

Drug prescribing pattern among pregnant mothers attending obstetrics and gynecology department in Hiwot Fana Specialized Teaching Hospital, Ethiopia

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ABSTRACT

Objective: To assess the pattern of prescribing and drug therapy problems among the pregnant mothers in Hiwot Fana specialized University hospital, Harar Ethiopia. **Methods and subjects:** Retrospective cross-sectional study was employed to assess drug prescribing pattern and teratogenicity risk among pregnant women who received any clinical services from MCH and obstetric clinic from 11 September 2012 to 31 April 2013. **Result:** From a total of 422 samples selected, medical records of 395 pregnant women's were included in the study; where about 27 of the patient card was not found during data collection. Among the 395 pregnant mothers, 301 (76.2%) were outpatient and 94(23.8%) were admitted. one hundred thirty eight (34.9%) are in age group of 21-25 and one hundred twenty five (31.6%) were third trimesters. Most frequently prescribed drug classes were antibiotics, vitamins and minerals, NSAIDS and analgesics, anti-hypertensive's, cardio vascular drugs and fluids. Category D and X drugs which were considered to be risky to both pregnant women and fetus were prescribed for 42 (13.08%) pregnant women. From the study participant, 169 (42.8%) had drug therapy problem. One hundred eleven (28.1%) had need of additional drug therapy while 52 (13.2%) had unnecessary drug therapy and 11(2.8%), 24 (6.1%) had high and low dosage respectively. **Conclusion:** Antibiotics were commonly prescribed along vitamins and minerals while there were (13.08%) category D and category X drugs prescribed inappropriately to some of the patients. Such inappropriate prescription of drugs should not be underestimated because it definitely affects the life of both the mother and the fetus.

INTRODUCTION

Pregnancy is a time of profound physiological change in women body. These unique changes challenge physicians managing disease states during pregnancy in the selection of medications best suited to treat their patients. Maternal drug use during pregnancy

may pose a teratogenic risk to the fetus. However, the recommendation to avoid all drugs during pregnancy is unrealistic and may be dangerous.^[1,2]

Pregnancy should not deter clinicians from providing their patients with appropriate management of their medical conditions. Drugs play an important role in protecting and restoring health. Hence, prescribing during pregnancy is unusual risk benefit situation.^[3,4]

A study conducted in Addis Ababa Ethiopia concluded that a considerable proportion of pregnant women were exposed to drugs, including those with potential harm to the fetus. Furthermore, pregnant women self-medicated themselves with modern medications

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or traditional herbs. Healthcare providers should thus weigh the therapeutic benefits of the drug to the mother against its potential risk to the developing fetus before prescribing. In addition, it is essential to routinely inquire about the woman's self-medication practice and provide the appropriate advice to the pregnant women.^[5]

The objective of this study is to assess drug prescribing pattern and drug therapy problems (DTPs) among pregnant mothers in obstetrics and gynecology department.

MATERIALS AND METHODS

Patients and design

A facility based cross-sectional study design was employed. The study was approved by Ethical Review Board of Haramaya University School of Pharmacy. From September 11, 2012 to April 31, 2013 one clinical pharmacist and three graduating class pharmacy students have collected the data from Gynecology and Obstetrics Department of Hiwot Fana Specialized University Hospital (HFSUH), which is 510 km from East of Addis Ababa. The sample size was determined based on single proportion formula of standard statistical procedure and a systematic random sampling was employed to select the samples. Data on sociodemographic variables, past medical and medication history, current diagnosis, laboratory values, vital signs, and current medication were recorded for each patient.

Data collection

A pretested data abstraction format which has demographic profiles of pregnant women, gravidity, parity, gestational age, current diagnosis, and medication was utilized to abstract relevant data. The data was collected by three junior and one senior clinical pharmacists from patient card. Need additional drug therapy, unnecessary drug therapy, and inappropriate dosage were identified by principal investigator after important information were collected from the chart. For each problem identification; the diagnosis settled by prescribers, vital signs, and abnormal laboratory data with respective drug therapy prescribed were cross-checked with recommendations given by the following resources: Current obstetrics and gynecology, Pharmacotherapy: A path physiologic approach, Applied therapeutics: The clinical use of drugs, Uptodate®2009, and Standard treatment guideline for general hospital, 2010. If the prescribed drugs were in agreement with one of the resources in terms of treatment choice, dosage

and dosage form, it would be counted as problem free. However, any difference from the recommendation given by the resource materials results in DTPs. To increase consistency in the identification process, each patient format was checked three times.

Operational definitions

Adverse effect: Unexpected harm arising from a justified action where the correct process was followed for the context.

Bleeding: Process of losing blood.

Category D: There is a positive evidence of human fetal risk, but the benefits from use in pregnant women may be acceptable despite the risk.

Category X: Studies in animals or human being have demonstrated fetal abnormality or there is evidence fetal risk based on human experience or both and the risk of the use of drugs in pregnant woman clearly outweighs any possible benefits. The drug is contraindicated in woman who are or may become pregnant.

Dosage: Includes the dose given, the frequency of administration and the duration of therapy.

Dosage too high: The drug dosage is too high to result in undesirable effects.

Dosage too low: The drug dosage is too low to produce the desired response.

Gravidity: Refers to total numbers of pregnancies.

Need additional drug therapy: A drug therapy is required to treat or prevent a medical condition or illness from developing.

Parity: A condition of having carried a pregnancy to a point viability (a term used to indicate the number of pregnancies as woman has had resulted in birth).

Pregnancy risk drug: Category D or Category X drug according to Food and Drug Administration (FDA) pregnancy risk classification.

Unnecessary drug therapy: Drug therapy when the patient does not have a clinical indication at the time of data collection.

Data analysis

The data collected were cleaned, coded, and entered to statistical package for social sciences (SPSS)

for Windows, version 16 software. The data was cleaned again after the entry by doing frequencies and observing inconsistencies. Descriptive statistical analysis and cross tabs were done. Chi-square and binary regressions with 95% confidence interval were done to find out statistical significance. *P* value less than 0.05 was used to declare association.

Data quality control

The principal investigator was communicating with the advisor and receiving feedback and correction daily. Completeness, accuracy, and clarity of the collected data were checked carefully. Any error, ambiguity, and incompleteness which were not observed at data abstraction format were addressed on the following day before starting next day activities.

Ethical consideration

An official formal letter will be obtained from College of Medical and Health Sciences, School of Pharmacy and delivered to HFSUH specifically to gynecology and obstetrics and Mother and Child Health (MCH) wards to get a full cooperation and permission. The confidentiality of the patient on the patient’s medical card will be secured by not using their names during data collection.

RESULTS

Sociodemographic characteristics

From a total of 422 samples, medical records of 395 pregnant women were included in the study; where about 27 of the patient card was not found during data collection. Among the 395 pregnant mothers, 301 (76.2%) were outpatient and 94 (23.8%) were admitted. One hundred and thirty-eight (34.9%) are in age group of 21-25 [Table 1].

Table 1: Sociodemographic characteristics of pregnant mothers who received clinical services in obstetrics and gynecology department, Hiwot Fana specialized university hospital, from September 11, 2012 to April 31, 2013

Variables	Frequency	Percent
Patient status		
Inpatient	94	23.8
Outpatient	301	76.2
Age of mothers		
15-20	123	31.1
21-25	138	34.9
26-30	97	24.6
31-35	28	7.1
36-40	9	2.3

Number and type of prescribed medication

Majority of the women (134, 33.9%) received prescription containing one drugs, while 74 (18.7%) women remained without any medication [Figure 1]. Vitamins and minerals were the most prescribed drugs followed by antibiotics according to the study [Figure 2].

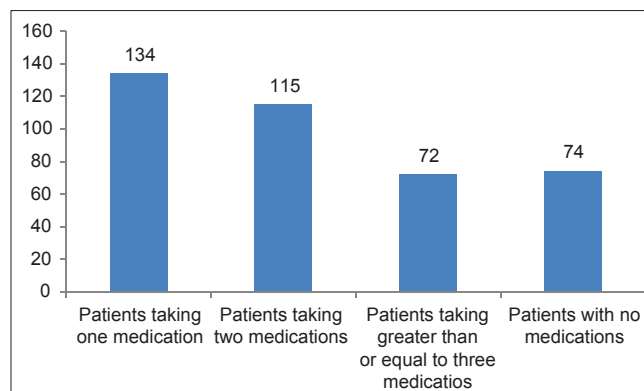


Figure 1: Number of medication prescribed for pregnant mothers receiving any clinical services, in Hiwot Fana Specialized University Hospital (HFSUH) from September 11, 2012 to April 31, 2013

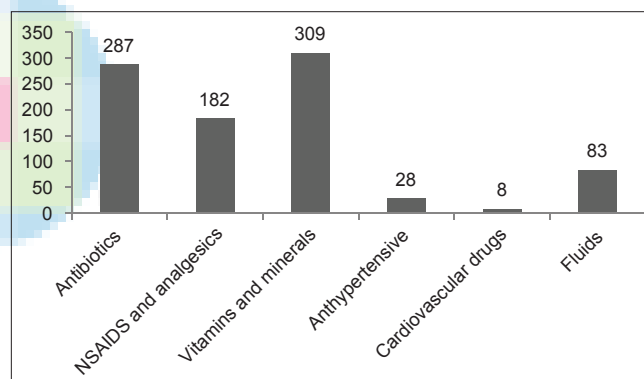


Figure 2: The most prescribed drug classes for pregnant mothers receiving clinical services in Obstetrics and Gynecology Department, in HFSUH, from September 11, 2012 to April 31, 2013

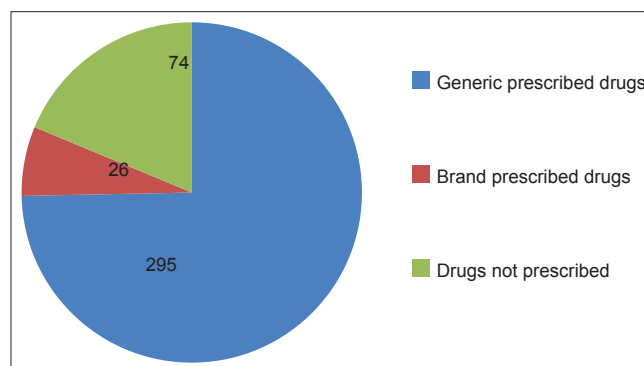


Figure 3: Types of prescription prescribed for pregnant mothers receiving clinical services in Obstetrics and Gynecology Department, in HFSUH from September 11, 2012 to April 31, 2013

Table 2: Drug therapy problems and types of DTPs identified among pregnant mothers in obstetrics and gynecology department in HFSUH, from September 11, 2012 to April 31, 2013

Variables	Frequency	Percent
Presence of DTP		
Yes	169	42.8
No	226	57.2
Types of DTP		
Need of additional DTP		
Yes	111	28.1
No	284	71.9
Unnecessary drug therapy		
Yes	52	13.2
No	343	86.8
Inappropriate dosage		
Low dosage	24	6.1
High dosage	11	2.8

DTP=Drug therapy problems, HFSUH=Hiwot Fana Specialized University Hospital

Types of prescription and pregnancy risk drugs

Among 321 pregnant mothers who prescribed at least one drug, 295 (91.9%) receives generic prescribed drugs while 26 (8.1%) receives brand prescribed drugs [Figure 2]. Category D and X drugs which were considered to be risky to both pregnant women and fetus were prescribed for 42 (13.08%) pregnant women [Figure 3].

Drug-related problems

Among pregnant mothers record involved in the study, 169 (42.8%) had DTP. One hundred eleven had need of additional drug therapy, while 52 (13.2%) had unnecessary drug therapy and 11 (2.8%) and 24 (6.1%) had high and low dosage, respectively [Table 2].

Associated factors for having DTPs

Pregnant mothers with two medical diagnosis were 3.211 times more likely to have DTPs than those

Table 3: Associated factors for having drug therapy problems identified among pregnant mothers in obstetrics and gynecology department in HFSUH, from September 11, 2012 to April 31, 2013

Variables	Presence of DTPs		COR (95% CI)	P value	AOR
	Yes	No			
Patient status					
Outpatient	114	187	2.313 (1.443-3.708)	<0.001*	0.663 (0.331-1.328) 0.247
Inpatient	55	39			
Pregnancy trimester					
Unknown	36	24	2.250 (1.200-4.218)	0.011*	2.444 (0.990-6.036) 0.053
First	47	48	1.469 (0.857-2.516)	0.162	0.834 (0.386-1.800) 0.644
Second	36	79	0.684 (0.401-1.164)	0.161	0.634 (0.311-1.293) 0.210
Third	50	75			
Gravid					
0	30	40			
1	59	63	1.249 (0.691-2.257)	0.462	1.144 (0.516-2.536) 0.740
2	37	61	0.809 (0.433-1.511)	0.506	0.863 (0.350-2.128) 0.749
3	24	26	1.231 (0.594-2.552)	0.577	2.035 (0.566-7.314) 0.276
4	9	22	0.545 (0.220-1.353)	0.191	2.612 (0.492-13.879) 0.260
≥5	10	14	0.952 (0.372-2.437)	0.919	5.955 (0.504-70.372) 0.157
Parity					
0	97	118			
1	35	45	0.946 (0.564-1.587)	0.834	0.980 (0.413-2.323) 0.963
2	23	28	0.999 (0.541-1.846)	0.998	0.675 (0.208-2.184) 0.511
3	6	18	0.405 (0.155-1.061)	0.066	0.249 (0.041-1.524) 0.133
4	3	10	0.365 (0.098-1.363)	0.134	0.179 (0.010-3.245) 0.245
≥5	5	7	0.869 (0.267-2.824)	0.815	0.220 (0.013-3.833) 0.299
Current medical diagnosis					
1	74	161			
2	73	59	2.692 (1.734-4.179)	<0.001*	3.211 (1.693-6.091) 0.00*
≥3	22	6	7.977 (3.105-20.499)	<0.001*	7.706 (2.359-25.175) 0.001*
Number of medication prescribed					
1	26	108			
2	49	66	3.084 (1.752-5.429)	<0.001*	2.042 (1.011-4.125) 0.047*
≥3	46	26	7.349 (3.860-13.992)	<0.001*	2.583 (1.029-6.486) 0.043*

*Clinical significant. CI=Confidence interval, COR=Crude odds ratio, AOR=Adjusted odds ratio, DTP=Drug therapy problems, HFSUH=Hiwot Fana Specialized University Hospital

with only one current medical diagnosis (adjusted odds ratio (AOR) 3.211 (1.693-6.091)), while pregnant mothers with greater than or equal to three current medical diagnosis were 7.706 times more likely to have DTPs than pregnant mothers with only one medical diagnosis (AOR 7.706 (2.359-25.175)) [Table 3].

DISCUSSION

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. The analysis presented exemplifies a well-considered drug use in pregnancy by the practitioners here in Hiwot Fana. During pregnancy, the indication for a drug treatment needs the utmost caution. For example, during the first trimester of pregnancy, the critical period during organogenesis, when the fetus is most susceptible to teratogenic effects of medications.

The current study showed that 76.2% of the pregnant women are outpatient treated on follow-up and the other 23.8% are admitted. Among the study participant, 81.3% receives a prescription containing at least one medication and 91.9% of the medication were generic prescribed which was greater than what was found in Nigeria (62%) and Brazil (72.8%) and lower than that of found in India (96%).^[6-8] The difference might be due to lower in number and variety of brands found in Ethiopia than in Brazil and Nigeria.

Drugs were prescribed in this study during all pregnancy trimesters. Accordingly, 24.1% were prescribed in first trimester and 29.1 and 31.6% were prescribed in second and third trimester, respectively; while, 15.2% were prescribed in unknown pregnancy trimesters which vary from that found in Mekelle, Ethiopia 8.30, 9.20, and 82.5% in first, second, and third trimester respectively.^[9]

World Health Organization developed a core prescribing indicators to measure the degree of polypharmacy practiced, the tendency to prescribe drugs by generic name and the overall level of use of antibiotics and injections. The degree to which the prescribing practice conformed to the essential drug list, formulary, or standard treatment guideline were also measured by searching for the number of drugs prescribed from essential drug list available. From this study, 22.5% obtains a prescription containing greater than or equal to three drugs and 41.7% take prescription with only one drug and the mean of drugs per prescription were 1.81, which was fit with the

World Health Organization (WHO) standard values of less than or equal to two drugs per prescription and less than thus found in Nigeria (3.4), India (2.27), and Saudi Arabia (2.08).^[10,7,11,8]

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. The benefits of rational drug use during pregnancy were not only restricted to the recovery of maternal health, but were also helpful in the development of the fetus. In this study, 13.08% FDA pregnancy risk category drugs were prescribed for pregnant mothers when compared to that of in Addis Ababa (4%), Mekelle (few), and India (no category X), show greater value and this was due to lack of essential pregnancy risk category drugs and information on drugs effect on different gestational ages that was easily accessible for health care practitioners from the hospital.^[5,7,9]

From the current study, vitamins and minerals were the most frequently prescribed drugs followed by antibiotics and cardiovascular drugs are the least prescribed drugs. They are given either alone or in combination with other drugs. From perspectives, this was relatively practiced in Addis Ababa where antianemic and vitamins were mostly prescribed followed by antibiotics and with that of antibiotics mostly prescribed in Saudi Arabia.^[5,12]

The presence of DTPs among pregnant women was associated with different reasons and risk factors. Identifying these factors were crucial for prevention and control of DTPs in an individual patient. From the study, 42.8% of pregnant women had DTP of which 28.1% (111) needs additional drug therapy, 13.2% had unnecessary drug therapy, 6.1% had low dose, and 2.8% had problem of high dose. Among the need of additional drug therapy, 62.2% drugs were required for prevention (for example need of folic acid for all first trimester pregnancy to prevent neural tube defect), 18% were needed for untreated medical conditions, and 19.8% were needed for synergistic effect in the treatment.

Unnecessary DTP which was found on 52 (13.2%) pregnant mothers include 23 (44.2%) drugs without indication and 29 (55.8%) indication of multiple drugs, while reasons for low dose includes (45.5%) drugs for short duration, (41.7%) drug dose too low, and (12.5%) drugs given in frequently. Problems with high dose found from the study were as a result of drugs given for long duration (45.5%), too

frequent administration (27.3%), and too high dose of drugs (27.3%).

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