ejpmr, 2014, 1(1), 13-34

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

DRUG PRESCRIBING PATTERN AND ITS POTENTIAL FETAL HARM AMONG PREGNANT WOMEN IN BISHOFTU GENERAL HOSPITAL, OROMIA REGIONAL STATE, ETHIOPIA

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Article Received on 02/09/2014 **Article Revised on 22/09/2014** **Article Accepted on 15/10/2014**

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ABSTRACTS

Background: Prescribing drugs to pregnant women requires the balancing benefits and risks. Only a small proportion of drugs are known to be harmful to the fetus, but for the vast majority of drugs little evidence of fetal safety exist. **Objective:** To assess the pattern of drug prescribing and its potential fetal harm among pregnant women in Bishoftu General Hospital, Oromia region, Ethiopia. **Methods:** All drug prescriptions of pregnant women prescribed from March, 2013 to March, 2014 were reviewed retrospectively using structured data collection format. **Result**: A total of 262 pregnant women prescriptions were in included in the study. The average maternal age in the study was 27.37 years. The rates of first trimester, second trimester and third trimester pregnancy term were 69 (26.34%), 112 (42.75%) and 81 (30.91%), respectively. The average numbers of drugs prescribed per pregnant women was found to be 1.63. To prevent anemia and vitamin deficiency in pregnancy 241(91.98%) was the most common reason for medicine usage followed by to alleviate pains 45(17.17%). Mineral and vitamin 241 (56.31 %) were the most frequently prescribed drugs followed by antibiotics 60(14.02 %) and analgesics 45(10.51 %). Out of 428 drugs prescribed, 62.85% were FDA drug risk category A, 20.56% category B, 11.68% category C, 3.27% category D and 1.64% to category X. **Conclusion:** Iron and folic acid were the most frequently prescribed drugs. Prescription pattern during pregnancy in the hospital is encouraging except few drugs.

KEY WORDS: Drugs, pregnancy, mineral and vitamins.

1. INTRODUCTION

1.1 Background

Pregnancy is the period from conception to birth when developing fetus carried in women uterus. Pregnancy is divided into three equal periods which are called trimesters. Each trimester consists of about 13 weeks. Pregnancy is special physiological conditions, where drug treatment presents special concern [1]. Pregnancy care is one of the great challenges in medicine. Drug therapies and protocols may affect the life of mothers and babies. Diseases occurring during pregnancy are even more dangerous, because of the difficulties in their treatment strategy. Prevention must be emphasized using safe and natural drugs [2].

Medication use during pregnancy has been an issue of concern since the discovery of birth defects resulting from Thalidomide use in early pregnancy during the 1960s. Pregnancy management using medications has been challenging to both health care providers and pregnant women, given the fear of teratogenicity effects and the potential for fetal harm. This increased burden of risk assessment for providers, when treating pregnant women, can significantly impact therapeutic decision making [3].

To guide safe drug use during pregnancy, the U.S.A. Food and Drug Administration (FDA) classified drugs into the following major categories; A, B, C, D, and X with categories D and X indicating evidence of risk in pregnancy [4].

Hence, the authors used the FDA drug category for pregnant women, FDA currently uses system of pregnancy categories based on the degree to which available information has ruled out risk to the fetus, balanced against the drug's potential benefits to the patient [5]. Information on the use of drugs during pregnancy is scarce and rather anecdotal [1]. Studies on side effects of drugs have traditionally focused on the potential teratogenic effects. However drugs and other chemicals may also influence fetal wellbeing at other times. For example, the use of angiotensin converting enzymes (ACE) inhibitors may cause prolonged fetal hypotension, renal tubular dysplasia, growth retardation, and death when in the second and third trimesters of pregnancy [6].

NSAIDs may impair fertility by interfering with ovulation, fertilization, and implantation [7] and their use during the last trimester has been associated with increased fetal risk [8] such as premature closure of the ductusarteriosus [7].

Frequent maternal use of paracetamol during pregnancy may be associated with wheezing and asthma in early childhood and an increase in fetal death or spontaneous abortion [7] may be seen following maternal overdose of paracetamol if treatment is delayed. Little is known about drugs with central nervous system activity and their possible long-term effects on the developing brain [9].

Regardless of the limited information on the safety of drugs in pregnancy, drug use in pregnancy is common. Supplementary drug treatment, iron, folic acid, calcium, vitamins are prescribed commonly to improve overall nutritional status of mother and fetus. In addition drugs may also be prescribed for conditions not related to pregnancy such as upper respiratory infections, urinary tract infections and gastrointestinal infection 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, gestational diabetes [10]. Therefore, judicious use of drugs, adequate knowledge, positive approach and awareness towards the drug use are mandatory prerequisites for good maternal and child health [11].

The primary objective of a drug prescribing pattern study is to facilitate rational use of drugs. Rational use of a drug implies the prescription of a well-documented drug in an optimal dose for the right indication, with the accurate information and at a reasonable price. Without knowledge on how drugs are being prescribed and used, it is difficult to initiate a discussion on rational drug use and to suggest measures to change prescribing practices for the better [12].

It therefore becomes essential to assess the drug prescribing pattern in pregnancy to see to what extent there may be scope for improvement in the current clinical practice. In Bishoftu general hospital (BGH), there is no such study before for the safety and effectiveness of drug prescribed during pregnancy. Keeping this in mind this study was planned to assess drug prescribing pattern among pregnant women in BGH and describe the pregnancy risk level of medications prescribed during pregnancy according to the US-FDA pregnancy risk classification of drugs.

1.2 Statement of problem

Pregnancy management using medications has been challenging to both health care providers and pregnant women, given the fear of teratogenic effects and the potential for fetal harm.

Diseases occurring during pregnancy are even more dangerous, because of the difficulties in their treatment strategy [3].

It has been estimated that over 90% of expectant mothers take between three to four drugs at some stage of pregnancy. Approximately 2-5% of all live births are associated with a congenital birth defect and it has been estimated that about 1-3% of birth defect are thought to be caused by medication use in pregnancy. These averages may be higher among Ethiopian women due to our numerous cultural beliefs and high level of illiteracy [13].

Pregnant women are generally excluded from clinical trials [14] Safety information regarding drug use in pregnancy is gathered through case reports, epidemiological studies and animal studies, all of which have limitations. Results from animal studies cannot always be extrapolated in human population [4].

Despite the absence of adequate studies on the safety and effectiveness of prescription drugs for pregnant women, evidence available shows that physicians prescribe, and pregnant women take a surprisingly large number of drugs. An international investigation sponsored by WHO showed that pregnant women ingest an average of three prescription medications during pregnancy (range 1-15). Furthermore, 86% of the women had taken at least one prescription medication during their pregnancies .this may lead to adverse reproductive outcomes, due to potential risk to the mother and the fetus [15].

In contexts of most developing countries including Ethiopia, it is difficult to elucidate medications use prevalence during pregnancy and their relative contributions to birth defects for several reasons [7]. As result, studies conducted in developed countries where drug prescribing practices are considered to be better have identified need for interventional measures aimed at rational prescribing during the prenatal period [16]. Thus, medications use by pregnant women should be viewed as a public health issue due to numerous gaps in knowledge about deleterious consequences of medications on the fetus [17].

The adverse reproductive outcomes, due to potential risk to the mother and fetus can be reduced by creating awareness and bringing a good prescribing pattern among health professionals. Hence, the aim of this study was to assess prescribing pattern and its potential fetal harm among pregnant women attending BGH, Ethiopia. This study also provided a base line data for further studies and intervention.

1.3 Significance of study

Owing to the paucity of evidence available on the risks and benefits of drug use in pregnancy, the use of prescription medicines is a concern for both pregnant women and their health care providers. Hence the aim of this study was to examine the patterns of drug prescription during pregnancy in the BGH of Bishoftu. With this information, we intend to provide feedback and recommendations for the health care providers.

This study also helps pregnant women and policy makers by providing the magnitude of prescribing pattern and its fetal harm among pregnant women in the hospital. This study is also important for us to develop scientific knowledge and skill on how to conduct a research.

2. OBJECTIVE

2.1 General objective

-To assess the drug prescribing pattern and its potential fetal harm among pregnant who attend BGH.

2.2 Specific objectives

-To determine the frequency and average number of drugs used in pregnancy

-To determine the commonest reasons for drug usage in pregnancy

-To determine the safety of medicines used in pregnancy

-To determine the commonest classes of medicines used in pregnancy

-Based on the study finding to forward practicable recommendations for health care providers.

3. METHODOLOGY

3.1 Study area and period

This study was conducted in Bishoftu general hospital among pregnant women from February 2014 GC to May 2014 GC. Bishoftu general hospital is one of the largest governmental hospitals in Ethiopia. Bishoftu general hospital is located 47 km east of Addis Ababa (capital city of Ethiopia). Only during last year Bishoftu general hospital serves about 144990 patients.

3.2 Study design

A retrospective cross sectional study design was used by reviewing patient case paper prescribed from March 2013 GC to March 2014 GC.

3.3 Source of population

All patients came to BGH, ANC follow up, ambulatory, internal medicine as well as psychiatric, unit and prescribed with at least one drug.

3.4 Study population

All pregnant women attending the antenatal clinic, psychiatry clinic, ambulatory clinics, and internal medicine ward (female medical ward) and gyn/obs ward and took at least one drug during study period fulfilling inclusion criteria.

3.5. Eligibility criteria

3.5.1 Inclusion criteria

New women came for ANC and those who were already enrolled in routine ANC program, women who were treated for co morbidities at psychiatry and chronic illness clinics and female medical ward, and prescribed with at least one drug.

3.5.2 Exclusion criteria

Women who were not pregnant and were not prescribed with at least one drug.

3.6 Sample size determination

The sample size is calculated using single population proportion formula as follows.

$n = \frac{z^2 p(1-p)}{d^2}$ Where

n= desired sample size for population>10,000

Z= standard normal duration usually set as 1.96 (which corresponds to 95% confidence level)

P= since there was no study done previously, we use positive prevalence estimated (50%) =0.50 to maximize sample size.

d= degree of accuracy desired (marginal error) is 0.05 then, the sample size is

$n = \frac{(1.96)^2}{(.05)^2}(.50)(0.5)$

$n = 384$ Since the total population is <10,000 that is 823, we use the correction formula to determine final sample size $nf = {ni}/{(1 + \frac{n}{N})}$

n_f=384/1+(384/823)

n_f=262

n_f= final sample size when a population is < 10,000

n_i = initial sample size when the population is >10,000

N= target (source) population.

3.7 Sampling technique

After sample size determined, we use systematic random sampling technique as follows. Then by using systematic random sample

- First numbering the patients card from 1,2.....823
- Second we determined sampling interval by

K= Total population

Determined sample size

$K = {}^{823}/_{262}$= 3.1 =3

- Third then we have selected number =2 by lottery method from 1,2&3 (starting point)
- Fourth then starting from 2 every 2 pregnant women`s card was reviewed. i.e. 2, 4, 6, 8, ... 823
- Totally, 262 case papers were reviewed.

3.8 Data collection method and tool

Data was collected by reviewing patient case paper and required information was recorded using a structured data collection sheet prepared for study.

3.9 Data processing and analysis

The collected data was sorted and classified in accordance with US FDA risk classification for pregnancy.

3.10 Data quality assurance

In order to prevent bias, the prescriber was kept unaware about collection of prescription.

3.11 Operational definitions

Antenatal: During the period between conception and child birth.

Gestational age: The interval, in completed weeks, between the first days of the Mother's last menstrual period and the day of delivery (that is, the duration of pregnancy).

Pregnancy: The period from conception to birth

Prescription: A physician`s order for the preparation and administration of a drug or device for a patient.

Teratogen: Any chemical or biological exposure that can have an adverse effect on a developing fetus.

Trimester: In obstetrics, one of the three divisions of three months each during pregnancy, in Which different phases of fetal development take place.

3.12. Study variables

3.12.1 Independent variables

- Socio-demographic variable

3.12.2 Dependent variables

- Gestational age
- Drug prescribed
- Number of drugs prescribed
- Class of drug prescribed
- Reason for use of medicine
- Route of administration

3.13 Ethical considerations

Research on pregnant women raises a unique set of ethical concerns. Therefore, before data collection the ethical approval and clearance for the study was obtained from Ambo University, college of health science, department of pharmacy.

3.14 Limitation of study

The limitation of this study could be the fact that other hospitals including private hospitals and health centers were not included.

4. RESULTS AND DISCUSSION

4.1 Socio-demographic data

A total of 262 patient cards (for pregnant women) were collected and assessed during the study period (February, 2014 to May, 2014). Demographics obtained showed that the average age was 27.37years. The dominant age-group was women between 24 to 32 years, which represents 58.02% of pregnant women`s card accessed. Most of the pregnant women were in their second trimester of pregnancy; these represent 42.75 % of the pregnant women.From a total pregnant women included in the study were primigravidae 74 (28.24%), secundigravidae 97 (37.03%), multigravidae 89 (33.97%), while in 2 cases (0.76%) the gravidity was not indicated.

Table1: Age group of pregnant women in Bishoftu general hospital, May, 2014 (N=262)

Age range (in years)	Frequency	Percentage
15-23	73	27.86
24 -32	152	58.02
33-40	30	11.45
41-50	7	2.67
Total	262	100

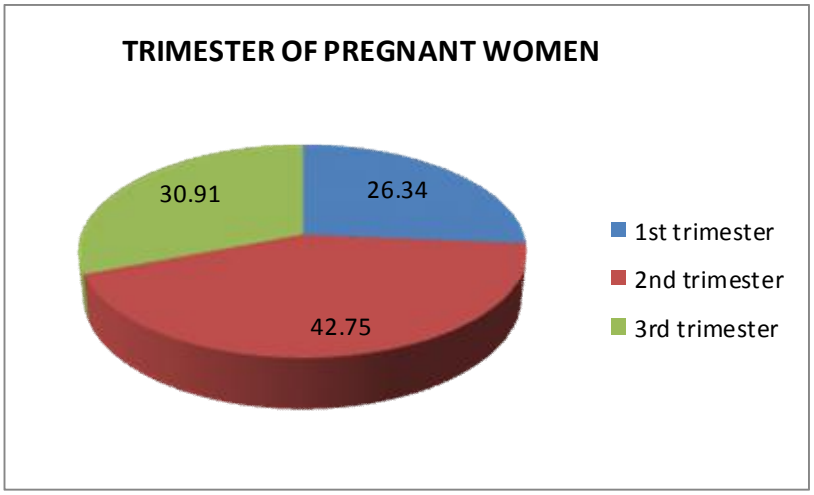

Figure 1: Gestational age of pregnant women at BGH and percentage of occurrence May, 2014(N=262)

Table: 2 Gravidity of pregnant women in Bishoftu general hospital, May, 2014 (N=262)

Gravidity	Frequency	Percentage
Primigravidae	74	28.24
Secundigravidae	97	37.03
Multigravidae	89	33.97
Not indicated	2	0.76
Total	262	100

The average maternal age obtained in this study was greater than obtained in study in Adama (26.74) [1] and less than that obtained in Palestine (28.1) [17]. Majority of patients in the study were in second trimester of gestation (42.75%) followed by third trimester (30.91%) and first trimester (26.34%). Secundi-gravid women formed the majority of the women attending hospital.

4.2 Prescribing pattern and its potential fetal harm data

To prevent anemia and vitamin deficiency in pregnancy 241(91.98%) is the most common reason for medicine usage followed by to alleviate pains 45(17.17%). And respiratory infections accounts 23(8.79%) while gastro intestinal infections 19(7.25%).

Table 3: Reason for medicine usage among pregnant women in Bishoftu general hospital, May, 2014 (N=262)

Reason for medicine usage	Frequency	Percentage
To prevent anemia and vitamin deficiency in pregnancy	241	91.98
As pain killer	45	17.17
To treat Respiratory infections	23	8.79
To manage Gastro intestinal infections	19	7.25
To treat Genitourinary infections	14	5.34
To suppress nausea /vomiting	9	3.44
To treat hypertension	8	3.05
To treat Malaria	4	1.53
To manage Topical problems	3	1.15
HIV/AIDS	3	1.15
Helmentics	3	1.15
Other	11	4.19
Total	351	146.19

Note that the total percentage was greater than 100% because pregnant women may diagnose with more than one disease.

The reason for medicine usage obtained in this study was similar to that reported in Dormaa Presbyterian study [13] where drugs were mainly used to prevent anemia and vitamin deficiency during pregnancy. To alleviate pain were second reason for medicine usage among these pregnant women which was similar to a Pakistan study [18]. To treat respiratory infection was third common reason for drug usage which was also second most prevalent disease in study done Nigeria [21].

A total of 357 prescriptions were obtained from the 262 medical case files. The average number of drugs per pregnant women was found to be 1.63 (range 1 – 4). Percentage of drugs prescribed by generic name was 96.58% and the Percentage of encounters with antibiotic prescribed was 14.02%. Percentage of encounters with an injection prescribed was 10.51%. Forty seven different drugs were encountered. Percentage of drugs prescribed from hospital drug list was 99.98%.

Table: 4 Prescribing indicator for pregnant women in Bishoftu general hospital, May, 2014 (N=262)

Prescription indicators	Value obtained	WHO standard
Average number of drugs per pregnant women	1.63	1.6 -1.8
Percentage of drugs prescribed by generic name	96.58	100
Percentage encountered with antibiotics	14.02	20- 26.8
Percentage encountered with injections	10.51	13.4 -24.1
Percentage of drugs prescribed from essential drug list	100	100
Percentage of drugs prescribed from hospital drug list	99.98	100

Average number of drugs per pregnant women in this study was 1.63 which indicates that it was in range of standard set by WHO (1.6-1.8); and less than that reported in India (2.37) and Jizan general hospital (3.3) and Brazil (2.4) [10, 19, 22].

It was found that a much higher proportion of drugs prescribed by generic name in this study (96.58%) than study both in Ahmadabad (21.51%) and Yemen (39.2%) [20,27]. This might be due to continuing education on the principles of rational prescribing and familiarity with generic name of drugs among prescribers. However; there is still room for improvement; since the cost of the patients treatment may be reduced.

The occurrence of injectables in this study was lower than that reported in Hawasa study (38.1%) [28] and lower than standard set by WHO. This is encouraging because the high frequency usage of injectables may introduce high concentration of drug in plasma, which could lead to toxicity in the pregnant women exposed and cause an infection [1].

The prescribing indicators also showed that the percentage encountered with antibiotic was lower than the standard set by WHO and, than report from both Nigeria (88.00%) [21] and Adama(24.00%) [1] but greater than result from Ahmadabad (11.20%) [20]. This is also encouraging, since antibiotics are drugs used for most bacterial infections and this could help to minimize drug resistance problems that could be promoted with over usage of antibiotics [1, 28].

In this study the Percentage of drugs prescribed from essential drug list was 100% that meet the WHO standards; greater than result from Ahmadabad (59%) [20]. As all of drug prescribed from essential drug list; it suggests rationality of prescribing from EDL in the hospital. Percentage of drugs prescribed from hospital drug list was 99.98%, which was higher than result from India (32.50%) [29]; showing adequate drug dispensing from the hospital pharmacy. This indicates that all necessary drugs are available at hospital; which may decrease the overall cost of drug therapy.

Among the total drugs prescribed, most of them (59.11%) were prescribed in tablet form followed by capsules (27.11%) and injection (10.51%).

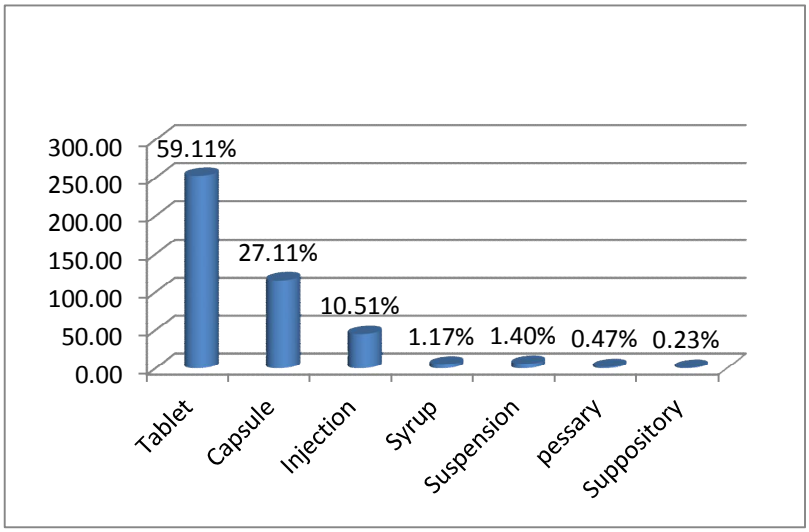

Figure 3: Dosage form of drugs prescribed to pregnant women, Bishoftu, May, 2014

In this study tablet which accounts for (59.11%) were the most frequently prescribed dosage form of drugs followed by capsule (27.11%) and injection (10.51%) which was not similar with report from mekele where injection(75.67%) were most frequently prescribed dosages form followed by tablet(16.76%) and capsule(7.57) [4].

Minerals and vitamins 241(56.31%) were the most frequently prescribed drugs followed by Antibiotics 60(14.02%) and analgesics 45(10.51%). The maximum number of drugs were prescribed in the second trimester 194(45.33%) followed first trimester 137(32.01%) and third trimester 97(22.66%).

Table: 6 Common Classes of drugs prescribed to pregnant women at BGH showing frequency and percentages, Bishoftu, May, 2014 (N=262)

Classes of drugs	Name of drug	Frequency of drugs in each trimester (%)			Total
		1st trimester (69)	2nd trimester (112)	3rd trimester (81)	
Mineral and vitamins	Iron/folic acid, vitamin B-complex, multivitamin	77(56.20)	120(61.85)	44(45.36)	241(56.31)
Analgesics	Paracetamol, diclofenac, tramadol, ibuprofen	12(8.76)	24(12.37)	9(9.28)	45(10.51)
Anti-fungal	Clotrimazole	-	2(1.03)	1(1.03)	3(0.70)
Anti-malaria	Sulfadoxime+Pyrimethamine, quinine, chloroquine	3(2.19)	-	1(1.03)	4(0.93)
Antacid	Magnesium trisilicate, Mg $(OH)_2$ and AL $(OH)_3$. Omeprazole, ranitidine, Cimetidine	7(5.11)	6(3.09)	12(12.37)	25(5.84)
Anti-biotics	Amoxicillin,Ampicillin,gentamycin,ceftriaxone,augmentin,tetracycline,doxcycline	18(13.14)	27(13.92)	15(15.46)	60(14.02)
Anti-emetics	Chlorpromazine, plasil	6(4.38)	1(0.52)	1(1.03)	8(1.87)
Antispasmodic	Hyoscine	-	2(1.03)	1(1.03)	3(0.70)
ART drugs	AZT,3TC,NVP	2(1.46)	1(0.52)	1(1.03)	4(0.93)
Antihelmentics	Mebendazole, piperazine	1(0.73)	2(1.03)	-	3(0.70)
Anti-hypertensive	Aldomet, hydralazine	-	1(0.52)	8(8.25)	9(2.10)
Sedative/hypnotics	Phenobarbital, diazepam, sodium valporate,	2(1.46)	5(2.58)	4(4.13)	11(2.58)
Iv fluids	Normal saline, ringer lactate	9(6.57)	3(1.54)	-	12(2.81)
Total		137	194	97	428

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. By appropriate treatment of conditions like diabetes mellitus and infectious diseases of genital organs, embryopathies, preterm births and abortions could be prevented [30].

In present study, iron, folic-acid and vitamins were the most frequently used drugs in pregnancy similar to study in Trinidad [25]. A similar trend was reported from northen India [24] where folic acid, calcium and vitamins were the most frequently used drug by pregnant women with average at 1.72 to 2.89 drugs per pregnant women.

Phenobarbital, oxytocin, paracetamol, NSAIDs, antibiotics, anti-emetics, proton pump inhibitors/H2 blockers, antacids and antihypertensive drugs (hydralazine, methyldopa) were the other commonly used drugs in our study. Periconceptional folic-acid supplementation can prevent most neural-tube defects and other congenital abnormalities of the cardiovascular system, urinary tract and limb deficiencies [31].

Moreover, folic-acid supplementation in pregnancy is associated with the decreased incidence of habitual spontaneous abortion and pregnancy complications (e.g., placental abruption and preeclampsia) [32]. In the present study iron/folic-acid were prescribed for more than 56.00% of women, the practice that has to be encouraged. A similar trend with drug use in pregnancy was reported from other parts of the world. In a prospective survey in Southwestern Finland, iron and vitamin supplementation were the most frequently used drugs, followed by analgesics, tocolytic agents and drugs for chronic conditions and common pregnancy symptoms [33].

The present study also had shown that inappropriate drug like Cimetidine, for patient with dyspepsia was given during pregnancy. High dose of these drugs should not be prescribed without determining the sex of the fetus because; this may lead to gynecomastia in male. However, their use may be acceptable if the benefit outweighs the associated risk. Hence, either safe alternatives should be used or close monitoring of the patient is required [4]. Gentamicin which prescribed during pregnancy was other drug of risk, there is evidence of selective uptake of amino glycosides by the fetal kidney resulting in damage (probably reversible) to immature nephrons. Eighth cranial nerve damage has also been reported following in utero exposure to some of the amino glycosides. Because of their chemical similarity, all amino glycosides must be considered potentially nephro toxic and ototoxic to the fetus [34].

Other was prescription of ant malarial drugs like, chloroquine that when used in high dose and for prolonged periods, may cause neurological disturbances and interfere with hearing, balance and vision in the fetus. Quinine in toxic doses, causes fetal damage including deafness, its ability to induce uterine contraction also constitutes a risk of abortion. Sulfadoxime+Pyrimethamine may interfere with folic acid metabolism and if it is given during pregnancy folic acid supplementation should be given. Sulfonamides may cause jaundice and haemolytic in new born [34, 35].

According to result of this study the use of mebendazole especially during first trimester of pregnancy was other drug of risk. There are no adequate and well-controlled studies in pregnant women, but animal studies have revealed evidences of embroyotoxic and teratogenic activity at single oral doses as low as 10mg/kg (approximately equal to human dose, based on mg/m^2). Mebendazole is contraindicated by the manufacturer thought pregnancy [36]. Although little published information available on the use of mebendazole in pregnancy, it should not be used in first trimester of pregnancy [37].

Therefore prescription such risk drug should not be underestimated. Hence, safe alternatives should be search or risk benefit ratio should be considered before prescription of those drugs during pregnancy.

Out of 428 drugs prescribed, 62.85% were FDA drug risk category A which is the safest category described by FDA followed by 20.56% Category B, 11.68% Category C, 3.27% category D and 1.64% to category X.

Table: 7 FDA drug risk category wise prescription pattern, Bishoftu, may, 2014 (N=262)

FDA category	First Trimester	Second Trimester	Third trimester	Total	Representative Drugs
A	87	138	44	269(62.85%)	Iron/folic acid, Vit B-complex
B	26	41	21	88(20.56%)	Amoxicillin, plasil
C	19	13	18	50(11.68%)	Iv fluids, Tramadol
D	5	2	7	14(3.27)	Phenobarbital, Diazepam
X	0	0	7	7(1.64)	Oxytocin, misoprostol
Total	137	194	97	428(100)	

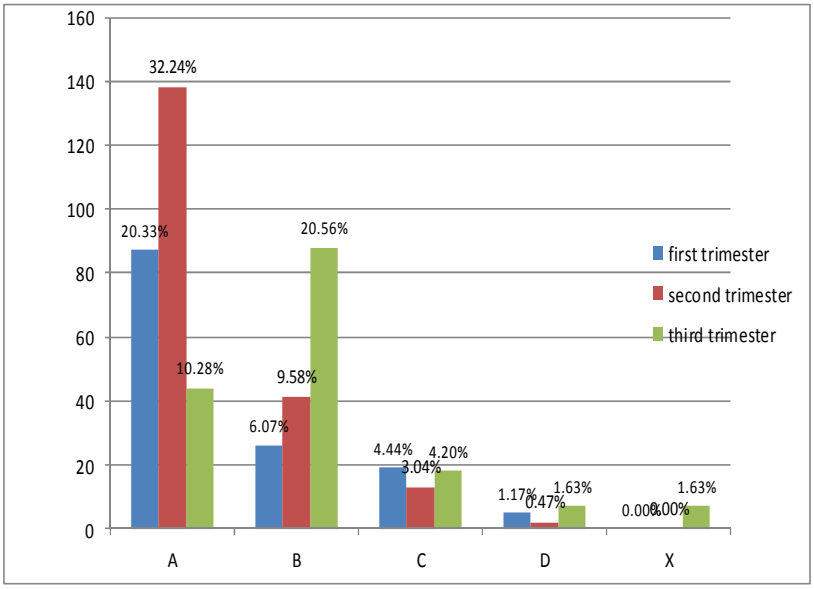

Figure: 2 FDA risk category of drugs prescribed in each trimesters of pregnancy in Bishoftu General Hospital, Bishoftu, may, 2014 (N=262)

Drugs play an important role in improving human health and promoting well-being. However, to produce the desired effect, they have to be safe, efficacious and have to be used rationally [24].

In this study the majority of the drugs used during pregnancy were from category A(62.85%), followed by category B(20.56%), category C(11.68%) and category D(3.27%), which was similar with result from Jizan[22] where majority of drugs used were from Category A (70.12%) followed by Category B (15.31%), Category C (13.24%) and Category D (1.33%).

Report from Addis Ababa [26] showed that majority of drug used during pregnancy were from category A (65.20%) followed by category B (27.20%), category C(17.70%); 3.60% and 0.20% of drugs were prescribed from category D and X respectively, which were comparable with our study.

In a study from Bratislava and Nitra [38], it was reported that a vast majority of prescribed drugs during pregnancy, belonged to category-C unlike this study in which majority of the drugs were prescribed from category A.

A total of 137,194 and 97 drugs, with an average of 0.52, 0.74, 0.37 were used per pregnant women during first, second and third trimester respectively, which was lower than study in Nanded [23] where A total of 972, 864 and 399 drugs, with an Average of 6.61, 3.66, 3.41

drugs per pregnant woman were used during first, second and third trimester of Pregnancy respectively; also lower than result from Adama[1] where a total of 176, 336 and 208 drugs with an average 2.2, 1.13 and 1.83 per pregnant women were used in first, second and third trimesters respectively.

Seven (1.64%) drugs used during pregnancy were from category X, which were different from result from India; where no category X drug prescribed to pregnant women.

In a retrospective, register-based cohort study in Finland [39], it was found that 20.40% of women purchased at least one drug classified as potentially harmful during pregnancy and 3.40% purchased at least one drug classified as clearly harmful; and also According to the HIMAGE study from France [40], 4.60% of women were exposed to drugs (mainly NSAIDs), involved in risk during pregnancy. Like in two above study, the result from present study showed that 3.27% and 1.64% were prescribed from D and X category which have potential fetal harm.

A total of 7 Category X labor-inducing drugs (misoprostol and oxytocin) were prescribed. Moreover, category D drugs like Diclofenac and ibuprofen (if given for third trimester mother), diazepam, Phenobarbital, sodium valporate, Doxycycline and tetracycline were also prescribed. This figure was comparable with study carried out in both Adama [1] (where 5.13% category D and 0.00% category X drugs prescribed) and Addis Ababa [26] (where 3.60% category D and 0.20% category X prescribed).

Among total drugs prescribed fourteen were category D, which are considered to be risky both to pregnant women and fetus, namely Doxycycline, tetracycline, diazepam, Diclofenac, ibuprofen, Phenobarbital, diazepam, sodium valporate; and seven were category X, namely misoprostol and oxytocin.

Table: 9 Lists of category D and category X drugs prescribed and their indication

Drugs	Trimester	Indication	FDA category
Doxycycline	2nd	UTI	D
Tetracycline	1st	UTI	D
NSAIDs	3rd	Pain in labor	D
Phenobarbital	1st	Epilepsy	D
Sodium valporate	1st	Epilepsy	D
Diazepam	3rd	Eclampsia/preeclampsia	D
Misoprostol	3rd	Labor	X
Oxytocin	3rd	Labor	X

Doxycycline and tetracycline were prescribed for urinary tract infections in first and second trimester of pregnancy. Use of these both drugs was contraindicated as both drugs can cross the placenta and their use late in pregnancy causes permanent discoloration of teeth, enamel hyperplasia and impaired fetal skeletal growth[5]. So, use of alternatives drugs was appropriate.

Diazepam was used for the treatment of mild to severe pre eclampsia. If diazepam is used for long period during pregnancy or at high doses, it might be associated with a high incidence of physiological depression when maternal doses exceed 30 mg, the babies being likely to have a tendency to apnea, reluctance to feed and impaired hermogenesis [4].

According to present results, Diclofenac and ibuprofen were used in third trimester for pregnant women in labor; however, this can cause early closure and constriction of ductusarteriosus with subsequent neonatal pulmonary hypertension and transient right-sided hypertrophic cardiomyopathy [12]. Therefore, it is very important to search for other alternatives that could alleviate pain during labor.

The other was epileptic drugs like phenobarbitone that can give rise to hypotension, respiratory depression and hypothermia in the newborn infant. Barbiturates can cause a decrease in vitamin K-dependent clotting factors, leading to bleeding in the newborn. Continuous treatment during pregnancy and administration during labour should be avoided [35].

Other drug was Valproic Acid which may cause in Neural tube defects (eg, spina bifida) occur in exposed fetuses. External ear anomalies, congenital heart defects, hypospadias, craniofacial anomalies, low birth weight, and small head circumference have been also reported. Serum concentrations should be kept as low as possible during pregnancy and the mother should be given supplemental folic acid [34, 35]. Hence, health care providers should give satisfactory advice to epileptic women not to be pregnant until years of free of episode of attack.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Overall prescription pattern during pregnancy in this set-up is appropriate and rational to a large extent. Vitamins and minerals were the highest group prescribed followed by

antibacterial drugs and analgesics. But, number of drugs prescribed by generic name suggesting need for sincere efforts to improve situation. If generic drugs are prescribed the cost of the patients treatment may be reduced. A large proportion of women in this region have Anemia in pregnancy and this was responsible for admission in all the three trimesters. Detection of anemia at an early stage can avoid the risks associated with blood transfusion during pregnancy. Majority of the drugs prescribed as per FDA category A, the safest category during pregnancy. 3.27% and 1.64% of drugs were prescribed from category D and X respectively, which have potential fetal harm.

5.2 Recommendations

The drug prescribing pattern observed among the pregnant women in Bishoftu general hospital was good and almost all the teratogenic drugs prescribed to them were labor inducing and they all were prescribed at term and post term. However, there were some category D drugs (diclofenac and ibuprofen, if given in third trimester, tetracycline, Doxycycline, and others) prescribed inappropriately to some of the pregnant women. Such inappropriate prescription of drugs should not be underestimated because it definitely affects the life of both the mother and the fetus. Therefore, it is recommended that there should be intensive assessment of pregnant women including the FDA risk category, the gestational period, and the risk-benefit balance of a drug before its prescription, and Continuous education on medication during pregnancy to health care providers. In addition, pharmacists should interact with other members of the health care team to develop, implement and monitor a therapeutic plan so as to achieve optimal care for each pregnant woman. Also strengthening the drug information center in the hospital is the other best possible solutions for medication error during pregnancy.

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