



DRUG USAGE IN PREGNANCY IN AN OUT PATIENT DEPARTMENT IN TERTIARY CARE HOSPITAL IN BIHAR

Kirti Bala¹, Nikhil Era^{*1}, Shatavisa Mukherjee² and Sushanta Kumar Bordolai¹

¹Department of Pharmacology, MGM Medical College and LSK Hospital, Kishanganj, Bihar.

²Department of Clinical and Experimental Pharmacology, School of Tropical Medicine, Kolkata.

***Corresponding Author: Dr. Nikhil Era**

Assistant Professor, Department of Pharmacology, MGM Medical College and LSK Hospital, Kishanganj, Bihar.

Article Received on 23/08/2019

Article Revised on 13/09/2019

Article Accepted on 03/10/2019

ABSTRACT

Background: Avoidance of pharmacological treatment in pregnancy is unrealistic. With limited safety information on drugs used in pregnancy in specific populations, drug utilisation research provides a robust source of population glimpse. The present study was undertaken to evaluate the drugs utilisation pattern and practice during pregnancy in woman attending ante natal (ANC) clinic in a tertiary care institution set-up in eastern India. **Methodology:** A prospective, observational study was carried out for a period of one year in which all prescriptions were studied for all patients attending ANC in any trimesters and then categorized trimester wise to assess the prescribing frequency of each drugs in an individual trimester. Basic demographic details including age, gravid, history of abortion, time for first ANC seeking, total ANC sought were noted. Drug usage including type, dosage, duration of use and pregnancy risk categorization were noted. Prescribing practices were assessed using WHO Drug prescribing indicators. **Results:** Of total 368 pregnant women, 50.81% participants were of primigravida and 29.89% had positive history of abortion. Time for seeking the first antenatal check-up was majorly in 1st trimester with majority having more than 5 antenatal checkups. A total of 3054 drugs were prescribed in all three trimesters from all organ systems of which majority belonged to blood and bone forming agents, followed by antimicrobials and gastrointestinal drugs. During the entire study period, there were 177 prescriptions for 1st trimester, 306 prescriptions for 2nd trimester and 366 prescriptions for 3rd trimester. **Conclusion:** Knowledge of the potential danger of medication use during pregnancy, and recognition of the fact that important clinician understanding is still lacking and should warrant conservative use of medication. Rational and judicious practice will ultimately help in further improvement of the health status of the mother and her offspring.

INTRODUCTION

The use of drugs during pregnancy calls for special attention because of potential hazard to the mother and as well as unborn child.^[1] Careful consideration of the benefit to the mother and risk to the fetus is required while prescribing drug during pregnancy. Most clinician likes to avoid drug use during pregnancy. There are major concerns of permanent harm and effect on growth and development of the fetus. Maternal medications can also increase the incidence of abortion, fetal demise, premature or delayed labor amongst other complications. Antenatal care is an organized medical service involving proper clinical 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.^[2] The prime causes for maternal mortality includes infections, haemorrhage, anemia and pre-eclampsia which are otherwise preventable by optimum antenatal care. Timely treatment of such conditions can reduce the perinatal morbidity and mortality to an extent. Pregnant women requiring

prescription drugs pose a challenge to physicians to avoid any risk to the mother and to the fetus.^[3]

However, various drug usage in pregnancy is inevitable. Supplementary drug treatment like iron, folic acid, calcium, vitamins are prescribed commonly to improve overall nutritional status of mother and foetus. 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. Therefore, judicious use of drugs, adequate knowledge, positive approach and awareness towards the drug use are mandatory prerequisites for good maternal and child health.^[4] The drugs given to the pregnant mother for therapeutic purpose may even cause serious structural and functional deformities in the developing child since it is very difficult to determine the effects of the drugs to the foetus before marketing new

drugs. Thus owing to obvious ethical reasons most drugs are not recommended to be used during pregnancy before adequate clinical trial and acceptable risk benefit ratio.^[5] As there are numerous gaps in knowledge pertaining to detections of consequence of the foetus post delivery, prescription of drugs to the pregnant woman should be viewed as public health concern and mandates proper vigilance.

Total avoidance of pharmacological treatment in pregnancy is unrealistic and may be dangerous. In order to gain knowledge on factors influencing pregnant women's drug use and possible teratogenic drug effects, pharmacoepidemiological studies are necessary.^[6] In addition, by studying how drugs are used in pregnancy, to what extent and by whom, misuse and misconception can be intercepted. 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,^[7] but are also helpful in the development of the fetus. 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.^[8] However, pregnant women are generally excluded from clinical trials on ethical grounds. Safety information regarding drug use in pregnancy is gathered through case reports, epidemiological studies and animal studies, all of which have certain limitations of their own. Drug utilisation research here comes in rescue, as these research serves to provide a robust source of population data which helps to gather definite information on the safety profile of prescribes drugs in pregnancy.^[9,10] With this background the present study was undertaken to evaluate the drugs utilisation pattern and practice during pregnancy in woman attending ante natal (ANC) clinic of a tertiary healthcare centre and teaching institution at Bihar, India. This data can be utilized in strategic planning to ensure better patient care services in the institution and to improve rational drug use in our facility.

MATERIALS AND METHODS

A prospective, observational study was carried out for a period of one year at the Outpatient Department of Obstetrics and Gynecology of a tertiary healthcare institution established in rural outskirts of Bihar which provides super-specialty care to under-served population of this region. The study initiated after obtainment of ethical clearance from institutional ethics committee. All consecutive pregnant women attending anti-natal clinic during the study duration were enrolled for the study after obtaining their consent for participation. Prescriptions were studied for all patients attending the antenatal clinic (OPD) in any trimesters and then categorized trimester wise to assess the prescribing frequency of each drugs in an individual trimester. Basic demographic details including age, gravid, history of abortion if any were noted. Socioeconomic analysis were

performed using Kuppuswamy Socioeconomic scale (modified version 2016).^[11] Time for seeking the first ANC and the total ANC sought were noted for each patient. Drug usage including type, dosage and duration of use were noted. Pregnancy risk categorization^[12] of drugs will be considered for further analysis of data. The drugs were classified by therapeutical classes according to the Anatomic Therapeutic Chemical Classification of Drugs (ATC)^[13] and regrouped into different drug categories. To study changes in drug use during pregnancy, number of women using drugs during three different time periods were noted at first trimester (from 0 to 12 weeks), second trimester (13 to 26 weeks) and third trimester (27 weeks - till delivery). WHO Drug prescribing indicators^[14] were used to assess the prescribing practices.

Data collected was checked for completeness and then statistically analyzed.

RESULTS

This prospective observational study included 368 pregnant women among whom 69.02% of the females belonged to the age group of 20-25 years followed by 19.02% of the study population belonging to the 26-30 years group. Socioeconomic profile of the study participants was analyzed using Modified Kuppuswamy's socio-economic status scale (Revised for 2016). 60.60% (n=223) of the pregnant females belonged to the upper lower class followed by 22.28% (n=82) females belonging to the lower middle class, 15.49% (n=57) to the lower class, 1.36% (n=5) to upper middle class and 0.27% (n=1) to the upper class. 82.61% of the females hailed from rural, while 17.39% residing in urban area. 50.81% (n=187) participants were of primigravida. 110 females (29.89%) reported positive history of abortion during history taking. Time for seeking the first antenatal check-up was majorly in 1st trimester (48.10%), followed by 35.60% in 2nd and 16.30 % in 3rd trimester. Majority of the study participants (49.18%) had more than 5 antenatal checkups, while 36.14% females had 3-5 antenatal checkups. During the antenatal check-up, the lab data such as BP (Blood Pressure), Hb (Haemoglobin), RBS (Random Blood Sugar) and TSH (Thyroid Stimulating Hormone) levels were measured. Amongst various co-morbidities encountered, anaemia topped the charts with 72.01%, followed by hypertension (35.87%), asthma (31.52%), hypothyroidism (24.18%) and tuberculosis (13.31%). Other co-morbidities noted were chronic bronchitis, gestational diabetes and ovarian cysts. (Table 1).

Table 1: Basic Demographics.

	No (%)
Age Groups	
<20 years	29 (7.88)
20-25 years	254 (69.02)
26 – 30 years	70 (19.02)
31- 35 years	6 (1.63)
>35 years	5 (1.36)
Socioeconomic Class	
Upper class	1 (0.27)
Upper middle class	5 (1.36)
Lower middle class	82 (22.28)
Upper lower class	223 (60.60)
Lower class	57 (15.49)
Place of Stay	
Urban	64 (17.39)
Rural	304 (82.61)
Gravida	
Primigravida	187 (50.81)
Multigravida	2 109 (29.62)
	3 58 (15.76)
	4 12 (3.26)
	5 2 (0.54)
	6 0 (0)
Abortion History	
Yes	110 (29.89)
No	258 (70.11)
Time for seeking first ANC	
1 st Trimester	177 (48.10)
2 nd Trimester	131 (35.60)
3 rd Trimester	60 (16.30)
Total No. of ANC Visits	
<3	54 (14.67)
3 – 5	133 (36.14)
>5	181 (49.18)
Comorbidities	
Anemia	265 (72.01)
Asthma	116 (31.52)
Chronic Bronchitis	75 (20.38)
Tuberculosis	49 (13.31)
Gestational Diabetes	14 (3.80)
Hypothyroidism	89 (24.18)
Hypertension	132 (35.87)
Ovarian Cyst	26 (7.06)

Prescribing pattern of drugs

A total of 3054 drugs were prescribed in all three trimesters from all organ systems (Table 2,3). Majority belonged to blood and bone forming agents, followed by antimicrobials and gastrointestinal drugs. Analyzing the prescribing trend grossly depicts that the drug

prescribing showed a gradual increase from 1st to 2nd trimester, followed by a slow drop in 3rd trimester. During the entire study period, there were 177 prescriptions for 1st trimester, 306 prescriptions for 2nd trimester and 366 prescriptions for 3rd trimester.

Table 2: Prescribing Pattern of Drugs.

	1 st Trimester (n=177)	2 nd Trimester (n=306)	3 rd Trimester (n=366)	Total
Drugs acting on Gastrointestinal System	137 (77.40)	181 (59.15)	137 (37.43)	455 (14.90)
Drugs acting on Cardiovascular System	29 (16.38)	57 (18.63)	19 (5.19)	105 (3.43)
Drugs acting on Endocrine System	26 (14.69)	44 (14.38)	44 (12.02)	114 (3.73)
Antimicrobials	149 (84.18)	248 (81.04)	174 (47.54)	571 (18.70)
Antimalarials	34 (19.21)	58 (18.95)	44 (12.02)	136 (4.45)
Drugs acting on Nervous System	38 (21.47)	56 (18.30)	38 (10.38)	132 (4.32)
Drugs acting on Respiratory System	88 (49.72)	153 (50)	63 (17.21)	304 (9.95)
Blood and Bone Forming Agents	133 (75.14)	432 (141.17)	352 (96.17)	917 (30.02)
Others	57 (32.20)	109 (35.62)	154 (42.07)	320 (10.48)

Table 3: Trimester Specific Drug Usage Pattern.

		1 st Trim (n=177)	2 nd Trim (n=306)	3 rd Trim (n=366)	Total	Category
Drugs acting on Gastrointestinal System	Ranitidine	21 (11.86)	35 (11.43)	19 (5.19)	75 (2.45)	B
	Pantoprazole	13 (7.34)	34 (11.11)	49 (13.39)	96 (3.14)	B
	Rabeprazole	19 (10.73)	32 (10.46)	39 (10.65)	90 (2.95)	B
	Lactulose	13 (7.34)	10 (3.26)	5 (1.37)	28 (0.92)	B
	Doxylamine Succinate	20 (11.30)	26 (8.50)	12 (3.28)	58 (1.90)	A
	Ondansetron	24 (13.56)	20 (6.53)	8 (2.19)	52 (1.70)	B
	Dicyclomine	27 (15.25)	24 (7.84)	5 (1.37)	56 (1.83)	B
Drugs acting on Cardiovascular System	Methyldopa	11 (6.21)	29 (9.48)	10 (2.73)	50 (1.64)	B
	Aspirin	9 (5.08)	25 (8.17)	5 (1.37)	39 (1.28)	C
	Atenolol	3 (1.69)	0 (0)	0 (0)	3 (0.09)	D
	Isoxsuprine	0 (0)	0 (0)	4(0.13)	4 (0.13)	C
	Nicardipine	6 (3.38)	3 (0.98)	0 (0)	9 (0.29)	C
Drugs acting on Endocrine System	Insulin	8 (4.51)	24 (7.84)	18 (4.92)	50 (1.63)	C
	Thyroxine	0 (0)	15 (4.90)	26 (7.10)	41 (1.34)	A
	Betamethasone	8 (4.51)	0 (0)	0 (0)	8 (0.26)	C
	Mifepristone	2 (1.12)	0 (0)	0 (0)	2 (0.06)	X
	Prednisone	8 (4.51)	5 (1.63)	0 (0)	13 (0.42)	C
Antimicrobials	Metronidazole	12 (6.77)	20 (6.53)	14 (3.82)	46 (1.51)	B
	Clotrimazole	12 (6.77)	21 (6.86)	8 (2.19)	41 (1.34)	B
	Amoxicillin	13 (7.34)	30 (9.80)	27 (7.38)	70 (2.29)	B
	Cefixime	12 (6.77)	23 (7.52)	20 (5.46)	55 (1.80)	B
	Azithromycin	14 (7.91)	30 (9.80)	29 (7.92)	73 (2.39)	B
	Erythromycin	9 (5.08)	7 (2.28)	0 (0)	16 (0.52)	B
	Benzathine Penicillin	13 (7.34)	6 (1.96)	0 (0)	19 (0.62)	B
	Clindamycin	13 (7.34)	26 (8.50)	22 (6.01)	61 (2)	B
	Rifampicin	23 (12.99)	40 (13.07)	26 (7.10)	89 (2.91)	C
	Isoniazid	28 (15.82)	45 (14.70)	28 (7.65)	101 (3.31)	C
Antimalarials	Chloroquine	24 (13.56)	33 (10.78)	27 (7.38)	84 (2.75)	C
	Artesunate	10 (5.64)	25 (8.17)	17 (4.64)	52 (1.70)	N
Drugs acting on Nervous System	Paracetamol	18 (10.16)	35 (11.44)	27 (7.38)	80 (2.62)	B
	Phenytoin sodium	9 (5.08)	14 (4.57)	8 (2.19)	31 (1.01)	D
	Valproate sodium	11 (6.21)	7 (2.29)	3 (0.81)	21 (0.69)	D
Drugs acting on Respiratory System	Ambroxol	12 (6.77)	24 (7.84)	8 (2.19)	44 (1.44)	B
	Levocetirizine	19 (10.73)	43 (14.05)	24 (6.55)	86 (2.82)	B
	Dextromethorphan	9 (5.08)	23 (7.52)	11 (3)	43 (1.41)	C
	Salbutamol	13 (7.34)	20 (6.53)	0 (0)	33 (1.08)	C
	Phenylephrine	18 (10.17)	6 (1.96)	0 (0)	24 (0.78)	C
	Formoterol	5 (2.82)	9 (2.94)	0 (0)	14 (0.45)	C
	Budesonide	12 (6.77)	28 (9.15)	20 (5.46)	60 (1.96)	B
Blood and Bone Forming Agents	Iron and Folic Acid	69 (38.98)	198 (64.70)	187 (51.09)	454 (14.86)	A
	Calcium Carbonate	64 (36.16)	234 (76.47)	165 (45.08)	463 (15.16)	A
Others	Multivitamins	55 (31.07)	109 (35.62)	154 (42.08)	318 (10.41)	N

	Misoprostol	2 (1.12)	0 (0)	0 (0)	2 (0.06)	X
Total Drugs Prescribed		691	1338	1025	3054	

The present study showed maximum prescribing (35.95%) of Category B drugs in all trimesters. Prescribing of category A was 33.26%, followed by Category C at 16.73%. Category D and X drugs were also prescribed in our set up, though the frequency was

low. Medications like multivitamins and artesunate belonged to 12.11% prescribing which was uncategorized under risk stratification of pregnancy drugs. (Table 4)

Table 4: Pregnancy Risk Categorization of Drugs.

Category	1 st Trimester (n=691)	2 nd Trimester (n=1338)	3 rd Trimester (n=1025)	Total (n=3054)
A	153 (22.14)	473 (35.35)	390 (38.05)	1016 (33.26)
B	287 (41.53)	477 (35.65)	334 (32.58)	1098 (35.95)
C	159 (23.01)	233 (17.41)	123 (12)	511 (16.73)
D	23 (3.33)	21 (1.56)	11 (1.07)	55 (1.80)
X	4 (0.58)	0 (0)	0 (0)	4 (0.13)

Analyzing drug prescribing in dosage forms, 58.57% drugs were prescribed in tablet form, while 34.48% were in capsule form. 4.55% and 2.39% drugs prescribed were in syrups and parenteral form respectively. Assessing WHO core drug prescribing indicators among patients in antenatal care (Table 5), it was observed that average number of drugs per prescription was found to be 3.90 in 1st trimester, 4.37 in 2nd trimester and 2.80 in 3rd trimester. Generic prescribing was 75.98% in 1st trimester, 78.84% in 2nd trimester and 76.29% in 3rd trimester. Prescribing percentage of antibiotics in all trimesters were on high rise like 19.83% in 1st trimester,

16.96% in 2nd trimester and 16.19% in 3rd trimester. Percentage of encounters with an injection prescribed was 11.86% in 1st trimester, 9.8% in 2nd trimester and 6.01% in 3rd trimester. Percentage of drugs prescribed from essential drug list was probed. National List of Essential Medicine (NLEM 2015) was considered as reference. Prescribing percentage from essential drug list was followed in our hospital setup. Prescribing percentages were found to be 89% for 1st trimester, 90.43 % for 2nd trimester and 91.51% for 3rd trimester which indicates that prescribing in our hospital is complying with the national drug policy.

Table 5: Assessment as per WHO core drug prescribing indicators.

	1 st trimester	2 nd trimester	3 rd trimester
Average number of drugs per prescription	3.90	4.37	2.80
Percentage of drugs prescribed by generic name	75.98	78.84	76.29
Percentage of encounters with antibiotic prescribed	19.83	16.96	16.19
Percentage of encounters with an injection prescribed	11.86	9.80	6.01
Percentage of drugs prescribed from essential drug list	89	90.43	91.51

DISCUSSION

Pregnancy complications are still a major health problem among women in developing countries. The maternal mortality ratio in developing countries quite high in comparison to those in developed countries. The ratio remains high in rural as compared to urban areas. Pregnancy is a time of profound physiological changes in women body, necessitating prudent consideration while drug prescribing. Since many enter pregnancy with chronic health problems that require continuous or intermittent use of prescription medication, recommendation of complete avoidance of drugs is also not unrealistic and is equally dangerous to both mother-child duo.^[1] Pregnancy should not deter clinicians from providing their patients with appropriate management of their medical conditions.^[15, 16]

About 2 to 3% of all birth defects are attributed to drug usage. By physiology, drugs taken by a pregnant woman

reaches the fetus primarily by crossing the placenta, the same route that is taken by oxygen and nutrients, which are needed for the fetus's growth and development. In general, drugs should not be used during pregnancy until deemed necessary as risk to foetus remains a big concern. It is a challenge for every clinician to balance the risks and benefits of drug therapy during pregnancy. To ensure rational drug usage during pregnancy, careful consideration during prescribing and proper patient counselling is warranted which may reduce medication errors thus ensuring patient safety. However information on major drugs used in pregnancy are absent in most antenatal clinics. High-quality analyses of prescription drug use during pregnancy are thus needed as drug usage practices are changing over time.^[17]

Drug prescribing in pregnant females has been a concern for mothers, health care providers, and the public since the 1960's thalidomide saga as quality information about

the safety and effectiveness of medicine use during pregnancy is lacking for the majority of prescription drugs available on the market.^[18, 19, 20] There have been numerous calls for more research into prescription drug use during pregnancy and associated health risks.^[21, 22] A number of studies have found that the use of prescription drugs during pregnancy is common and, though varying across jurisdictions, is increasing over time.^[23, 24, 25, 26, 27, 28] Research on the use of prescription medicines in pregnancy remains critically important. Defining how commonly medicines are used during pregnancy which medicines are most often used, and how patterns of such use are changing over time will help define new research priorities in this field.^[29, 30, 31] For these reasons, research on the use of prescription medicines in pregnancy remains critically important. This present prospective observational study describes the trends and patterns of prescription drug use during pregnancy in a tertiary care institution in Eastern India, which included 368 pregnant women, majority of whom belonged to the upper lower class and mostly hailing from rural areas. The order of pregnancy revealed that majority of the participants in this study were primigravida which is similar to studies reported by Adhikari et al and Sharma et al conducted in Central and Northern^[32] parts of India respectively. Majority of antenatal mothers were primigravida in our study which is consistent with other study reports.^[33, 34] The timing of the first prenatal visit showed that most of the women attended clinics during 12–24 weeks which was similar to a study reported in China by Zhu et al.^[35] It was seen that maximum number of participants did not have an abortion history similar to the study by Zhu et al. Majority of the study participants had more than 5 antenatal checkups. The usage of the drugs when classified using the ATC code revealed that the most commonly used class of drugs belonged to blood and bone forming agents followed by antimicrobials and gastrointestinal drugs.

Our study site revealed a greater tendency to prescribe by generic name rather than by brand name in our hospital which is a good sign as it reduces the economic burden on the patients. In other previous studies, it was less. Prescribing percentage of antibiotics in all trimesters was on high rise, while percentage of encounters with an injection was within acceptable ranges. Unnecessary usage of antimicrobials will result in both excess cost to the patient and also development of widespread resistance. Using the USFDA risk classification the percentage of women receiving drugs from different classes were documented. Though the present study showed that Category D and Category X drugs have been less prescribed to the antenatal women, still use of these drugs should be minimized or stopped. WHO core prescribing indicators are useful parameters to assess the rationality of prescribing of medications. They are helpful in preventing polypharmacy, overuse of antibiotics, usage of costly forms of therapy, etc. As the present study suggests that more number of drugs (as compared to WHO reference value) were prescribed per

prescription, so this might increase the chances of adverse reactions and/or drug-drug interactions in these women, which might be harmful for them as well as the baby. In the present study, average number of drugs per prescription was quite high compared to World Health Organization (WHO) standard values of less than or equal to two drugs per prescription. Our study witnessed that monotherapy was rarely practiced among patients. Average number of drugs per prescription was found to be 3.90 in 1st trimester, 4.37 in 2nd trimester and 2.80 in 3rd trimester. Average number of drugs prescribed per prescription was higher than the WHO reference value which calls for caution. Percentage of drugs prescribed from essential drug list was probed. National List of Essential Medicine (NLEM 2015)^[36] was considered as reference. Prescribing percentage from essential drug list was followed in our hospital setup. Prescribing percentages were found to be 89% for 1st trimester, 90.43% for 2nd trimester and 91.51% for 3rd trimester which indicates that prescribing in our hospital is complying with the national drug policy. However conferring to the national drug policy also mandates revision of drug policy according to the needs. So, inclusion of rest drugs which are frequently used in pregnancy conditions, in the national drug policy is a mandate for countries like India, where access to medications in rural is facilitated by essential drugs availability.

Our findings are strengthened by the prospective collection and comprehensiveness of the data we analysed and the data categorization trimester wise. Assessing WHO drug prescribing indicators and probing their changes trimester wise remains the key feature of this present study. However, our study is not without limitations. However, while not equivalent to a measure of consumption by a patient, dispensation information is a more accurate measure of drug exposure than data on prescriptions written because, for a variety of reasons, many prescriptions written by doctors are not filled by patients. Data on other socioeconomic indicators (e.g. years of education, lone parenthood) that were previously shown to be associated with drug use in pregnancy was limited and thus it was not possible to account for these factors.

While prescribing medications, clinicians should adhere firmly to the rule of RIGHT (right drug, right patient, right dosage, and right cost) and SANE criteria (safety, affordability, need, efficacy). Every hospital should form a medical body of their own so as to monitor and promote rational drug therapy. Attempts should be made by the healthcare system authorities for continuous development and revision of standard treatment guidelines or prescribing policies. Healthcare professionals should be sensitized regularly through continuous medical educational programs regarding the recent updates on medications and treatment guidelines. Such practice will enhance rational prescribing of drugs

to the pregnant women and hence will help in preventing adverse and/or teratogenic effects in offsprings.

CONCLUSION

Knowledge of the potential danger of medication use during pregnancy, and recognition of the fact that important clinician understanding is still lacking and should warrant conservative use of medication. During pregnancy, the indication for a drug treatment needs the utmost caution. Further improvement in adherence to the prescribing of drugs as per their generic name should be practiced. Such rational practice will ultimately help in further improvement of the health status of the mother and her offspring.

Source of Support: Nil.

Conflict of Interest: None Declared.

REFERENCES

1. Sachdeva P, Patel BG, Patel BK. Drug Use in Pregnancy; a Point to Ponder! Indian Journal of Pharmaceutical Sciences, 2009; 71(1): 1-7. doi:10.4103/0250-474X.51941
2. WHO recommendations on antenatal care for a positive pregnancy experience. Accessed from <http://apps.who.int/iris/bitstream/handle/10665/250796/9789241549912-eng.pdf;jsessionid=F18DEA3F54F008A8E4A78122299DCB55?sequence=1>. Accessed on August 30, 2018.
3. Webster WS, Freeman JA. Prescription drugs and pregnancy. Expert Opin Pharmacother, Jun, 2003; 4(6): 949-61.
4. Rubin P. Drug treatment during pregnancy. BMJ : British Medical Journal, 1998; 317(7171): 1503-1506.
5. Bánhidý F, Lowry RB, Czeizel AE. Risk and Benefit of Drug Use During Pregnancy. International Journal of Medical Sciences, 2005; 2(3): 100-106.
6. Melton MW. Take two Aspirin or not? Risk of medication use during pregnancy. Mother Baby J., 1999; 4: 25-32.
7. Zacharias J. A rational approach to drug use in pregnancy. JOGN Nurs, May-Jun, 1983; 12(3): 183-7.
8. Kim JH1, Scialli AR. Thalidomide: the tragedy of birth defects and the effective treatment of disease. Toxicol Sci., Jul, 2011; 122(1): 1-6.
9. Mittal N, Mittal R, Singh I, Shafiq N, Malhotra S. Drug Utilisation Study in a Tertiary Care Center: Recommendations for Improving Hospital Drug Dispensing Policies. Indian Journal of Pharmaceutical Sciences, 2014; 76(4): 308-314.
10. Sannerstedt R, Lundborg P, Danielsson BR, Kihlström I, Alván G, Prame B et al. Drugs during pregnancy: an issue of risk classification and information to prescribers. Drug Saf., Feb, 1996; 14(2): 69-77.
11. Shaikh Z, Pathak R. Revised Kuppaswamy and B G Prasad socio-economic scales for 2016. Int J Community Med Public Health, 2017; 4: 997-9.
12. FDA Pregnancy Categories. Accessed from <https://www.drugs.com/pregnancy-categories.html>. Accessed on, August 30, 2018.
13. Anatomical Therapeutic Chemical (ATC) Classification. Accessed from http://www.who.int/medicines/regulation/medicines-safety/toolkit_atc/en/. Accessed on
14. WHO Drug Prescribing Indicators. Accessed from <http://apps.who.int/medicinedocs/en/d/Js2289e/3.1.html>. Accessed on, August 30, 2018.
15. Das B, Sarkar C, Datta A, Bohra S. A study of drug use during pregnancy in a teaching hospital in western Nepal. Pharmacoeconomics Drug Safety, 2003; 12: 221-5
16. Fidler S, Barger D. Medication Safety in Obstetrics. American society of health care risk management, 2011; 3: 5.
17. Jain S, Upadhyaya P, Goyal J, et al. A systematic review of prescription pattern monitoring studies and their effectiveness in promoting rational use of medicines. Perspectives in Clinical Research, 2015; 6(2): 86-90. doi:10.4103/2229-3485.154005.
18. Lagoy CT, Joshi N, Cragan JD, Rasmussen SA. Report from the CDC: Medication use during pregnancy and lactation: an urgent call for public health action. J Womens Health, 2005; 14(2): 104-9.
19. Lo WY, Friedman JM. Teratogenicity of recently introduced medications in human pregnancy. Obstet Gynecol, 2002; 100(3): 465-73.
20. Adam MP, Polifka JE, Friedman J. Evolving knowledge of the teratogenicity of medications in human pregnancy. Am J Med Genet C Semin Med Genet, 2011; 157: 175-82.
21. Parisi MA, Spong CY, Zajicek A, Guttmacher AE. We Don't Know What We Don't Study: The Case for Research on Medication Effects in Pregnancy. Am J Med Genet C Semin Med Genet, 2011; 157C(3): 247-50
22. Chan M, Sutcliffe A, Wong I. Prescription drug use in pregnancy: more evidence of safety is needed. The Obstetrician and Gynaecologist, 2012; 14: 87-92.
23. Daw JR, Hanley GE, Greyson DL, Morgan SG. Prescription drug use during pregnancy in developed countries: a systematic review. Pharmacoeconomics Drug Saf, 2011; 20(9): 895-902.
24. Daw JR, Mintzes B, Law MR, Hanley GE, Morgan SG. Prescription Drug Use in Pregnancy: A Retrospective, Population-Based Study in British Columbia, Canada (2001-2006). Clin Ther., 2011.
25. Stephansson O, Granath F, Svensson T, Haglund B, Ekblom A, Kieler H. Drug use during pregnancy in Sweden—assessed by the Prescribed Drug Register and the Medical Birth Register. Clin Epidemiol, 2011; 3: 43-50.
26. Mitchell AA, Gilboa SM, Werler MM, Kelley KE, Louik C, Hernández-Díaz S. Medication use during

- pregnancy, with particular focus on prescription drugs: 1976–2008. *Am J Obstet Gynecol*, 2011; 205(1): 51.e1–e8.
27. Bjorn AM, Norgaard M, Hundborg HH, Nohr EA, Ehrenstein V. Use of prescribed drugs among primiparous women: an 11-year population-based study in Denmark. *Clin Epidemiol*, 2011; 3: 149–56. Epub 2011/05/25.
 28. Joseph K, Fahey J, Dendukuri N, Allen V, O'Campo P, Dodds L, et al. Recent changes in maternal characteristics by socioeconomic status. *JOGC*, 2009; 31(5): 422–33.
 29. Engeland A, Bramness JG, Daltveit AK, Rønning M, Skurtveit S, Furu K. Prescription drug use among fathers and mothers before and during pregnancy. A population-based cohort study of 106 000 pregnancies in Norway 2004–2006. *Br J Clin Pharmacol*, 2008; 65(5): 653–60.
 30. Lacroix I, Hurault C, Sarramon M, Guitard C, Berrebi A, Grau M, et al. Prescription of drugs during pregnancy: a study using EFEMERIS, the new French database. *Eur J Clin Pharmacol*, 2009; 65(8): 839–46.
 31. Gagne JJ, Maio V, Berghella V, Louis DZ, Gonnella JS. Prescription drug use during pregnancy: a population-based study in Regione Emilia-Romagna, Italy. *Eur J Clin Pharmacol*, 2008; 64(11): 1125–32.
 32. Sharma R, Kapoor B, Verma U. Drug utilization pattern during pregnancy in North India. *J Med Sci.*, 2006; 60: 277–87.
 33. Misra A. Prescribing pattern of antimicrobials in the in patients department of obstetrics and gynaecology at a tertiary care teaching hospital at Nepal. *Int J Pharm Biol Arch*, 2014; 4(5): 893-8.
 34. Sasidharan P, Kolasani BP, Divyashanthi CM. An observational prospective study on prescribing pattern of drugs among pregnant women admitted in antenatal ward of a tertiary care teaching hospital in coastal town of South India. *Natl J Physiol Pharm Pharmacol*, 2017; 7(1): 25-31.
 35. Zhu X, Qi X, Hao J, Huang Z, Zhang Z, Xing X et al. Pattern of Drug Use During the First Trimester among Chinese Women: data from a population based cohort study. *Eur J Clin Pharmacol*, May, 2010; 66(5): 511–18.
 36. National List of essential Medicines (NLEM 2015). Accessed from <http://cdsco.nic.in/WriteReadData/NLEM-2015/NLEM,%202015.pdf>. Accessed on, August 30, 2018.