



Research Article

Study of drug utilization pattern in the department of obstetrics and gynecology

Perasani Umarani*¹, Fereshteh Makiabadi¹, Rajeswari.K², Dr.Jayashree A K³

¹Pharm. D, Krupanidhi College of Pharmacy, Chikkabellandur, Carmelaram Post, Varthur Hobli, Bangalore-560035.

²Assistant Professor, Department of Pharmacy Practice, Krupanidhi College of Pharmacy, Chikkabellandur, Carmelaram Post, VarthurHobli, Bangalore-560035.

³Dr. Jayashree A K, Professor& HOD, Department of Obstetrics and Gynecology, M.V.J Medical College and Research Hospital.

Received 06 April. 2017; Accepted 05 May 2017

ABSTRACT

Objective: To assess the drug utilization pattern of drugs in the department of obstetrics and gynecology at tertiary care Hospital. **Materials and Methods:** A prospective observational study on drug utilization pattern was done in the department of obstetrics and gynecology of a 950 bedded tertiary care teaching hospital in Bangalore for a period of 6 months. Patients satisfying inclusion criteria were enrolled after obtaining Informed consent. Patient's data entered into case report form (CRF). Medication orders were observed for drug utilization Pattern. WHO prescription indicators was used to study the prescription pattern. **Results:** A total of 120 cases were enrolled. A total of 1004 drugs were prescribed which included 244 (24.30%) minerals and vitamin supplements, 219 (21.81%) antibiotics, 146 (14.55%) gastric acid secretion inhibitors, 108 (10.75%) analgesics, 35 (3.49%) antihypertensive drugs, 22 (2.19%) antifungal drugs, 32 (3.19%) anti diabetic drugs, 32 (3.19%) antispasmodics, 41 (4.08%) antiemetic drugs, 12 (1.19%) corticosteroids, 16 (1.59%) anticonvulsant drugs, 97 (9.66%) in the category of others: antiseptics, topical agents, oxytocic, antihyperlipidemic drugs, oral contraceptives etc. Average number of drugs per encounter 8.36, Drugs prescribed by generic name 17.03%, antibiotics prescribed per encounter 21.81%, number of injections per encounter 39.74%, number of drugs from essential drug medicine list 79.08%. **Conclusion:** Minerals and vitamin supplements are the most frequently prescribed drugs. Overall drug use pattern is rational with few exceptions like polypharmacy. Majority of drugs were prescribed as per FDA category A the safest Category during pregnancy. This type of study can help in evaluating the existing drug use pattern and in planning appropriate interventions to ensure rational drug therapy.

Keywords: Prescription pattern, Rational Drug use, Obstetrics and Gynecology

Introduction

Drugs play an important role in improving human health and promoting well-being. Therefore judicious use of drugs, adequate knowledge, positive approach and awareness towards the drug use are mandatory prerequisites for good maternal and child health.^[1]

Gynaecological problems are among the most considerable illnesses in women population which leads to several other complications.^[2] Pregnancy is a special physiological condition where drug treatment presents a special concern because physiology of pregnancy affects the pharmacokinetics of medications used and certain

medications could cause harm to the foetus due to the potential teratogenic effects of the drug.^[3,4] Thalidomide, prescribed for anxiety, insomnia and as an anti-emetic drug in pregnancy, turned out to cause phocomelia and other congenital anomalies in thousands of children exposed in utero.^[5]

Self-medication, medical advice from layperson or suggestions by pharmacists related to the treatment of various ailments is prevalent in developing countries. In pregnant woman, such an unsafe practice may lead to harmful effects on the fetus.^[6] Moreover in India, due to easy availability of drugs associated with inadequate health care services, increased proportions of drugs are used

as self-medication as compared to the prescribed drugs.^[7] Hence, these consumers always face the threat of adverse drugs reactions and drug interactions between active ingredients of both herbal and allopathic drugs.

Presently drug utilization studies are in evolving era, to estimate disease prevalence, drug expenditures, appropriateness of prescriptions and adherence to evidence based recommendations.^[8] It becomes essential to assess the drug utilization pattern in pregnancy for scope of improvement in the current prescribing practices.^[9] Due to harmful prospects and the death of safety information for many medicines in pregnancy, prescription drug use is addressed with caution in pregnant women by their health care providers. By identifying the medications used repeatedly with unknown potential risks it may help in organizing priorities for epidemiological research.^[10]

Irrational use of drugs is a huge worldwide problem and extra care should be taken especially in pregnancy, for example unnecessary drugs are sometimes prescribed like multivitamins in large quantities for patient without nutritional problems^[11] or antibiotics, for patients without evidence of bacterial illness.^[12] In order to be rational, drug use must be effective, safe, prescribed for the proper therapeutic indication and the correct dosage in an appropriate formulation, easily available and of a reasonable cost.^[13]

The rational use of drugs requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time & at the lowest cost to them & their community.^[14] The rational use of drugs depends upon three perspectives namely patient, physician & healthcare provider perspective. The drug use indicators recommended by WHO cover all three perspectives.^[15] These indicators may be used to study & analyse the pattern of drug use in any hospital based setting. The periodic evaluation of prescriptions can be a good tool to evaluate the rational use of drugs in terms of prescribing and dispensing and to evaluate patient understanding regarding drug usage. Hence this was carried out to study The Drug Utilization Pattern in the

Department of Obstetrics and Gynaecology in a Tertiary care teaching Hospital.

MATERIALS & METHODS

4.1 STUDY DESIGN: Prospective-Observational Study

4.2 STUDY PERIOD: 6 months

4.3 STUDY POPULATION: All OBG department inpatients receiving any category of drug therapy

4.3.a: Inclusion Criteria: All OBG department inpatients, receiving any category of drug therapy

4.3.b: Exclusion criteria: Those patients who are not willing to take part in the study

4.4 STUDY SITE: Department of Obstetrics and Gynaecology in MVJ Medical College and Research Hospital, Hoskote, Bangalore, South India

The Hospital is unique and well known for its services to the people from various parts of the city. The institution excels in diverse specialities like Medicine, Paediatrics, Dermatology, Psychiatry, Respiratory medicine, Surgery, Orthopaedics, Obstetrics and Gynaecology(OBG), Ophthalmology, Ear Nose Throat(ENT), Anaesthetics. The Hospital is well equipped with super specialities like Urology, Plastic Surgery, Faciomaxillary Surgery, Cardiology and Endocrinology.

4.5 HUMAN ETHICAL CLEARANCE: Human Ethical Clearance (Central Research/MVJ MC& RH/01/2016)(Annexure I) was obtained from Ethical Committee of the study Hospital

4.6 STUDY METHOD: The study was conducted in inpatients who were admitted in the OBG of 950-bed multispecialty tertiary care teaching hospital located in Hoskote, Bangalore. All patients admitted in the OBG were observed. Patients satisfying the Study Inclusion Criteria were enrolled after taking Informed Consent (IC) (Annexure II). A thorough review of patient's medication charts was done to understand the prescription pattern

- The basic demographics, medication related details and laboratory investigation values will be collected by the researchers personally using the Case Report Form (CRF) (Annexure III).

- All the medication orders will be observed and evaluated for legibility, the use of Generic names, route of administration, dose, frequency of administration, and allergic status in medication chart using Micromedex drug database and other standard references.
- WHO Prescription indicators will be used to study the number of drugs per encounter, percentage of drugs prescribed by generic name, percentage of encounters with an antibiotic, percentage of encounters with an injection, percentage of drugs prescribed from the essential drug list (National List of Essential Medicines).
- Patients will be reviewed and observed for their prescribing pattern of individual problems and its outcomes, after drug therapy from the date of starting treatment.

The medication charts assessed for-

1. Assessing medications prescribed with WHO prescribing indicators
2. Assessing all the medication orders for legibility, the use of generic names, route of administration, dose, frequency of administration and allergic status in medication chat using Micromedex drug database and other standard references.
3. Assessing, the percentage of drugs prescribed from essential drug list using WHO, Essential List 2013

RESULT & DISCUSSION

A Prospective Observational study was conducted for a period of 6 months, collected a total of 120 cases in the department of Obstetrics and Gynaecology (OB-GYN) of a tertiary care hospital.

During the study, cases were observed and collected by going to the patient bed side and the

cases collected mostly pregnancy with different trimesters, pregnancy induced Hypertension, urinary tract infections, Gestational diabetes, abortion cases, pelvic inflammatory disease, ovarian cysts, Premature menopause, Mass per abdomen.

As per age categorization, it was observed that the patients mainly enrolled were above 18 years of age and were admitted for their different gynaecological problems.

The cases ranged across various reasons like pelvic inflammatory disease, pregnancy for safe confinement, ovarian cysts, fever during pregnancy, urinary tract infections. Their hospitalization varied from a period of 4-10days on an average. Almost all of them were completely recovered.

Prescription pattern were reviewed and analysed for the patients enrolled in the Inclusion Criteria.

Commonly used Essential medications in the OB-GYN were listed as per EML-2015.

A total of 1004 drugs were prescribed which included 244 minerals and vitamin supplements, 219 Antibiotics, 146 Gastric acid Secretion Inhibitors, 108 Analgesics, 35 Antihypertensive drugs, 22 Antifungal drugs, 32 Anti diabetic drugs, 32 Anti spasmodic, 41 Antiemetic drugs, 12 Corticosteroids, 16 Anticonvulsant drugs, 97 in the Category of "Others": Anti septic, Topical agents, Oxytocic, Anti hyperlipidemic drugs, Oral contraceptives etc.

Table 13 gives the details about Anticonvulsants prescribed, where Benzodiazepine 10 (62.5%), Hydrations- 2 (12.5%) and Miscellaneous-4 (25%)

Table 1: AGE CATEGORIZATION (N=120)

AGE(years)	No of patients (N=120)	Percentage (%)
18-30	92	76.66
31-40	10	8.33
41-50	14	11.66
>50	4	3.33

Table 1 shows the Age Categorization, where the majority of the patients were age between 18 to 30 years (76.66%) which is in accordance with the prospective study by Sharma RS (2006)^[16], followed by 31-40 (8.33%), 41-50 (11.66%),>50 (3.33%).

Table 2: PRESCRIPTION PATTERN (N=120)

Prescription pattern	No of cases	Percentage(%)
Minerals/Vitamins	102	85
Antibiotics	100	83.33
Analgesics	83	69.16
Gastric acid secretion inhibitors	107	89.16
Anti-Hypertensive	28	23.33
Antifungals	18	15
Anti-emetics	34	28.33
Anti-diabetics	19	15.83
Antispasmodics	28	23.33
Anticonvulsant	10	8.33
Corticosteroids	12	10
Others	72	60

Table 2 shows prescription pattern for 120 cases of which Gastric acid Secretion Inhibitors were found in 107 prescriptions (89.16%) followed by Minerals and Vitamin supplements in 102 prescriptions (85%). Antibiotics in 100 (83.33%) prescriptions, Analgesics in 83 (69.16%) prescriptions, Antiemetic in 34 (28.33%), Anti-hypertensive and Anti spasmotic drugs in 28 (23.33%) prescriptions, Anti-fungal drugs in 18 (15%) prescriptions,

Corticosteroids in 12 (10%) prescriptions and others (Topical agents, Oxytocic, Oral contraceptive and Anti septic etc. found in 72 prescriptions about 60%.

*Others: intravenous fluids, antiseptics, Tetanus toxoid, Anti Cholinergic, oral contraceptives, Anti allergics, Hypolipemic drugs, topical ointments.

Table 3: PRESCRIPTION PATTERN (N=1004)

Prescription pattern	No of Drugs	Percentage (%)
Minerals/Vitamins	244	24.30
Antibiotics	219	21.81
Analgesics	108	10.75
Gastric acid secretion inhibitors	146	14.55
Anti-Hypertensive	35	3.49
Antifungals	22	2.19
Anti-emetics	41	4.08
Anti-diabetics	32	3.19
Antispasmodics	32	3.19
Anticonvulsants	16	1.59
Corticosteroids	12	1.19
Others	97	9.66

Table 3 gives details of prescription patterns of which Minerals/Vitamin supplements 244 (24.30%) are the highest prescribed followed by Antibiotics 219 (21.81%), Gastric acid Secretion Inhibitors 146 (14.55%), Analgesics 108 (10.75%). The group Others comprising of Anti septic,

Topical agents, Oral contraceptives, Oxytocic etc about 72 (60%).

*Others- protein powder, povidine iodine, thyronorm, progesterone, ethyl estradiol, thrombophob, citirizine, Tetanus toxoid, Fenofibrate, hepatoglobulin, Oxytocin, Pheneramine maleate.

Table 4: CLASSES OF ANTIBIOTIC (N=219)

Class	No of Antibiotics	Percentage (%)
Cephalosporin's (cefixime, ceftriaxone)	111	50.68
Penicillin's (Amoxicillin)	12	5.48
Amino glycoside (Nitrofurantoin, Gentamycin)	12	5.48
Fluroquinolones (Ofloxacin)	14	6.39
Nitroimidazoles (Metronidazole)	68	31.05
Fixed dose combi: Cotrimoxazole (Sulphamethoxazole+ Trimethoprim)	2	0.91

Table 4 is the classes of Antibiotics prescribed among which Cephalosporin's (50.68%) 111 drugs is the highest, followed by Nitroimidazole's (31.05%), Fluroquinolones (6.39%) 14, Aminoglycoside's (5.48) 12, Penicillin's (5.48) 12 drugs were prescribed.

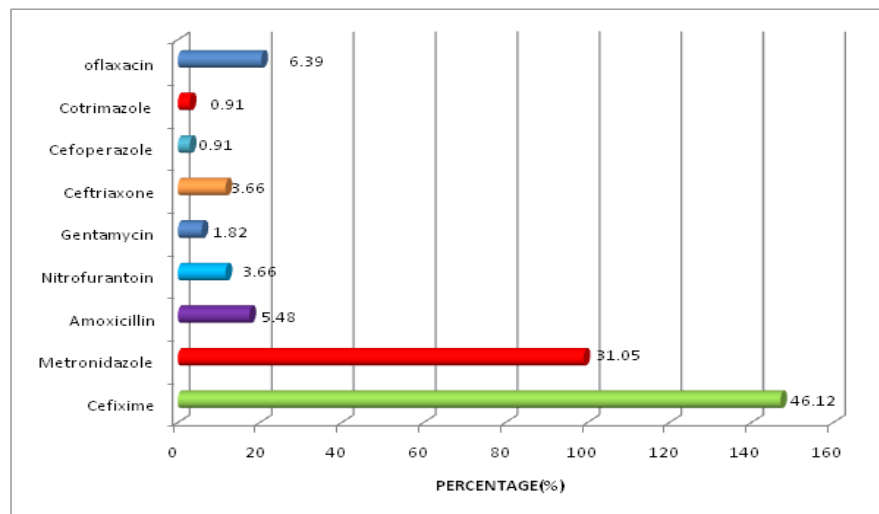


Figure 1: INDIVIDUAL ANTIBIOTICS PRESCRIBED (N=120)

Figure 1 shows the prescription pattern of individual Antibiotics prescribed among which cifixime (46.12%) is the most frequently prescribed antibiotic followed by metronidazole (31.05%), ofloxacin 6.39%, Amoxicillin 5.48%, nitrofurantoin and ceftriaxone are with 3.66%, gentamycin 1.82%, cotrimazole and cefoperazone are least prescribed 0.91%.

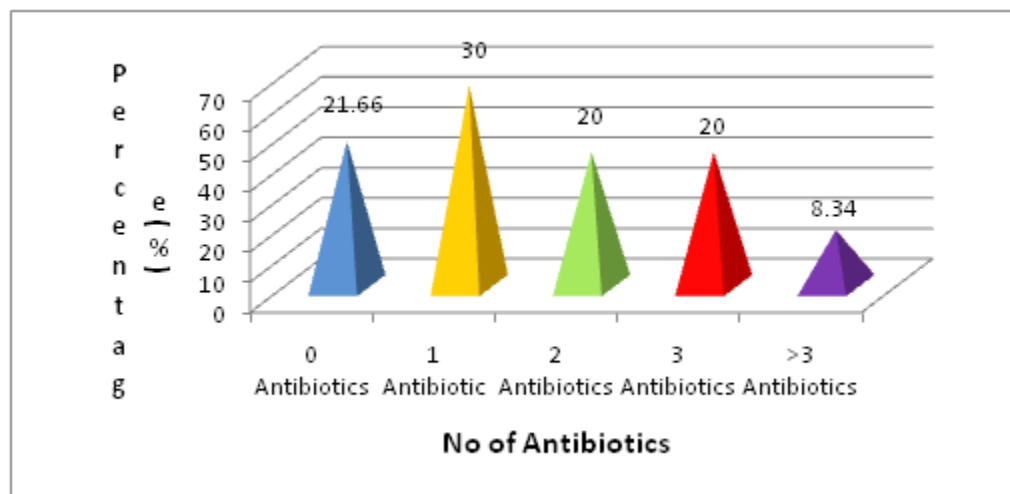


Figure 3: ANTIBIOTIC PER PRESCRIPTION (N=120)

Table 5 gives details about number of Antibiotics per prescription, of which single Antibiotic found in 36 prescriptions (30%), 2 Antibiotics found in 24 prescriptions (20%), three Antibiotics found in 24 prescriptions (20), more than three Antibiotics found in 10 prescriptions (8.34%).

Table 5: CLASS OF GASTRIC ACID SECRETION INHIBITORS (N=146)

Class	No of Gastric acid secretion inhibitors	Percentage (%)
Histamine 2 Receptor Antagonist(H2RA) (Ranitidine)	124	84.93
Proton pump inhibitors(Pantoprazole)	18	12.33
Antacid (Aluminium Hydroxide)	4	2.74

Table 5 shows classes of Gastric acid Secretion Inhibitors, where Histamine 2 Receptor Antagonist the highest prescribed-84.93%, followed by proton pump Inhibitors (12.33%) and least prescribed were Antacid (2.74%).

Table 6: CLASSES OF ANTIHYPERTENSIVES

Class	No of Antihypertensive (N=120)	Percentage (%)
Beta + Alpha adrenergic Blockers (Labetelol, Carvedilol)	10	28.57
Calcium Channel Blockers(nefedipine, Amlodipine)	20	57.14
Diuretics (Furosemide)	3	8.57
ACE Inhibitors (Ramipril)	2	5.72

Table 6 shows classes of Antihypertensive drugs, where Calcium channel blockers 20 (57.14%) is the highest prescribed which is similar to the study from Maharashtra by Rathod AM, Nefidipine and methyl dopa are frequently prescribed Antihypertensives^[17-19], followed by Beta Adrenergic Blockers 10 (28.57%), and least prescribed were Diuretics 3 (8.57%), ACE inhibitors 2 (5.72%).

Table 7: CLASSES OF ANALGESICS (N=108)

Class	No of Analgesics	Percentage (%)
Aryl Acetic Acid Derivatives+ Para aminophenol Derivatives (Diclofenac+ Paracetamol)	44	40.74
Aryl Acetic Acid Derivatives(Diclofenac, Aceclofenac)	26	24.07
Para Aminophenol Derivatives (Paracetamol)	20	18.52
Synthetic Opioids (Tramadol)	8	7.40
Anthranilic acid Derivative (Mephenamic acid)	8	7.40
Indol derivative (Indomethacin)	2	1.86

Table 7 will give the details about the classes of Analgesics where the highest prescribed were combination of Aryl acetic acid Derivatives+ Para aminophenol Derivatives-40.74% followed by Aryl acetic acid Derivatives-24.07%, Para aminophenol Derivatives-18.52%, NSAID's-9.26 and least prescribed were Synthetic opioids-7.40%

Table 8: CLASSES OF ANTIEMETICS (N=41)

Drug Class	No of Drugs	Percentage%
5HT ₃ Antagonists (Ondansetron)	32	78.05
H ₁ Antihistaminic (Doxylamine)	6	14.63
Prokinetic Drugs (Metoclopramide)	3	7.31

Table 8 shows the details of classes of Antiemetic drugs where the highest prescribed were 5HT₃ Antagonists-78.05% followed by H₁ antihistaminics-14.63% and Prokinetic Drugs-7.31%.

Table 9: CLASSES OF ANTISPASMODICS (N=32)

Drug Class	No of Drugs	Percentage (%)
Semi synthetic Derivatives (Hyoscine Butyl Bromide)	26	81.25
Vasicoselective (Flavoxate)	4	12.5
Novel Antispasmodics (Drotaverine)	2	6.25

Table 9 shows the classes of Anti spasmotic drugs where the highest prescribed were Semi synthetic Derivatives-81.25% (26), followed by Vasicoselective-12.5% (4), Novel Anti spasmotic drugs-6.25% (2).

Table 10: CLASSES OF INSULIN PREPARATIONS (N=32)

Drug Class	No of Drugs	Percentage (%)
Fast Acting Insulin (Mixtard, Actraoid)	24	75
Short Acting Insulin (Insugen)	8	25

Table 10 give the details about classes of Insulin preparations, where the highest prescribed were fast acting Insulin-24 (75%) and short acting Insulin-8 (25%).

Table 11: CLASSES OF CORTICOSTEROIDS (N=12)

Drug Class	No of Drugs	Percentage (%)
Short Acting Glucocorticoids (Hydrocortisone)	8	66.66
Intermediate Acting Glucocorticoids (Prednisolone)	4	33.33

Table 11 shows classes of Corticosteroids prescribed, where the highest prescribed were short acting Glucocorticoid's-8 (66.66%) and Intermediate acting Glucocorticoids-4 (33.33%).

Table 12: CLASS OF ANTICONVULSANTS (N=16)

Drug Class	No of Drugs	Percentage (%)
Benzodiazepines (Lorazepam, Clonazepam)	12	75
Hydantoinids (Phenytoin)	4	25

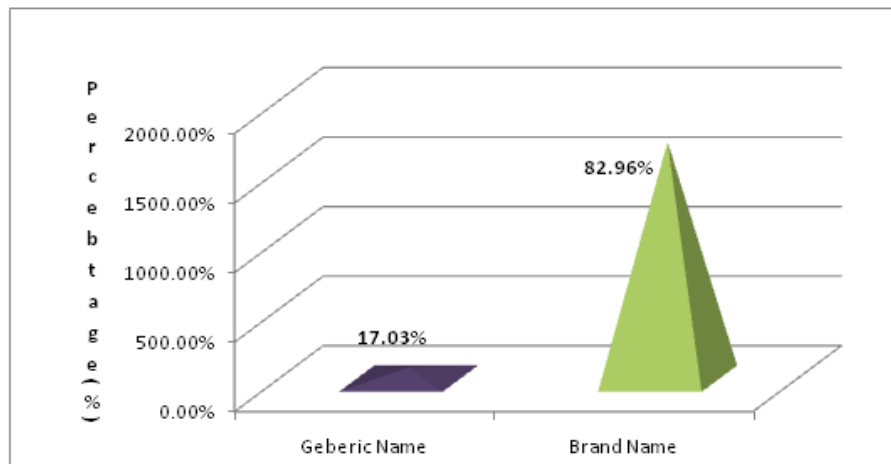


Figure 4: PERCENTAGE OF DRUGS PRESCRIBED IN GENERIC NAME (N=120)

Our study reports only 17.03% of drugs were prescribed by generic name. Our value is less than that reported in other studies^[20-21]. Prescribing by generic name helps the hospital pharmacy to have a better inventory control. This will also help the pharmacy to purchase the drugs on contract basis, as the number of brands is less. It can also reduce the confusion among the pharmacists while dispensing. Generic drugs are often more economic than the branded ones.

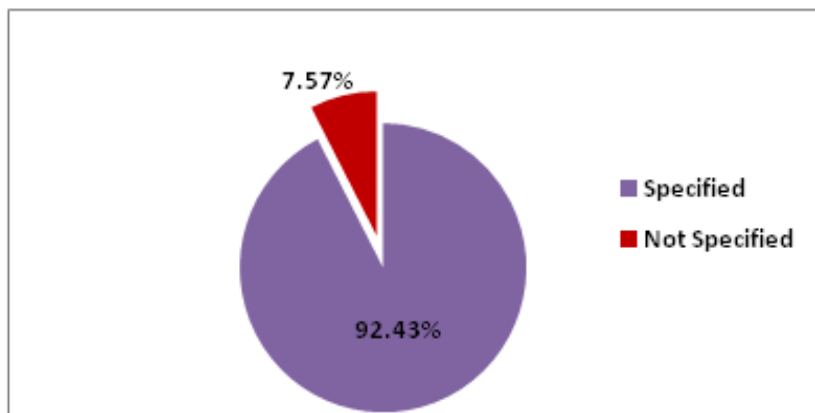


Figure 5: ROUTE OF ADMINISTRATION SPECIFIED (N=1004)

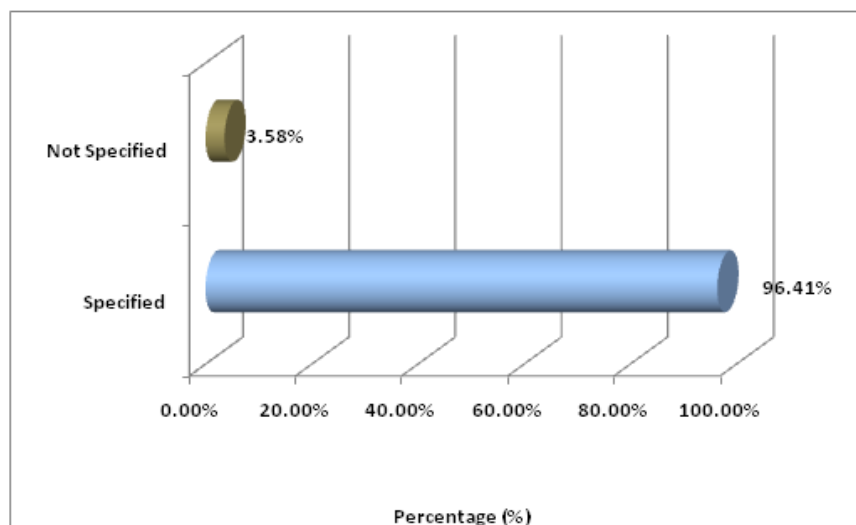


Figure 6: FREQUENCY SPECIFIED (N=1004)

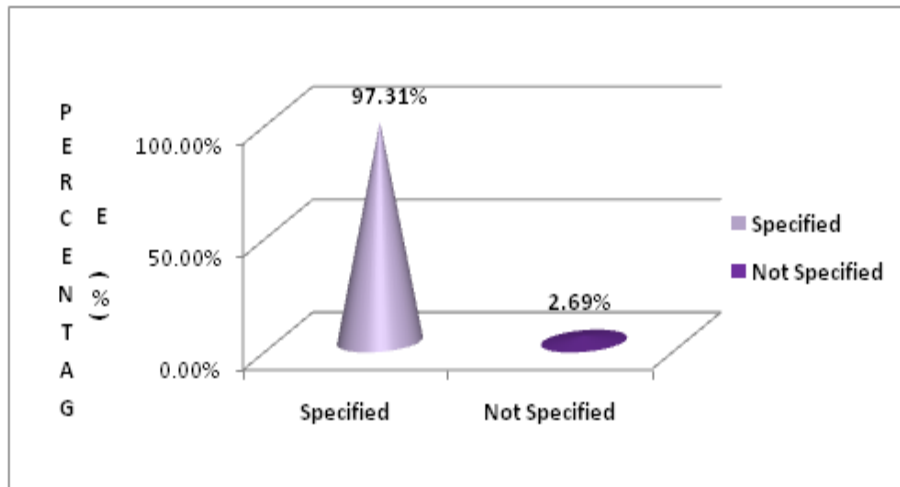


Figure 7: DOSE SPECIFIED

Figure 8: ALLERGY SPECIFIED (N=120)

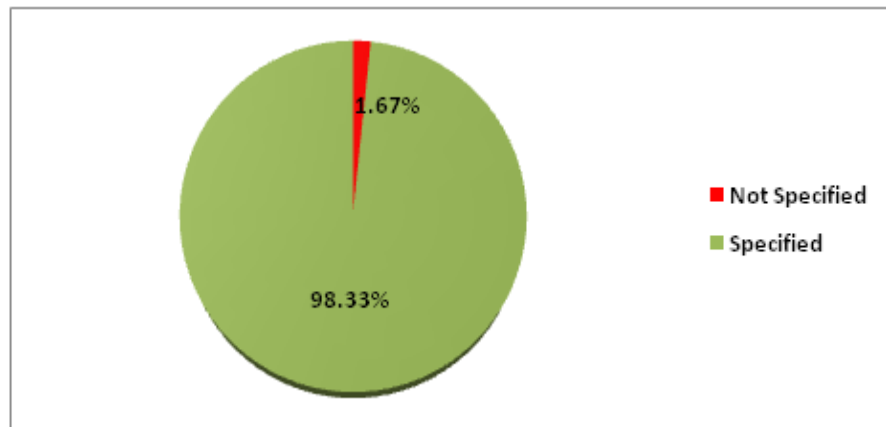


Table 13: COMMONLY USED ESSENTIAL MEDICATIONS IN THE OBG

Drug class	Drugs	Dose
Analgesics/Antipyretics	Diclofenac Tablet- Injection-	50mg 25mg/ml
	Paracetamol Tablet- Injection-	500mg 150mg/ml
	Tramadol Capsule- Injection-	50mg, 100mg 50mg/ml
Antiallergics	Hydrocortisone Injection-	100mg
	Tab.Prednisolone	5/10/20mg
Anti Infectives	Cap. Amoxicillin	250/500mg

	Inj. Ceftriaxone	250mg-1gm
	Tab. Cefixime	100/200mg
	Inj. Gentamycin	10mg/ml, 40 mg (as sulfate)/ mL in 2- mL vial.
	Metronidazole Tablet- Injection-	200/400mg 500mg/100ml
	Tab. Ofloxacin	100/200mg
	Tab. Nitrofurantoin	100mg
Antiemetics	Ondansetron Tablet- Injection-	4/8mg 2mg/ml

	Inj. Metoclopramide	5 mg (hydrochloride)/mL in 2-mL Ampoule.
Antifungals	Clotrimazole	Vaginal Cream-1% 10%. Vaginal Tablet-100mg, 500mg.
Antianaemia medicines	Ferrous salt+ Folic acid Folic acid	equivalent to 60 mg iron + 400 micrograms folic acid (Nutritional supplement for use during pregnancy). 400 micrograms*; 1 mg; 5 mg.
Human Immunoglobulin's	Anti-tetanus immunoglobulin	Injection:500 IU in vial.
Antihypertensive medicines	Tab. Amlodipine Furosemide Tablet- Injection-	5mg 40mg 10mg/ml in 2 ml ampoule
Antiseptics	Povidone Iodine	Solution:10% (equivalent to 1% available iodine).
Diuretics	Furosemide Injection- Tablet-	10mg/ml 10mg, 20mg, 40mg.
Gastric acid secretion Inhibitors	Ranitidine Injection- Tablet-	25mg/ml in 2 ml ampoule 150mg

Insulin Preparations	Inj. Insulin Regular	40IU/ml
	Intermediate Acting Insulin	40IU/ml
Oxytocics	Misoprostal	Tablet-200micrograms Vaginal tablets- 25micrograms
	Oxytocin	10IU in 1 ml
Vitamins/minerals	Ascorbic acid	Tablet-50mg
	Calcium	500mg
	Cholcalciferol	400IU, 1000IU
Anti Spasmodics	Hyoscine butyl bromide	
	Tablet- Injection-	10mg 20mg/ml

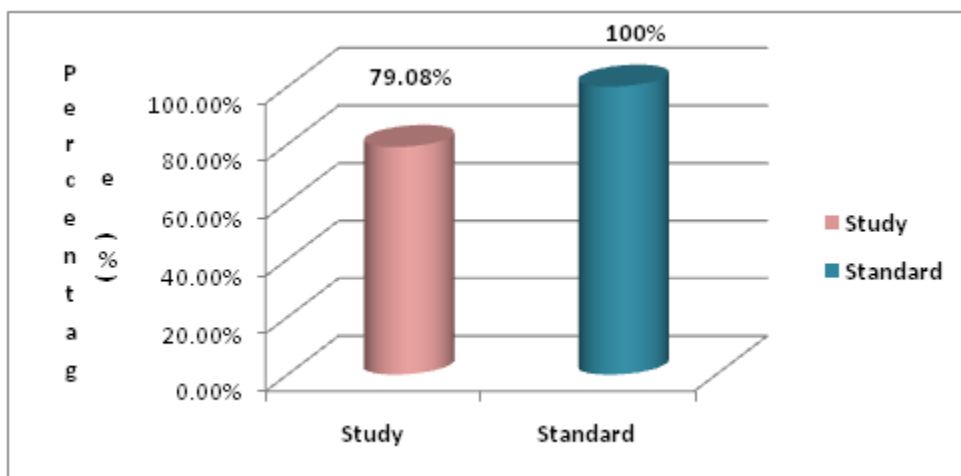


Figure 9: PERCENTAGE OF DRUGS; EML INCLUSIONS

The percentage of drugs prescribed from the essential drug list was 79.08% which is almost similar when compared to that of the study conducted in North India (75-95%) and in Ghana (93.2%)^[22,23]. Prescribing from these formularies and essential drug list can reduce the number of irrational combinations entering the market. It can also reduce the cost incurred on drugs.

Table 14: WHO PRESCRIPTION INDICATORS

Prescribing Indicators	No of Drugs	Result	Standard Derived
Average No of Drugs per Encounter	1004	8.36	1.6-1.8
Drugs Prescribed by Generic Name	171	17.03%	100%
Antibiotics Prescribed	219	21.81%	20.0-26.8%
No of Injections Prescribed	399	39.74%	13.4-24.1%
No of Drugs From Essential Medicine List	794	79.08%	100%

The average number of drugs per prescription was found to be 8.36 in our study which is almost similar than that reported from study conducted in Brazil (8.6), and greater than that reported from studies conducted in Ghana (3.6) and West Bengal, India (3.2).^[24-26] Our study indicating that polypharmacy has been practiced, polypharmacy is known to be a contributing factor for hospitalizations.^[27] It may also lead to drug interactions, adverse drug reactions patient and non-adherence. However, in certain conditions like cardiovascular problems, the patients may require more than one drug. The published Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment

of High Blood Pressure (JNC-VII) guidelines also permit polypharmacy in hypertension.^[28]

Percentage of drugs prescribed by generic name was 17.03%. This shows a greater tendency to prescribe by brand name rather than by generic name. Percentage of encounters with antibiotic prescribed was 21.81% which is in normal range. In a survey carried out at Denmark the antibiotics were prescribed in 22.3%.^[29] Percentage of encounters with an injection prescribed was 39.74%, which is high. Percentage of drugs prescribed from essential drugs list was low (79.08%) and requires change in the prescribing habits to get 100% result.

Table 15:

Pregnancy Category	Percentage of Drugs
Category A	45.40%
Category B	35.63%
Category C	16.67%
Category D	2.30%
Category X	0.00%

In our study majority of drugs were from category A (45.40%) followed by category B (35.63%), category C (16.67%) and category D (2.30%). No drugs were prescribed from category X. Similar pattern of category distribution was reported from similar studies conducted in other countries like India^[30] Netherland^[31] Finland^[32], Bratislava and Nitra^[33]. In a study by Bratislava and Nitra, it was reported that a vast majority of prescribed drugs during pregnancy, belonged to category C^[34]. So from the above data we can say that the prescription habit in our set up was quite safe.

CONCLUSION

The results of our study highlight several areas that need improvement, most importantly there is a Polypharmacy was practiced as the average number of drugs (8.36) per prescription when compared with a standard set by WHO. Another area that is Percentage of drugs prescribed by Generic name is also low which also need to improve.

Iron, Calcium and Folic acid were the most frequently prescribed drugs. Overall drug use pattern is rational with few exceptions which were mentioned above. Majority of the drugs were

prescribed from Essential Medicine List and majority of drugs were prescribed as per FDA Category A the Safest Category during pregnancy. This type of study can help in evaluating the existing drug use pattern and in planning appropriate interventions to ensure rational drug therapy.

REFERENCES:

1. Mitchell AA et.al, Gilboa SM, Werler MM, Kelley KE, Louik C, Hernandez-Diaz S, Study T.B.D.P. Medication used during pregnancy, with particular focus on prescription drugs: 1976-2008. American Journal of Obstetrics and Gynaecology .2011; 205(1):51.e1-8.
2. Anusha et al prescribing pattern of drugs in department of Obstetrics and Gynaecology in a tertiary care hospital. International journal of pharmacy and technology. 2012;VOL2,214-18.
3. Sharma R, Kapoor, B, Verma, U. Drug utilization pattern during pregnancy in North India. Ind J Med Sci. 2006; 60(7): 277-87. <http://dx.doi.org/10.4103/0019-5359.26602>
4. 2. Nielsen GL, Nørgard B, Puho E, Rothman KJ, Sørensen HT, Czeizel AE. Risk of specific congenital abnormalities in offspring of

- women with diabetes. *Diabet Med.* 2005 June; 22(6): 693–96.
<http://dx.doi.org/10.1111/j.1464-5491.2005.01477.x>; PMID:15910618
5. McBride WG. Thalidomide and congenital abnormalities. *Lancet* 1961; 2: 1358
 6. Henry A et al, Crowther C. Patterns of medication use during and prior to pregnancy: the MAP study. *Australian and New Zealand Journal of Obstetrics and Gynaecology* 2000; 40:165-72.
 7. Sharma R et al, Verma U, Sharma CL, Kapoor B. Self-medication among urban population of Jammu city. *Indian Journal of Pharmacology* 2005;37:37-45.
 8. Gama H et al. Drug utilization studies. *Arquivos De Medicina.* 2008; 22(2/3):69-74.
 9. De Jong LT et al, Van den Berg PB. A study utilization during pregnancy in the light of known risks. *International Journal of Risk Safety Medicines.* 1990; 1:91-105.
 10. Sivasakthi. R et al . Assessment of pregnancy prescriptions in an ante-natal clinic *Der PharnaciaLette*, 2011,3(3):306-310.
 11. Brin M. Blood trans-ketolase determination in the diagnosis of thiamine deficiency. *Heart Bull.* 1968;17: 68-89.
 12. Andreasen F. Protein binding in plasma from patients with acute renal failure. *Acta. Pharmacol. Toxicol.* 1973;32: 417-29.
 13. Akhtar MS (2012). Drug prescribing practices in paediatric department of a north Indian university teaching hospital. *Asian J. Pharm. Clin. Res.* 5(1):146-149.
 14. World health organisation. The rational use of drugs. Report of the conference of experts. Nairobi, 25-29 nov 1985 Geneva. World Health Organisation, 1987.
 15. International network for rational use of drugs & WHO. How to investigate drug use in health facilities: Selected drug use indicators. Geneva: World Health Organisation. 1993;1:1-87.
 16. Sharma R, Kapoor B, Verma U. Drug utilization pattern during pregnancy in North India. *Indian J Med Sci* 2006; 66: 277-87
 17. Czeizel AE et al, Dudas L Prevention of the first occurrence of neural-tube defects by Periconceptional vitamin supplementation. *New England Journal of medicines* 1992; 327:1832-5.
 18. Czeizel AE et al, Prevention of congenital abnormalities by periconceptional multivitamin supplementation *British medical Journal* 1993;306:1645-8.
 19. Czeizel AE et al, Reduction of urinary tract and cardiovascular defects by periconceptionalmultivitamin supplementation. *American Journal Medical Genetics* 1996;62:179-83.
 20. Bosu WK, Ofori-Adjei D. A 1-day survey of drug prescribing patterns in the District general Hospital of the Wassa West District of Ghana. *Trop Doct* 1997; 4:222-6.
 21. Najmi MH, Hafiz RA, Khan I, Fazil FR. Prescribing practices: an overview of three teaching hospitals in Pakistan. *J Pak Med Assoc* 1998; 48 (3):73-7
 22. Biswas NR, Biswas RS, Pal PS et al. Patterns of prescriptions and drug use in two tertiary hospitals in Delhi. *Indian J PhysiolPhamacol* 2000;44(1):109-12.
 23. Bosu WK, Ofori-Adjei D. An audit of prescribing practices in healthcare facilities of Wassa West district of Ghana. *West Afr J Med* 2000; 19(4):298-303.
 24. Victora CG, Facchini LA, GrassiFilho M. Drug use in southern Brazilian hospitals. *Trop Doct* 1982; 12:231-5.
 25. Bosu WK, Ofori-Adjei D. A 1-day survey of drug prescribing patterns in the District general Hospital of the Wassa West District of Ghana. *Trop Doct* 1997; 4:222-6.
 26. Hazra A, Tripathi SK, Alam MS. Prescribing and dispensing activities at the health facilities of a nongovernmental organization. *Natl Med J India* 2000;13(4): 177-82.
 27. Flaherty JH, Perry HM 3rd, Lynchard GS, Morley JE. Polypharmacy and hospitalization among older home care patients. *J Gerontol A BiolSci Med Sci* 2000;55(10):M554-9
 28. Chobanian AV, Bakris GL, Black HR et al: The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure *JAMA* 2003;289(19):2560-2571.
 29. Olesan C, Steffensen FH, Nielsen GL, de - Jong - Vanden Berg L, Olesan J. Sorensen HT. Drug use in first pregnancy and lactation; a population - based survey among Danish women. *Eur J ClinPharmacol* 1999; 55

30. Harsh Joshi, Sejal Patel, Kamlesh Patel, Varsha Patel. Drug use pattern during pregnancy: A prospective study at tertiary care teaching hospital. *NHL Journal of Medical Sciences*. 2012;1(1):13-16.
31. Bakker MK, Jentink J, Vroom F, Van Den Berg PB, De Walle HE, De Jong - Van Den Berg LT . Drug prescription pattern before during and after pregnancy for chronic, occasional and pregnancy related drugs in the Netherlands. *Br J Obstet Gynecol*. 2006;113:559-68.
32. . Malm H, Martikainen J, Kalukka T, Neuvonen PJ. Prescription of hazardous during pregnancy. *Drug Safety*. 2204;27:899-908.
33. Tisonova J, Magulova L, Goboova M, Wawruch M, Lassanova M, Bozekova L, Kriska M. Consultation activity of two Slovak Centres for pharmacotherapy during pregnancy and lactation. *CasLekLesk* 2006; 145:154-7.
34. Tisonova J, Magulova L, Goboova M et al : Consultation activity of two Slovak Centres for pharmacotherapy during pregnancy and lactation. *CasLekLesk* 2006; 145: 154-9.