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Research Article

Drug use and its associated factors among pregnant women in Bahir Dar city administration, northwest Ethiopia

Abstract

Background: The use of drugs during pregnancy calls for special attention because the health and life of unborn child has great value in addition to the mother. The drugs given to pregnant mothers for therapeutic purposes may cause serious structural and functional adverse effects in the developing child. The aim of this study was to assess drug use and its associated factors among pregnant women in Bahir Dar city administration.

Methods: Institutional based cross sectional study design was carried out. Data were entered into epi.info version 7 and analyzed using SPSS version 20. Crude and adjusted odds ratio were estimated to identify the associated factors using multivariable logistic regression.

Results: A total of 652 pregnant women were participated with 98.9 % response rate. The prevalence of drug use at least one drug during their pregnancy was 70.4% (excluding iron and multi vitamin). Multigravida (AOR:2.7, 95% CI (1.80-4.66)), chronic disease (AOR:2.97, 95% CI (1.27-7.27)), self-medication (AOR:3.24, 95% CI (1.85-5.68)), passive smoking exposure (AOR:2.20, 95% CI (1.64-4.43)) and caffeine beverage (AOR:0.43, 95% CI (0.27-0.70)) were significantly associated with drug use during pregnancy.

Conclusion: The prevalence of drugs prescribed including those with potential harm to the fetus during pregnancy is very high. Considerable proportion of pregnant women took self-medication by themselves with modern medications or traditional herbs. Therefore, efforts should be made to decrease exposure to harmful substances during pregnancy.

Abbreviations

ANC: Antenatal Care; AOR: Adjusted Odds Ratio; CI: Confidence Interval; ETB: Ethiopian Birr; FDA: Food and Drug Authority; PTU: Propylthiouracil

Introduction

The use of drugs during pregnancy calls for special attention because the health and life of unborn child has great value in addition to the mother. The drugs given to pregnant mothers for therapeutic purposes may cause serious structural and functional adverse effects in the developing child. It has been an issue of concern since the discovery of birth defects resulting from thalidomide use in early pregnancy during the 1960s in which the thalidomide disaster drastically changed the perception that the placenta served as a barrier to protect the fetus from the adverse effects of drugs [1-3].

On the other hand, exposure to smoke, coffee, and alcohol during pregnancy can contribute to prenatal complications and poor neonatal outcomes, consequences that have been well identified in epidemiological studies. Maternal smoking during pregnancy is an established risk factor for miscarriage, prenatal mortality, low birth weight, premature births, and small babies [4-8].

A high level of coffee consumption is associated with an increased risk of fetal death; it was related to various adverse pregnancy outcomes, including fetal loss, birth defects, and fetal growth retardation [9].

Drinking alcohol during pregnancy can cause miscarriage, premature birth, stillbirth, low birth weight, and a range of lifelong disorders, known as fetal alcohol spectrum disorders. The most known, fetal alcohol syndrome is one of the leading known preventable causes of mental retardation and birth defects [10,11].

It has been estimated that about 10% of congenital anomalies may be caused by environmental exposure like exposures to medications, alcohol, or other exogenous factors

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that have adverse effects on the developing embryo or fetus [12].

There are numerous gaps in knowledge about deleterious consequences for the fetus, prescription drug use by pregnant women should be viewed as a public health issue [13]. Pharmaco-epidemiological studies can measure the extent of prescription and teratogenic drug use in pregnant women. The studies conducted in developed countries where drug-prescribing practices are considered to be superior, have identified need for interventional measures aimed at rational prescription during the prenatal period [14,15].

This study was conducted to determine the level of drug use among antenatal care(ANC) attendant pregnant women in Bahir Dar and identify associated factors of drugs prescribed or administered on self-selection basis during pregnancy according to the United States-Food and drug authority (FDA) pregnancy risk classification of drugs [16].

A cross-sectional study of two national ambulatory care surveys done in USA showed that about half of all pregnant visits had one or more medications. Among the total visits, FDA Class A was the majority (private setting 65.7%; hospital outpatient clinics 79.5%) followed by Class C (private 26.5%; hospital 36.4%). Class D/X medications accounted for 6.4% and 2.9% of visits in private and hospital, respectively. Medications with unknown pregnancy categories were predominant in the private setting (12.0% and 3.9%) [3].

Studies from northern Europe showed that the lowest rates of prescription drug use during pregnancy ranging from 44.2% to 57%. Studies of pregnancies in the Netherlands (69.2%), Germany (85.2%), and France (93%) found the highest rates of exposure to prescription drugs, excluding vitamins and minerals [17].

A pilot study from Lebanese mothers showed that most of the women in study were taking supplements as iron (76.90%), folic acid (66.90%), multiple vitamins (66%), and calcium (48.9%). A total of 74% women reported drinking caffeinated beverages during pregnancy, whereas only 1.1% of them drank alcohol. However, 47.5% declared being exposed to smoking: 32% were exposed to passive smoking, 6.3% were active cigarette smokers, and 8.3% were water-pipe smokers. Among prescribed drugs, category B and C drugs were the most taken, with 72.9% and 34.9%, respectively, while category D represented 10.6% and there was a very low percentage for category X drugs (0.3%).

A study done in Pakistan showed that all the pregnant women attending the antenatal clinics received a prescription containing at least one drug. Majority of the women who received the prescriptions belonged to third trimester (55.4%) followed by second (33.6%) and first trimester (11.0%). Anti-anemic drugs including iron preparations and vitamin and mineral supplements (79.4%) were the most frequently prescribed drugs followed by analgesics (6.2%) and anti-bacterial (2.2%). 19.6% received prescriptions containing drugs other than vitamin or mineral supplements. Only 21.6% of all the prescribed drugs were outside this vitamin/mineral supplement class. Out of these 2.3% drugs were prescribed which are considered to be teratogenic. Misoprostol was the most frequently prescribed among the teratogenic drugs followed by carbimazole and methotrexate. In this study 0.8% of all the women were prescribed these teratogenic drugs [18] .

A study done in Addis Ababa showed that 71.3% pregnant women used at least one drug during their pregnancy (excluding vaccination). The pregnant women received a drug from category A, B, C, D and X (52.2%, 27.2%, 14.7%, 3.6%, and 0.2% respectively). Twelve percent (12.4% of the pregnant women self-medicated themselves with either over the counter or prescription drugs or traditional herbs. The majority of the drugs prescribed were iron and vitamins followed by anti-infective [19].

Methods

Study setting

The study was conducted in Bahir Dar city administration and institutional based cross sectional study design was carried out from March 20 – April 10, 2015. According to Bahir Dar city administration health department 2014 annual report, it has a total population of 297,749 and one referral governmental hospital, one private hospital, one privately owned clinic, one health center and one well-established ANC health institutions were selected using simple random sampling technique. Multi stage sampling method was used to select the required pregnant mothers.

The source population for this study was all pregnant women in Bahir Dar city administration during study period.

Study population was all pregnant women who came for ANC services to the health institutions in Bahir Dar city administration during study period.

Inclusion and exclusion criteria

Inclusion criteria: Pregnant women at any gestational age who were following ANC service at the selected health institutions.

Exclusion criteria: Pregnant mothers who came more than once during the study period was excluded

Vaccination of pregnant women were not considered as drug users.

Data collection procedure and data quality control

Data from a single participant were obtained using semi structured questionnaire and antenatal follow up cards of pregnant women were reviewed using check list which complement each other.

The check list was used to collect data about number of antenatal visits, gestational age and drugs prescribed during each trimester. While the semi-structured questioner was used to collect socio-demographic data, obstetric and medical history and self-medication practice of the pregnant women.

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Data collection instrument

Check list and semi - structured questionnaire were used to review the ANC follow up cards and interview pregnant women respectively so as to address all the dependent and independent variables under study.

Data collection

Five data collectors and one supervisor were recruited and trained for two days on how to use the data collection instruments and how to present the questions to the respondent in a simple and understandable way.

During the training data collectors were introduced to the objectives of the study. After completion of the training they were assigned for pretest before they start the actual data collection process. The data collection instruments were pretested before the actual data collection process to make sure that the questions were clear and could be understood by the respondents.

Data quality control

The data collection instruments were carefully prepared, pretested and modified based on the pretest results. Before the data collection, the questionnaire were translated to Amharic and then back translated to English by other person to keep its consistency and Amharic version was used.

To insure the quality of the data, meeting was held between the principal investigator, supervisor and data collectors to troubleshoot any problems that arose.

In addition, inspection for completeness and quality of data collection was carried out daily by the supervisor and detailed feedback was provided to data collectors and the collected data were checked by the principal investigator.

Data management and analysis

The data were entered in to Epi info version 7, cleaned, recoded and analyzed using SPSS version 20. Bivariate analysis was performed before multivariable analysis. In order to include in to the multivariable analysis, the independent variables p-value should be less than 0.2 in bivariate analysis. P-value of less than 0.05 cut points and 95% confidence interval was taken to predict determinant factors for drug use.

Ethical considerations

Ethical clearance was obtained from Institutional Review Board at University of Gondar. Official letter was given to ARHB research center and Bahir Dar city administration health department. Permission was obtained from each study area. Before enrolling any of the eligible study participants, the purpose and the benefits and the confidential nature of the study was described for each participant. Verbal informed consent was taken from each study participants and participants unwilling had the right to withdraw at any time without restrictions. the confidentiality of the data was insured.

Results

Socio demographic characteristics

A total of 652 pregnant women were participated and ANC cards of these participants were reviewed in this study with 98.9% response rate. The majority of the respondents 558(85.6%) were in the age group of 20 - 34, 55(8.4%) of them were 19 and below while 39(6%) were in the age group of 35-46.

Five hundred ninety-two (90.8%) respondents were married and 60(9.2%) were single.

Regarding their educational status, 76(11.7%) were unable to read and write, while 20(3.1%) of them able to read and write only. One hundred twenty (18.4%) completed primary education, 192(29.4%) had completed secondary school, while 244(37.4%) had higher level education.

Among the respondents 122(18.7%) were government employees, 144(22.1%) nongovernmental employees 57(8.7%) were merchants, 21(3.2%) were students, 281(43.1%) were house wife's and 27(4.1%) were unemployed.

One hundred sixty-eight (25.8%) of them earned below 780 Ethiopian birr (ETB) per month, 166(25.4%) earned between 781 and 1100 ETB, 163 (25%) earned between 1101 and 2000 while 155(23.8%) earned more than 2000 ETB per month (Table 1).

Drugs used during pregnancy

The prevalence of drug use at least one drug during their pregnancy was 90.3% (including iron and multi vitamins) and 70.4 % (excluding iron and multi vitamin).

The number of women for whom drugs were prescribed increased from 343(23.5%) in the first trimester to 564(38.6%) and 553 (37.9%) in the second and third trimesters, respectively.

A total of 1460 drugs were prescribed to the pregnant women. Anti-anemic preparations were the most frequently prescribed class of drugs (49.25%) during all the trimesters followed by analgesics (12.6%), antibacterial (8.84%), and anthelminthic (8.63%) (Table 2).

Others include: antidiarrheal, antiepileptic, anti-asthmatics, anti-diabetics and drugs for hyperthyroidism

Seven hundred nineteen (49.2%), 490(33.6%), 187(12.8 %), and 64(4.4%), of the drugs were prescribed to pregnant women drugs from US FDA category A, B, C, and D respectively (Figure 1).

A total of 517(79.3 %) women reported drinking caffeinated beverages during pregnancy. However, no one declared being exposed to active smoking.

Among 652 pregnant women who participated in the study 242(37.1%) took drugs on self-medication to treat their illness during their pregnancy, of whom 86 (35.5%) took modern medication while 16(6.6%) of the pregnant women took

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traditional preparations and 140(57.9%) of them took both modern and traditional medication.

The main source of drug for self-medication was 156(48.75%) from pharmacy/drug shop and 21(6.6%) was the least source from traditional healer (Table 3).

Factors associated with drugs use during pregnancy

On bivariate analysis the factors found to be significantly associated with drug use during pregnancy were: age, marital status, multi-gravida, chronic disease, total ANC visit, self-medication, passive smoking exposure and caffeine beverage.

From variables found to be significant in bivariate analysis; multiple Logistic regression analysis showed that multi-gravida, chronic disease, self-medication, passive smoking exposure and caffeine beverage were significantly associated with drug use during pregnancy (P-value< 0.05) (Table 4).

Discussion

The finding of this study revealed that a total of 589(90.3%) pregnant women were using at least one drug (including iron and multi-vitamins) during their current pregnancy. Excluding iron and multi-vitamins 459(70.4%) of the pregnant women

Table 1: Socio-demographic characteristics of pregnant women in Bahir Dar city administration, northwest Ethiopia, 2015(n=652).

Variables	Number of women	Percent
Age		
≤ 19	55	8.4
20-34	558	85.6
35 – 46	39	6.0
Marital status		
Married	592	90.8
Single	60	9.2
Educational status		
Unable to read and write	76	11.7
Able to read and write	20	3.1
Primary education	120	18.4
Secondary education	192	29.4
Higher level	244	37.4
Occupation		
Government employed	122	18.7
NGO employed	144	22.1
Merchant	57	8.7
Student	21	3.2
House wife	281	43.1
Unemployed	27	4.1
Monthly income		
≤ 780	168	25.8
781 – 1100	166	25.4
1101-2000	163	25.0
>2000	155	23.8

Table 2: Commonly prescribed class of drugs according to gestational age in Bahir Dar city administration, northwest Ethiopia, 2015.

Therapeutic classes	Trimester First	Second	Third	All trimesters	%
Anti-anemic preparations	236	256	227	719	49.25%
Antibacterial drugs	25	46	58	129	8.84%
Analgesics	22	79	83	184	12.60%
Antacids and ulcer healing drugs	9	36	20	65	4.45%
Antiemetic	5	34	58	97	6.64%
Antihistamine	4	7	0	11	0.75%
Anthelmintic	8	71	47	126	8.63%
Anti-inflammatory, ant rheumatics	8	21	36	65	4.45%
Anti-malarial	10	4	8	22	1.51%
Antiprotozoal	10	6	10	26	1.78%
Others	6	4	6	16	1.10%
Total	343	564	553	1460	100.00%

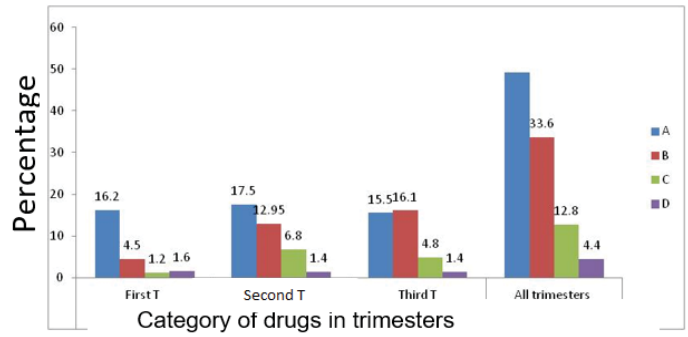

Figure 1: Drugs prescribed during pregnancy according to US-FDA risk category and gestational age (n=1460, No. of drugs).

Table 3: Self-medication practice during pregnancy among pregnant women in Bahir Dar city administration, northwest Ethiopia, 2015(n=652).

Variable	Number	Percent
Took at least one drug by self		
Yes	242	37.1%
No	410	62.9%
Drugs used for self-medication		
Modern	86	35.5%
Traditional	16	6.6%
Both	140	57.9%
Reason for self-medication		
Less costly	29	12%
Minor illness	78	32.2%
Long waiting time	44	18.2%
Used the drug before	`91	37.6%
Source of drugs		
Pharmacy/drug store	156	48.75%
Left over medicines	36	11.25%
Friends/relatives	18	5.6 %
Self-prescribed/prepared	89	27.8%
Traditional healer	21	6.6 %

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Table 4: Factors associated with drugs use during pregnancy among pregnant women in Bahir Dar city administration, northwest Ethiopia, 2015.

Variable	Drug Use Yes	No	COR (95% CI)	AOR (95% CI)
Age of women				
15-19	37	18	1	1
20-34	389	169	1.12 (0.62 – 2.02)	1.36 (0.36-5.09)
35-42	33	6	2.68 (0.95 -7.54)	4.70 (0.67-5.78)
Marital Status				
Married	408	184	2.53 (1.60-3.9)	1.5(0.68-2.40)
Single	28	32	1	1
Gravida				
Primigravida	96	158	1	1
Multigravida	275	123	3.68 (1.84 – 6.1)	2.75 (1.80-4.66)*
Chronic disease				
Yes	161	16	5.98(3.46-10.32)	2.97 (1.27-7.27)*
No	298	177	1	1
Total ANC visit				
1-2	213	233	1	1
3-4	146	60	2.66 (1.24-3.80)	1.03 (0.72-1.49)
Self-Medication				
Yes	182	60	1.46 (1.02-2.08)	3.24 (1.85-5.68)*
No	277	133	1	1
Passive smoking exposure				
Yes	64	24	1.34 (1.01-2.86)	2.20 (1.64-4.43)*
No	375	189	1	1
Caffeine Beverage				
Yes	352	165	0.56 (0.35-0.88)	0.43 (0.27-0.70)*
No	107	28	1	1

*independent variables that are statistically significant.

were using at least one drug during current pregnancy. when compared to the study done in Addis Ababa on 1268 pregnant women which had revealed that 71.3% of the respondents took at least one drug during their pregnancy [19]; this study showed a higher prevalence. This relatively higher extent of drug use may be due to the iron/fefol supplementation policy and focused antenatal care. While the finding was lower than other study done in Bahir Dar [20].

The number of women for whom drugs were prescribed increased from 343 (23.5%) in the first trimester to 564(38.6%) and 553 (37.9%) in the second and third trimesters, respectively. This study is comparable with a study done in India showed that 7.40% (30), 24.69% (100) and 67.90%(275) women were used drugs in the first, second and third trimester of pregnancy.

Commonly prescribed drugs to the pregnant women during their pregnancy were anti-anemic followed by analgesic drugs, anti-bacterial, Anthelmintic, Antiemetic, anti-malaria and antacids. This is comparable with the result shown in a study done in Addis Ababa and Pakistan [18,19].

As shown in Table 3, 719(49.2%) of the pregnant women received a drug from category A; 490(33.6%) from category B; 187 (12.81%) from category C; 64(4.4%) from category D of the US-FDA risk classification system. Frequently prescribed category A drugs were iron and vitamins; while the category B drugs prescribed were amoxicillin, cephalexin, paracetamol, metoclopramide, and insulin; the category C drugs prescribed were aluminum hydroxide/antacids/chlorpromazine, promethazine, and mebendazole; the category D drugs used were doxycycline, Cotrimoxazole, acetyl salicylic acid, phenobarbitone, and propylthiouracil (PTU).This result is consistent with a study done in Addis Ababa indicated that nearly 4% of the pregnant women were prescribed from category D or X of the US FDA risk classification. In another study conducted to evaluate the patterns of drug prescriptions to pregnant women in tertiary care hospitals in Pakistan out of 1275 drugs prescribed to the pregnant women 2.3% of drugs prescribed were considered to be teratogenic. Twenty nine pregnant women (0.8% of all the women studied) were prescribed these teratogenic drugs [18].

However, when compared with a study done in Nigeria, 13% of pregnant mothers were prescribed from category D; the proportion of women receiving drugs with potential for fetal harm was not high.

This study revealed 37.1% prevalence of self-medication practice, among these pregnant women 86(35.5%)modern drugs, 16(6.6%) herbal preparation and 140(57.9%) both modern and traditional herbal preparation for self-medication. It is higher than a similar study done in Addis Ababa [19], where the prevalence of self-medication was found to be 12.4% with 4.1% of them used herbal preparations. This high self-medication practice generally and specifically the prevalence of herbal use may be because the study is done in area where the health facilities are not adequate and accessible to the pregnant women compared to that of Addis Ababa which is the capital city of the nation with relatively adequate and accessible health facilities. Hence, traditional medicine may be the only available source of health care within a reasonable distance. However, these findings were comparable to a study done in Nigeria revealed that out of the 1200 pregnant women studied; self-medication practice was 26.8 % [21].

The herbal preparations reported to be used by the pregnant women for self-medication in our study include *Zingeber officinale* (ginger), *Allium sativum* (garlic or nechi shinkurit), *Zehneria scabra* (aregresa) which were also reported to be used for self-medication in Addis Ababa [19].

Seventy-nine percent (79.3%) of pregnant women reported drinking caffeinated beverages during pregnancy, Coffee consumption was associated with drug use (AOR=0.43, 95% CI (0.27-0.70); the odds of drug use among pregnant women not drinking coffee is higher than those drinking coffee. The occurrence of congenital malformations, fetal growth retardation, miscarriages (spontaneous abortions), behavioral effects, and maternal fertility problems that presumably resulted from caffeine consumption have all been reported. In a Danish study of 7346 pregnant women, found that consumption of coffee during pregnancy was associated with a higher risk of fetal death, while Coffee consumption during pregnancy has

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been subject to preventive action in some countries. Therefore, it was recommended to be restricted by several researchers [22].

Pregnant women with two and more gravida were 2.75 times more likely to use a drug than pregnant women with primigravida (AOR= 2.75, 95% CI: 1.80-4.66). Pregnant women with chronic disease were about 3 times more likely to use a drug than those who had no chronic disease (AOR= 2.97, 95% CI: 1.27-7.27). Pregnant women who practiced self-medication were 3.24 times more likely to use a drug than those not practicing self-medication. Being passive smoker pregnant women (AOR= 2.20, 95% CI: 1.64-4.43) were significantly associated with drug use in which they were 2.20 times more likely to use a drug during pregnancy than those nonsmoking exposure. When compared to a pilot study from Lebanese mothers showed that most of the women (74%) women were reported drinking caffeinated beverages during pregnancy and it was lined with this study; however, 32% were exposed to passive smoking and it was a higher proportion than this study. This difference of smoking practice might be due to cultural and geographical differences between Ethiopia and Lebanese [23].

Conclusion

The prescribed drug use including category C and D drugs with potential harm to the fetus during pregnancy was high in Bahir Dar city administration.

Furthermore, a considerable proportion of pregnant women self-medicated themselves with modern medications or traditional herbs.

Drugs prescribed during pregnancy were significantly associated with gravida, chronic illness, self-medication, passive smoking exposure and coffee beverage.

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