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**DRUG UTILIZATION STUDY AND MORBIDITY PATTERN IN INDOOR PATIENTS AT TERTIARY CARE HOSPITAL IN HIGH RISK PREGNANCY : PREGNANCY INDUCED HYPERTENSION, OLIGOHYDRAMNIOS, INTRAUTERINE GROWTH RETARDATION & DIABETES MELLITUS.****Healthcare****Dr. Sanjay Rathod**

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ABSTRACT

Background: Pregnancy represents a special physiological state during which the use of drug is of growing concern due to risk of teratogenicity. High risk pregnancy is common threat to mother and foetus. Therefore, our aim was to study the drug utilization and morbidity pattern in high risk pregnancy in hospitalized pregnant women. **Methods:** An observational, prospective study was carried out in 150 patients for 12 months in the tertiary care hospital. Protocol was approved by the Institutional IEC (Intitutional ethics committe). The data were collected in a pre-designed proforma. Data were analysed by using Microsoft excel 2021 & Graphpad prism software 2021. **Results:** Among 150 patients, 5 (3.3%), 103 (68.7%) and 42 (28 %) were of less than 20, 20 to 30 and more than 30 years of age respectively. About 50.7 % women had complained of abdominal pain and 36.7 % had pedal oedema followed by headache (29.3%), weakness (12.7%) and cough (8 %). Folic acid (84.7 %) and ferrous sulphate (83.3 %) were the commonest drugs prescribed followed by calcium carbonate (73.3%), vitamin B complex (70.7%), labetalol (65.3%) and protein powder (44 %). As per FDA Drug Risk Category, Category-A (45.1%) was most frequently prescribed followed by Category-B (27.3%) and Category-C (26.5 %). Percentage of drugs prescribed by generic name and from essential drug list was 71.5% and 89.5%. **Conclusion:** Folic acid, ferrous sulphate and calcium carbonate were most commonly prescribed drugs. There is more number of drugs prescribed by generic name.

KEYWORDS

Drug utilization, High risk pregnancy, WHO core drug prescribing indicators

INTRODUCTION

A pregnancy is defined as high risk' when there is a likelihood of an adverse outcome to woman and/ or to the baby that is greater than the incidence of that outcome in general pregnant population¹. List of condition that place pregnancy at high risk' are anaemia, hypertension, diabetes, cardiac disease, multiple pregnancies, oligohydramnios, intra uterine growth retardation, ante partum haemorrhage, eclampsia, post dated pregnancy, human immune deficiency virus infection , asthma and others.

High risk pregnancy is major cause of maternal mortality all over the world² complications occur in 15 % pregnancy world wide³. Around 830 die of pregnancy complications every day (2015)⁴. More than 303000 women died as a result of pregnancy complication (2015)⁴. Maternal mortality is not acceptable.⁵

Drugs play an important role in improving human health & promoting well being. However to produce desired effect, they has to be safe, efficacious & have to be used rationally. Safe and efficacious use of drugs prevents mortality & morbidity in mother & foetus¹. Hence to study morbidity pattern and drug use pattern in high risk pregnancy is necessary.

Recent studies suggest that high-risk pregnancy is quite prevalent & affect about one-third of pregnant women¹³. Drug use in pregnancy have been analyzed by different researchers mainly in western world but not in developing countries like India¹⁵. High risk pregnancy is common threat to mother and foetus. Despite of this, there is paucity of drug -utilization studies in high risk pregnancy in India¹³. Hence we want to conduct drug utilization study and morbidity pattern in high risk pregnancy at tertiary care hospital.

METHODS

The present study was carried out in obstetrics and gynecology department at a tertiary care teaching hospital in Mumbai, India during 12 months period from June 2019 to June 2020. All the patients admitted to obstetrics department were included in our study. The protocol and other documents like proforma, patient information sheet and informed consent form in English, Hindi and Marathi were approved by Institutional Ethics committee (IEC). The study was started after getting written approval from IEC.

The data was collected from all the patients irrespective of age in a pre-designed proforma after taking written informed consent from the patients. The proforma includes patient's demographic details, indoor number, pregnancy duration, provisional diagnosis / chief complaints, investigations and complete prescription. Data of all the 150 patients

were analysed by using Microsoft excel 2021 & Graphpad prism software 2021.. Prescription pattern was evaluated by using WHO core drug prescribing indicators and US-FDA Drug Risk Category.

RESULTS:

The demographic data concerning the age of the study population shows that out of total 150 pregnant women, 5 (3.3%), 103 (68.7%) and 42 (28 %) were of less than 20, 20 to 30 and more than 30 years of age respectively (Figure 1). Out of 150, 2 (1.3%), 8 (5.3%) and 140 (93.3%) patients were admitted during 1st, 2nd and 3rd trimester of pregnancy respectively (Figure 1). 51(34%) and 99 (66%) patients were primiparous and multiparous respectively. Disease pattern showed that, PIH (73.3%) was commonest followed by diabetes (21.3%), oligohydramnios (8%), ante IUGR (6%), (Figure 2). About 50.7% women have complaint of abdominal pain and 36.7% had pedal oedema followed by headache (29.3%), weakness (12.7%), cough (8%) and vaginal discharge (6.7%).(Table 1). Average number of drugs prescribed was 5.8±1.4 (Figure 3). Number of drugs varies with each trimester. In first trimester, 10 drugs prescribed to 2 patients with mean 5±0. In second trimester, 8 patients received 44 drugs with mean 5.5±1.72. In third trimester, 140 patients received 828 drugs with mean 5.9±1.77. (Table 2). Thirteen frequently prescribed drugs were folic acid (84.7%), ferrous sulphate (83.3%), calcium carbonate (73.3%) and vitamin B complex (70.7%) followed by labetalol (65.3%), protein powder (44%), vit.C (41.3%), nifedipine (32%), MGSO4 (23.3%), metformin (15.3%), human regular insulin (14.7%), dexamethasone (12.7%) and paracetamol (11.3%) (Figure 4).

In the first trimester folic acid (100%) was most frequently prescribed followed by antiemetic drugs (50%), miconazole (50%). In the second trimester folic acid (100%), iron (100%) were most commonly prescribed followed by calcium (87.5%), MVBC (75%), protein powder (62.5%), vit c (37.5%), labetalol (37.5%), arginine granules (37.5%), MGSO4 (25%), metformin (25%). In the third trimester folic acid (78.7%), iron (78%), and calcium (68.7%) were most frequently prescribed followed by MVBC (64%), labetalol (64%), vit c (39.3%), protein powder (39.3%), nifedipine (31.3%), MGSO4 (22.7%) and metformin (14%) (Table 3). PIH patients, labetalol was given to 104 (94.5%) patients. It was given in 100 mg orally twice or thrice a day according to blood pressure. Nifedipine was prescribed to 51(46.4%) patients. Most of patients were given 10 mg twice a day orally and dose was adjusted according to blood pressure. Magnesium sulphate was prescribed to 35 (31.8%) patients who had severe or impending eclampsia, with a dose of 4 gm I.V. diluted in 12 ml normal saline and 10 gm intramuscular with 5 gm in each buttock. Arginine sachet contains arginine amino acid was prescribed to 12 (8%) patients orally once a day according to severity of oligohydramnios. Arginine sachet

was prescribed to 9 (6%) patients orally once a day according to severity of IUGR.

Out of 32 (21.3%) patients of diabetes, insulin (either human regular, or insulin I) was given subcutaneously according to blood sugar and diabetic profile to all patients. Both short acting and intermediate acting insulin was given. Metformin (75%) was most commonly followed by human regular insulin (68.8%) and insulin I (40.6 %) in diabetes mellitus patients. Combination of metformin & human regular insulin was given to 12 (40.6 %) and metformin & Insulin I combination to 8 (25 %) patients.

In the present study majority of drugs were from category A 45.1% which is the safest category followed by category B 27.3% ,category C 26.5% and category D 1.0% (Figure 5). World Health Organization (WHO) has given three types of indicators namely prescribing indicators, patient care indicators and facility indicators as determinant of rational prescribing. Out of this, in the present study, only prescribing indicators has been used. (Table 4).

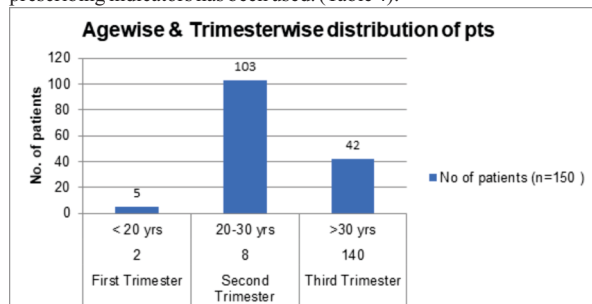


Figure 1

Disease pattern among high risk patients

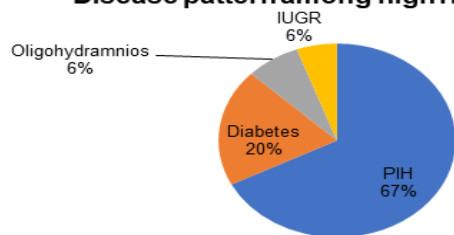


Figure 2

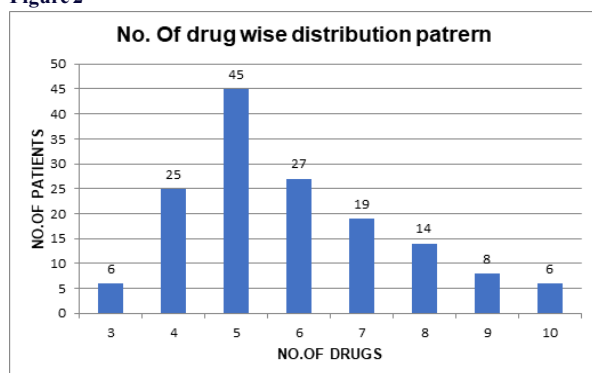


Figure 3

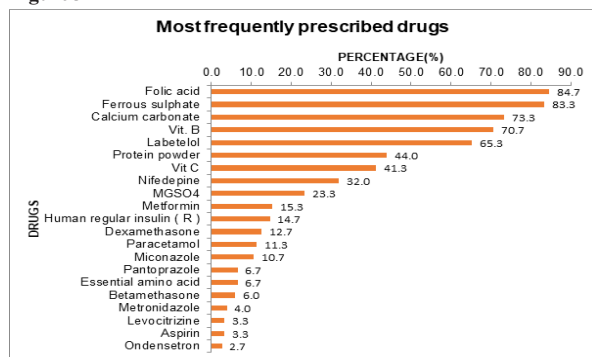


Figure 4

Table 1. Morbidity Pattern

Sr. No	Morbidity pattern	No of patients	Percentage
1	Abdominal pain (Pain in abdomen)	76	50.7
2	Pedal oedema	55	36.7
3	Headache	44	29.3
4	Weakness	19	12.7
5	Cough	12	8
6	Vaginal discharge	10	6.7
7	Giddiness	9	6
8	Decreased foetal movement	8	5.3
9	Bodypain (Bodyache)	7	4.7
10	Itching in vagina	6	4
11	Vomitting	4	2.7
12	Polyurea	3	2

Table 2

TRIMESTER	NO. OF PATIENTS	NO.OF DRUGS	MEAN NO. OF DRUGS	STANDARD DEVIATION
FIRST	2	10	5	0
SECOND	8	44	5.5	1.72
THIRD	140	828	5.9	1.77

Table 3

Sr. No	Drugs	First Trimester No of patients (%)	Second Trimester No of patients (%)	Third Trimester No of patients (%)
1	Folic acid	2(100 %)	8 (100 %)	118 (78 %)
2	Ferrous sulphate		8 (100%)	117 (78%)
3	Calcium sulphate		7 (87.5%)	103 (68.7%)
4	Vitamin B complex		6 (75%)	96 (64%)
5	Labetelol		3(37.5%)	96 (64%)
6	Protein powder	2 (100 %)	5 (62.5%)	59 (39.3%)
7	Vit. C		3 (37.5)	59(39.3%)
8	Nifedipine		1 (12.5)	47(31.3%)
9	MGSO4		2 (25)	34 (22.7%)
10	Metformin		2(25%)	21(14%)
11	Human regular insulin	2 (100%)	-	20 (13.3%)
12	Dexamethasone		-	19 (12.7%)
13	Paracetamol		-	17(11.3%)
14	Miconazole	1(50 %)	-	-
15	Pantoprazole			-
16	Arginine		3 (37.5%)	

Table 4

Sr. No.	Prescribing Indicators	Value
1	Average number of drugs per encounter	5.8
2	Percentage of drugs prescribed by generic name	71.5
3	Percentage of patients with an antibiotic prescribed	8.7
4	Percentage of drugs prescribed in injection form	50.7
5	Percentage of drugs prescribed from hospital drug list	88.9
6	Percentage of drugs prescribed from essential drug list	89.5

DISCUSSION

In the present study, the demographic data demonstrated that baseline study population was comparable to earlier study done in a study done in India, in which 75 % of women were under 30 years of age which is similar to our study (Gaidhankar SL. et.al.)¹³. This is in accordance with the study carried out in Australia (Tim Badgery- parker et al.)¹⁸ showed women less than 20, 20 to 30 and more than 30 years of age were 4%, 70% and 26% respectively. In both studies, it was observed that the majority of the women were between 20 to 30 years of age group which represent the normal reproductive age group.

Out of 150, 2 (1.3%), 8 (5.3%) and 140 (93.3%) patients were admitted 1st, 2nd and 3rd trimester of pregnancy respectively. We had taken only high risk patients and majority of high risk conditions appeared in third trimester which causes threat to mother and fetus. This finding is similar with previous study (Gaidhankar SL. et.al.)¹³ in which most of patients were in third trimester were 81.72 %. In the present study, average number of drugs prescribed was 5.8±1.7 as majority of

patients had more than one disease. Folic acid, Ferrous sulphate, Calcium carbonate and Vitamin B complex were commonly used along with treatment of high risk condition. Number of drugs varies with each trimester. In first trimester, mean number of drugs prescribed were 5.0 ± 0 . Most of drugs have teratogenic effects in first trimester so average number of drugs per patient is less than other trimesters. In second trimester mean no. of drugs were 5.5 ± 1.72 . In third trimester mean number of drugs were 5.9 ± 1.77 .

Oligohydramnios, and IUGR were common in third trimester. On applying the Kruskal-Wallis Test (non-parametric ANOVA) $Kw=12.321$ and the mean number of drugs during different trimesters were not significant ($P=0.940$ at 99% confidence interval).

Poor dietary status reflected by low socio-economic status makes micronutrient deficiency both clinical and sub clinical.¹⁹ Repeated pregnancy is also contributing factor for poor nutritional status of the mother. All these factors deplete the micronutrient stores of the mother, to the extent that she becomes anaemic even in the first trimester. This brings adverse outcome for mother and foetus.^{20,21} Hence in our study iron, calcium, vitamin B complex, and protein powder were given to 83.3%, 73.3%, and 70.7% patients (Figure 4). Preconception folic acid supplementation can prevent neural tube defects and other congenital abnormalities of the cardiovascular system, urinary tract and limb deficiencies of foetus.²² So folic acid was prescribed to 84.7% patients. Vitamin C increases the absorption of iron from non-animal foods such as spinach and also plays a role in the storage of iron in major organs like liver.²³ Vitamin C therefore aids the body in the efficient use of folic acid and iron.²⁴ Vitamin C was prescribed to 41.3% patients in our study. In our study, 50.7% women have complained of abdominal pain and 36.7% had pedal oedema followed by headache (29.3%), weakness (12.7%) and cough (8%). These finding is different than previous done in Kathmandu 25 where dizziness (60.9%), excessive vomiting (56.2%), swelling of hands and feet (36.9%) and fever (20%) was common.

In PIH, the most commonly prescribed antihypertensive agents given were labetalol (94.5%), nifedipine (46.4%), and Mgso4 (31.8%). These was different than previous study in which methyldopa (35.1%), was most commonly prescribed followed labetalol 20.8% and nifedipine (16.9%) (Deb T. et al.)²⁶ Magnesium sulphate was given to those patients, which were suffering from eclampsia. This is similar with previous study done in Canada done by Proctor L. et. at.²⁷ Wherever needed, a combination of drugs was used for better reduction in blood pressure. This improves patient compliance and decreases PIH with fewer adverse events.²⁸

Oligohydramnios has also been treated with amino acid arginine. Daily intravascular foetal nutrition may significantly improve both foetal condition and foetal weight gain in oligohydramnios. Now a days metformin and glyburide used for treatment of gestational diabetes, but high numbers of patients need to discontinue and switch over to insulin.²⁹ In our study insulin was given to all patients of gestational diabetes. As per guidelines, insulin combination of short and intermediate acting insulin was used in all 32 patients. Comparing the drug risk categories for pregnancy, introduced by US food and drug administration (FDA), in the present study majority of drugs were from category A 45.1% which is the safest category followed by category B 27.3% category C 26.5% and category D 0.00%. No drug were prescribed from category X which are absolutely contraindicated in pregnancy (Figure 5). The similar pattern of category distribution was not seen in the study done in Netherland in which drugs from category A were 81.7%, category B, 10.9%, category C, 6.3%, category D, 1.1% and category X 0.0% (Bakker MK. et al.)³⁰

There are reports of use of potentially harmful drug from category X during pregnancy from developed and underdeveloped countries of the world.³¹ In a retrospective, register cohort based study in Finland, it was found that 20.4% of women purchased at least one drug classified as potentially harmful during pregnancy and 3.4% purchased at least one drug classified as harmful (Malm H. et al.)³². In a study from Bratislava and Nitra, it was reported that a vast majority of prescribed drugs during pregnancy, belonged to category C.³³ So from the above data we can say that the prescription habit in our study is quit safe.

Percentage of drugs prescribed by generic name is 71.5%. This shows a greater tendency to prescribe by generic name rather than by brand name. Most of the patients attending the teaching hospitals belong to

the lower socio economic classes, so tendency to prescribe by generic name may influence the compliance of patients by affecting the cost. Percentage of encounters with antibiotic prescribed is 8.7% mainly due to respiratory tract infection during pregnancy. Amoxicillin is used in such conditions. Percentage of encounters with an injection prescribed 50.7%. Injectable preparations are used for eclampsia and diabetes. Percentage of drugs prescribed from essential drugs list is 89.5%. As high rates of drugs prescribe from essential drugs list, it suggests rationality of drug use pattern. Percentage of drugs prescribed from hospital drug list is 88.9%. Around 11% of drugs were prescribed from outside the hospital. The reason may be unavailability of the necessary drugs in hospital pharmacy.

CONCLUSION

Abdominal pain and pedal oedema were commonest complaints. Disease pattern showed PIH and diabetes were commonest. Overall prescribing habit in this set-up is appropriate and rational to a large extent. But there is lesser number of drugs prescribed by generic name suggesting need for sincere efforts to improve situation. This is the preliminary study and further studies are required to find out broader evaluation of the hypolipidemic agents. Hence, such periodic studies are further required in diverse environment, social, educational and cultural conditions, so that the therapeutic guidelines could be revised accordingly to give proper care to the community.

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Conflict Of Interest: No conflict of interest

Ethical Approval: The study was approved by the Institutional Review Board

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