics	1	0.3
15	Immunoglobulin	1	0.3
16	Iron supplement	90	28.6
17	Laxative	6	2
18	Moisturizer	2	0.6
19	Multivitamin	1	0.3
20	Muscle relaxant	1	0.3
21	NSAIDs	8	2.5
22	Nutritional supplement	8	2.5
23	Proton pump inhibitor & dopamine receptor antagonist	4	1.2
24	Vitamin & iron supplement	12	3.9
25	Vitamin supplement	29	9.2
	Total	**315**	

In case of combination drugs, majority of the subjects are given with calcium supplements (31.4%), followed by iron supplements (28.6%) and with vitamin supplements (9.2%), 5.1% had combination of antibiotic, antifungal & antiparasitic drug, 3.9% had combination drug of vitamin %& iron supplement, 3.2% had antacids, 2.9% had combination of antihistamine & vitamin, 2.5% had NSAIDs and nutritional supplement, 2% had laxatives, 1.2% had antiallergic and combination of proton pump inhibitor & dopamine receptor antagonist, 1% had alkalizer, antibiotic and dietary supplements, 0.6% applied moisturizer and finally 0.3% had muscle relaxant, multivitamin, immunoglobulin, hematinic, antihaemarrhoidal agent, bronchodilators, combination of antifungal & corticosteroid.

Table No. 11: FDA classification of drugs

S. No	FDA Category	Frequency	Percentage (%)
1	A	41	12.8
2	B	167	52.2
3	C	78	24.4
4	D	6	1.9
6	X	22	6.8
5	NA	6	1.9
	Total	320	100

The FDA categorization of drugs given for the 150 subjects was done. It was found that majority of drugs belongs to category B (52.2%), followed by 24.4% were category C, 12.8% category A, 6.8% were category X drugs and least prescribed (1.9%) were category D and NA drugs.

Discussion

Pregnancy care is one of the great challenges in health care systems as drug therapy protocols can affect the life of the mother and the developing child. Irrational use of drugs is a huge concern where it can lead to many serious adverse events thus appropriate monitoring of the drug intake by the pregnant subjects should be examined. In this study it is to determine drug use pattern and awareness among the pregnant population. The determination of WHO indicators and FDA risk category were also carried out and the drugs were categorised accordingly. The study population consist of 150 pregnant women from IP and OP admissions of obstetrics and gynaecology department. The study was cross sectional descriptive study. The data was collected using questionnaire and prior consent from the subjects. Thereafter patient counselling was given.

I. **Age Group** - Among the 150 study subjects of pregnant population, 50% of the subjects being pregnant were found to be in the age range of 18-28 years. Thus more number of pregnancy in these age group were found. The 49% pregnant subjects were found between the age group 28-48 years. Only 1% of the pregnant subjects were found in the range of 38-48 years. A study done by Fasalu Rahiman OM also states the increase in number of pregnancies between the age range 21-25 years were 32.5%. Decrease in the number of pregnant subjects, as the age increases gives us an insight that there will be more complications during pregnancy and sometimes the health of the child may be at stake. In this study majority of the pregnant subjects were within the reproductive age.

II. **Trimester** - Maximum number of women (57%) were in third trimester, followed by 20% in the second trimester and 23% were in the first trimester in the present study. A similar status can be seen in a study done by Kinnari B Thacker where number of pregnant subjects were more (61.2%) in third trimester and 28.8% in the second trimester. And 10% of the subjects visited during the first trimester. Mainly during the third trimester more visits are done as it is near to the time of delivery. The health of both the mother

and the developing child is taken into consideration. Most complications can also occur during this time and the drugs taken during this time should also be monitored.

III. **Medical History** - In the present study 33.33% of the pregnant subjects had no medical history. Medical history of thyroid disorder was the most (16%). Then comes subject with diabetes mellitus which was 12%. And 5.8% of the subjects with gestational diabetes.

IV. **Medication History** - In the present study medication were given the most for thyroid disorder which is thyroxine (40.2%), followed by medication for diabetes which is Metformin (22%) and 9.1% had insulin. 5% of aspirin and iron supplements were given which comes the next.

V. **Family History** - In the present study all the pregnant subjects had family history of one or more disease. Family history of Diabetes mellitus was found to be more (40%), then comes the number of pregnant subjects with no history which is 29.5% followed by hypertension of 19.5% and thyroid disorder with 4.2%.

VI. **Drug Treatment Chart** - In the present study folic acid (7.34 %), is the most seen drug in treatment chart followed by progesterone (7.03%) and pantoprazole (6.72%).

VII. **Combination Drugs** - The most seen combination drug was Livogen (28.4%) followed by Shelcal (23.3%) and CCM (6%) in the present study.

VIII. **OTC Medication During Pregnancy and The Specific Type of OTC Medication Taken** - In the present study only 11% of the pregnant subjects took OTC medications during their pregnancy, and 89% of them did not take any OTC medications. And the most taken medication were paracetamol (64.6%), cetirizine (11.7%) and ranitidine (11.77%). This is similar to a study done by Gwenny MPJ Verstappen where only 12.5% of the subjects took the OTC medication and the most commonly reported medications were analgesics (27.3%), followed by (prenatal) vitamins and medication for the gastro-intestinal tract (26.7%). Total avoidance of the OTC medication is not possible, because for minor aliments the subjects try to take OTC medications. Most of the subjects were educated for which when asked about their OTC medication was very well versed in it. Thus the most common medication taken as OTC during pregnancy were analgesic and gastro intestinal agents. These produce no serious side effects.

IX. **FDA Risk Category** - The drugs were also categorized according to the FDA risk category. In case of the single drugs given, 41% were category A, 16% were category B, 78% were category C, 6% were category D and 22% were category X. In case of combination drugs, 53% were category A,11% were category B, 16% were category C, 1% were category D and 0% were category X according to a study done by Adefolarin A Amu Most prescribed drugs fell under category A (64.9%) and the following category B (27.3%).

X. **Pharmacological Classification** - The drugs given to 150 pregnant women were also analyzed using pharmacological classification. Of the 150 pregnant women, most of them are given with progestin, followed by antibiotics, followed by vitamin supplements, proton pump inhibitors and

antidiabetic medications. Many other agents such as analgesics & antipyretics, calicium supplements, iron supplements, nutritional supplements, etc are also given. In case of combination drugs, majority of the subjects are given with calcium supplements, followed by iron supplements and with vitamin supplements. Other agents such as antibiotic, antifungal & antiparasitic, NSAIDs, nutritional supplements, etc were also given.

Conclusion

Prescribing of drugs among pregnant population is a concern. A total of 150 pregnant women were reviewed. Majority of the subjects were in 18-28 age group (50%). About 57% of subjects were in third trimester of pregnancy. Major co-morbid condition was thyroid disorder (16%), followed by diabetes. 33.3% pregnant subjects from the 150 subjects had no co-morbidity. Hence majority of medication history included thyroxin (40%) followed by anti-diabetic medicines (31.1%). The drugs prescribed were classified according to pharmacological classification. Progestins and nutrient supplements were mostly prescribed. It is also essential to find the FDA risk category of drugs that can helps in improving the prescription pattern. For which most of the prescribed drugs were category B. All the drugs were prescribed from essential drug list and hospital formulary. Hence occurrence of poly-pharmacy is avoided.

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Abbreviations

OBG	Obstetrics And Gynaecology
ANC	Antenatal Care
US FDA	United States Food and Drug Administration
WHO	World Health Organisation
OTC	Over The Counter
IP	Inpatient
OP	Outpatient
NSAIDS	Nonsteroidal Anti-Inflammatory Drugs
CYP	Cytochromes P450
UTI	Polycystic Ovarian Disease.
DLP	Testoterone Deficiency Syndrome
PCOD	Coronary Artery Disease
TDS	Testoterone Deficiency Syndrome
CAD	Coronary Artery Disease
MI	Myocardial Infraction
TB	Tuberculosis
CCM	Calcium Citrate Malate With D
CMC	Carboxy Methyl Cellulose
BBB	Blood Brain Barrier
PPI	Proton Pump Inhibitors