



Assessment of Antibiotic use in Pregnant Women in a Tertiary care Teaching Hospital – A Cross Sectional Observational Study.

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ABSTRACT

During pregnancy, most women are at risk for respiratory tract infections (RTIs), urinary tract infections (UTIs), and ear, nose, and throat infections. Antimicrobials are the most commonly given medications to treat acquired illnesses during this time. This study aimed to assess antibiotic use in pregnant women in a tertiary care teaching hospital. The present study was a cross-sectional prospective observational study and was conducted for three months in a tertiary care health centre in North Karnataka with 57 participants. All case records of pregnant women who use antibiotics admitted to Obstetrics and Gynecology department and pregnant women with more than 18 years of age were included in the study. Out of 57 participants, 40.3% of them were belonging to the age category of 19-23 years of age, followed by 33.3% in 24-28 years. Most prevalent infections which required antimicrobials prescription were UTIs (36.82%), followed by Gastroenteritis (17.54%) and Pyrexia (14.03%). Majority of the antimicrobials prescribed were from Betalactams (40.34%), followed by Nitrofuranes (29.82%). To assist in making prescribing decisions for pregnant women, health care professionals should examine the teratogenic and toxic risk profiles of antibiotics. These could be especially significant if anti-infective countermeasures are needed to safeguard the health, safety, and survival of people who have been exposed to pathogenic bacteriologic agents as a result of bioterrorism.

Keywords: Antimicrobials, pregnancy, teratogenic effect, urinary tract infections

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Received 21 July 2021, Accepted 14 August 2021

Please cite this article as: Prince A *et al.*, Assessment of Antibiotic use in Pregnant Women in a Tertiary care Teaching Hospital – A Cross Sectional Observational Study. American Journal of Pharmacy & Health Research 2021.

INTRODUCTION

Pregnancy is a unique state in which a woman's body undergoes significant physiological changes, necessitating extra caution in medicine prescription.^[1] During pregnancy, most women are at risk for respiratory tract infections (RTIs), urinary tract infections (UTIs), and ear, nose, and throat infections. Antimicrobials are the most commonly given medications to treat acquired illnesses during this time.^[2] Pregnant women's prescribing habits are serious events that can result in a teratogenic risk to the fetus. Because of these specific changes, clinicians treating illness conditions during pregnancy face a problem in determining which drugs are most suited to treat their patients.

A big randomized controlled trial published recently found that preterm babies born to women who were given antibiotics had a higher risk of cerebral palsy than preterm babies born to women who were given a placebo. Other research has linked prenatal antibiotics to an increase in the rate of early onset Gram-negative bacteremia in neonates with low birth weight, as well as an increase in the prevalence of resistant organisms in the mother gut flora.^[3]

Historical events such as the thalidomide crisis in the 1960s and the teratogenic effects linked to the use of diethylstilbestrol in 1971 have affected the concern regarding pharmaceutical usage during pregnancy and breastfeeding. Following these incidents, the US Food and Drug Administration enacted tight laws governing treatment labeling and the use of drugs during pregnancy, demanding demonstrations of a drug's safety and efficacy before it can be sold commercially.

As a result, the US FDA classified medications used during pregnancy in 1979 based on their teratogenic effect, taking into account the quality of data from animal and human research. Although group A is thought to be the safest, medications from categories B, C, and D are also utilized during pregnancy. The only classification that indicates a medicine is absolutely inappropriate for usage during pregnancy is Category X.^[4]

By constructing a profile of drug intake, reviewing available health services, and studying interventional approaches, pharmaco epidemiological studies can help to reduce the inherent risk of drug use in pregnancy.^[5] As a result of the lack of data on antibiotic prescribing patterns in pregnancy, pharmacoepidemiologic research are needed to encourage adequate and safe antibiotic use during pregnancy.

As a result, this study will be conducted with the good goal of obstetricians to reduce maternal and fetal/neonatal infectious problems, which are negatively affecting the microbial milieu for the future generation. In this context, the Department of Pharmacy Practice has suggested a study

titled Assessment of Antibiotic Prescribing Patterns in Pregnancy, with the goal of assessing antibiotic prescribing patterns in pregnant women in order to ensure safe and proper use of the drugs.

MATERIALS AND METHOD

The present study was a cross-sectional prospective observational study and was conducted for three months in a tertiary care health centre in North Karnataka with 57 participants. All case records of pregnant women who use antibiotics admitted to Obstetrics and Gynecology department and pregnant women with more than 18 years of age were included in the study. Case records of pregnant and non-pregnant women of out-patient department, non-pregnant women admitted in Obstetrics and Gynecology department and pregnant women diagnosed with acute and chronic medical conditions requiring hospitalization were excluded from the study. The ethical approval to conduct the study was obtained from the Institutional Ethical Committee of the study hospital. The patient information, medications and laboratory investigations were collected by a well-designed data collection form from hospital case sheets. Microsoft Excel and Word were used to generate graphs and tables.

RESULTS AND DISCUSSION

The present study included 57 married women of reproductive age group. Out of 57 participants, 40.3% of them were belonging to the age category of 19-23 years of age, followed by 33.3% in 24-28 years. More than 50% of women have at least one child. About 66.6% of pregnant women belong to nuclear family. 43.85% of participants had completed primary education and 82.45% of women were housewives. The same data were shown in table 1.

Most prevalent infections which required antimicrobials prescription were UTIs (36.82%), followed by Gastroenteritis (17.54%), Pyrexia (14.03%), Candidiasis (8.77%), RTIs (7.01%), Cervical circlage (5.26%) and others (10.52%) (Table 2).

Majority of the antimicrobials prescribed were from Betalactams (40.34%), followed by Nitrofurans (29.82%), Nitroimidazoles (17.54%), Antifungals (8.77%) and Others (3%) (Figure 1).

Table 1: Demographics and Social Data (n=57)

Variables	Total number of participants	Percentage (%)
1. Age distribution (in years)		
19- 23	23	40.35
24- 28	19	33.33
29-33	13	22.80
≥34	2	3.50
2. Gravida		

Gravida 1	32	56.14
Gravida 2 and above	25	43.85
3. Type of family		
Nuclear family	38	66.66
Joint family	19	33.33
4. Level of education		
Primary	25	43.85
Secondary	18	31.57
Higher secondary	12	21.03
Graduates and above	2	3.50
5. Occupation		
Housewife	47	82.45
Government	2	3.50
Coolie/Skilled	5	8.77
Professional	3	5.26

Table 2: Frequency of different conditions during pregnancy (n=57)

Diseases	Number of participants	Percentage (%)
UTI	21	36.82
Gastroenteritis	10	17.54
Pyrexia	08	14
RTI	04	7.01
Candidiasis	05	8.77
Cervical Cerclage	03	5.26
Others	06	10.52

Most commonly prescribed drugs were: Nitrofurantoin for UTIs, Cefotaxime for RTIs and pyrexia; and Metronidazole for Gastroenteritis.

Majority of the antimicrobials were administered orally (75.44%), followed by injections (24.56%) (Figure 2).

Antimicrobials were mostly prescribed from FDA Category B (96%), followed by 2% each from FDA Category C and D (Figure 3).

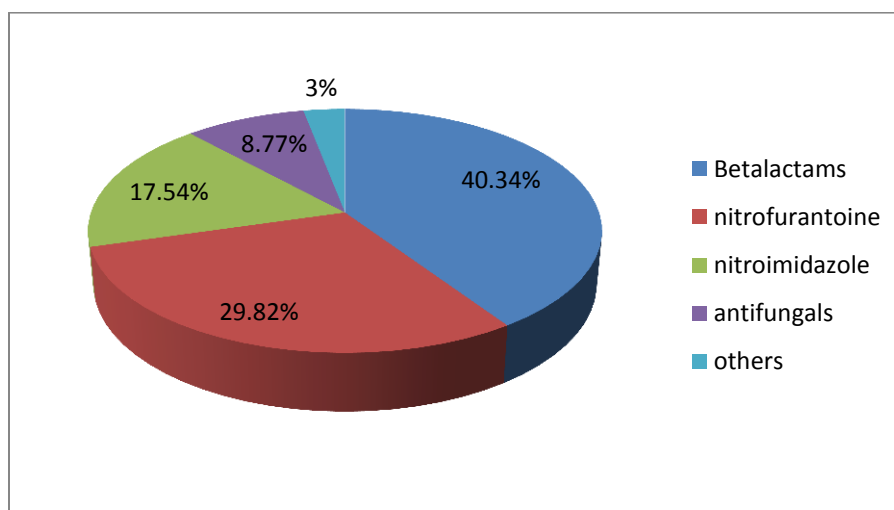


Figure 1: Percentage of antimicrobials prescribed (n=69)

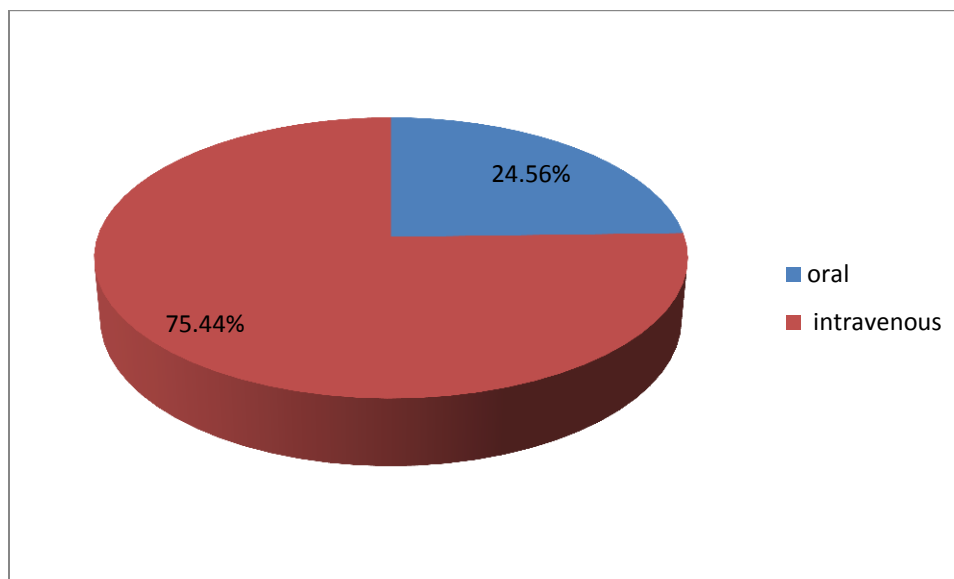


Figure 2: Route of administration (n= 69)

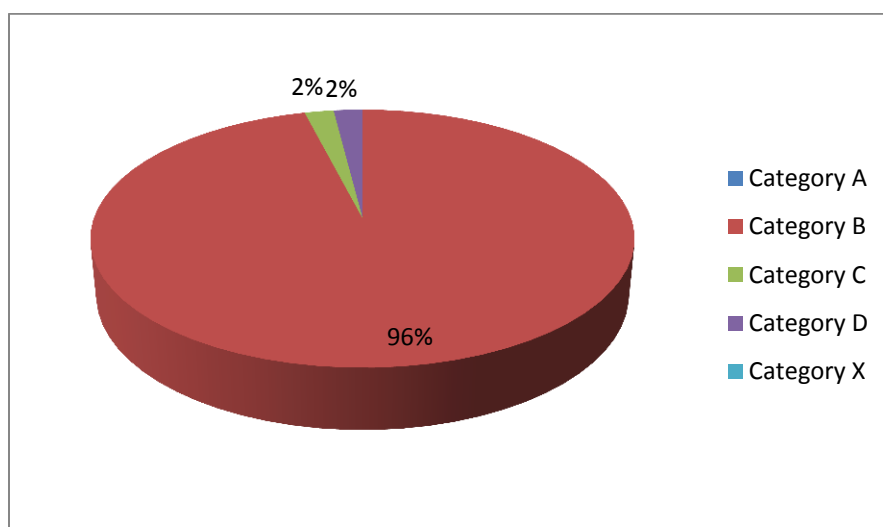


Figure 3: FDA category of antibiotics prescribed (n=69)

DISCUSSION

A prospective cross sectional observational study was carried out with 57 pregnant women with more than 18 years of age who use antibiotics, admitted to Obstetrics and Gynecology department.

Majority of women in our study had only one child. This result was contrary to a study performed by Mensah KB et al and Masinde A et al.^{11,12} In our study, the most prevalent infections during pregnancy were UTIs followed by gastroenteritis, which were the leading causes for antimicrobial treatment. Similar findings were reported in the studies done by Babu RH et al and Mensah KB et al.^{10, 12} It is a known fact that gravid uterus exerts pressure over urinary bladder resulting in retention of urine leading to UTIs.^{12, 13, 14}

Betalactams constituted two-fifths of the antimicrobials prescribed followed by Nitrofuranes and Nitroimidazoles similar to the study reports from South India and Africa.^{11,12} This similar results can also be seen in a study conducted by Eric M *et al*, where, out of 15 different antibacterial medications, beta-lactams were commonly prescribed.¹⁴ In this study, among betalactams, Cephalosporins were the most commonly used antimicrobials. This result was contrasted to a study conducted in South India, where, Penicillin were the most commonly prescribed antibiotic.¹¹

Antifungals prescription was observed in one-tenth of cases in this study, which is higher than that reported from a study in South India.¹¹

About one-third of pregnant women included in this study had antimicrobial exposure. Increased incidence of urinary tract infections and gastroenteritis leads to increased antimicrobial exposure during third trimester.^{12,16,17}

In three-fourths of the cases, antimicrobials were administered parenteral, the rest were administered orally in this study. Parenteral route is commonly preferred over oral route. This result was contrary to the study conducted by Eze UI *et al*.¹

Almost all the antimicrobials used were from FDA category B and therefore considered to be safe in pregnancy. Results of our study are in concordance with other studies done.^{2, 12} Overall, the antimicrobials usage in this study can be considered to be safe.

CONCLUSION

The most common reason for antibiotic prescriptions was urinary tract infections (UTIs). The majority of the antibiotics were given intravenously. Because they were from FDA Category B, the majority of antimicrobials prescribed were safe. To assist in making prescribing decisions for pregnant women, health care professionals should examine the teratogenic and toxic risk profiles of antibiotics. These could be especially significant if anti-infective countermeasures are needed to safeguard the health, safety, and survival of people who have been exposed to pathogenic bacteriologic agents as a result of bioterrorism.

ACKNOWLEDGEMENTS

The authors take it as a privilege to acknowledge Medical Superintendent, Navodaya Medical College Hospital and Research Centre (NMCH and RC), Raichur for the support in this study. The authors are grateful to the Heads of the Department of and Staffs of the Department of Pharmacy Practice, Department of OBG of NMCH and RC for their support during the study.

CONFLICTS OF INTEREST

The authors declared that they have no conflict of interests.

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