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Prescribing Trend of Antibiotics during Pregnancy in Urban Health Care Center in South India

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ABSTRACT

The main objective of present study is to measure the prescribing trends of anti-microbial drug use during pregnancy and list the doses, classes, types, and indications for anti-infective use during pregnancy. Retrospective analysis of prescriptions of pregnant women attending the urban health center was included and prescriptions containing antimicrobials were recorded for a period of one year from May 2012 to April 2013. Prevalence of anti-infective drug use during pregnancy was 14.5%. Penicillin was widely used compared to other classes. The most diagnosed infections were urinary tract infections. Our results suggest that antibiotics appear to be prescribed to pregnant women generally in accordance with guideline recommendations.

Keywords: Prescription, Antibiotics, Antenatal care, Primary care, Pharmacoepidemiology.

INTRODUCTION

Pharmacoepidemiological studies dealing with prescription of drugs in pregnancy are numerous (Das BP *et al.*, 2006; Culig J *et al.*, 2007; Egen-Lappe V *et al.*, 2004; Donati S *et al.*, 2000). Epidemiological studies of pregnancy outcome after specific drug exposures are often superficially reassuring, but most are severely limited in their power to detect adverse outcomes (Webster WS *et al.*, 2003). Maternal drug use during pregnancy may pose a teratogenic risk to the fetus. Exposure to any chemical during pregnancy could affect the fetus; this includes medications, supplements, herbal therapy, as well as, environmental components. On the other hand, the use of anti-infective drugs in pregnancy has been cited as one of the main causes of decrease in maternal and perinatal mortality in industrialized countries (Lockitch *et al.*, 2004). Many studies have been conducted worldwide to study the attitudes, knowledge, and the exposure to medication and supplement during pregnancy (Sharma R *et al.*, 2005, Nordeng H *et al.*, 2001, Henry A *et al.*, 2000, Lacroix I *et al.*, 2000, Splinter MY *et al.*, 1997, Buitendijk S *et al.*, 1991 and Rizk MA *et al.*, 1993). Other research focused mainly on the utilization of complementary and alternative medicine by pregnant

women (Nordeng H *et al.*, 2004, Pinn G *et al.*, 2002 and Gibson PS *et al.*, 2001). The increasing prevalence of antibiotic-resistant bacteria poses a major threat to the health of hospitalized patient (Cosgrove and SE *et al.*, 2002). The relationship between the emergence of resistance and antibiotic use and misuse was well recognized. It is evident that antibiotic affects not only the microorganism and the individual patient, but also the population as a whole. In this study, we describe trends in prescription of general and broad spectrum antibiotics during pregnancy in urban health care center in South India, over a period of one year.

Methodology

The study was conducted using the data from prescription of pregnant women attending antenatal clinic in urban health care center, Guntur during the study period May 2012 to April 2013. Antimicrobial agents were categorized using the 2008 Anatomical Therapeutic Chemical (ATC) classification index. Data were collected for oral systemic agents in the ATC subgroups J01 (anti-bacterial agents), J02 (anti-fungals), and J04 (anti-mycobacterials). The ATC classification and guidelines are updated regularly and the system is widely used internationally for drug utilization studies (WHO Collaborating Centre 2010). The prevalence of anti-infective drug use during the 12 months before pregnancy was calculated by dividing the

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number of women receiving at least one prescription for an anti-infective in this 12-month period by the total number of women that met eligibility criteria.

RESULTS AND DISCUSSION

The analysis included the data of 182 pregnant women. The average age of the participants was 25.1± 5.7 years, most of the participants were multipara (an average of 2.8± 2.4 previous pregnancies), have an average of two children, and 1.3% had previously given birth to premature baby. Most of the participants live in suburban, had elementary or school education, and had moderate incomes. At the time of the interviewing, 85% of women did not suffer from any infectious disease. Most often (65%) infection was community acquired and in 20% patients there was not to estimate origin of the infection. The most prevalent infections during pregnancy were urinary tract infections-59.9%, candidiasis-18.4%, and RTI-6.6% listed in Table 1. Table.2 lists the most prevalent anti-infective used stratified by ATC classes for each period. Penicillins use increased over time, whereas use of other anti-microbial classes such as macrolides, quinolones, antimycotics, and

sulfonamides decreased within the same period. In 28% cases were used topical (intravaginal) antimicrobial administration. Most often of topically administrated antimicrobials (19.02% of all prescriptions) were prescribed combined drugs included antibacterials and antimycotics. In 82.5% cases antimicrobials were prescribed systemically. Most often were prescribed betalactams (56.2%). More often were prescribed ampicillin (41.5%). Amoxicillin + clavulanic acid was prescribed in 8.4% pregnant women with UTI. Cephalosporins were prescribed in 4.9% UTI (mainly III- and Ist generations). Aminoglycosides (5.6%), other antimicrobials (fluoroquinolones, antiviral drugs, antifungals) were prescribed rarely. In our study, 60.0% of the anti-infective drugs used in the first trimester are considered safe – these drugs are not known to be associated with the risk of adverse pregnancy outcomes (Norwitz ER et al 2009). This number rises to 77.0% in the second, and to 86.0% in the third trimester of pregnancy. This is a good indication that physicians are concerned not to expose pregnant women too potentially harmful anti-infective drugs.

Table.1 Infections occurred during pregnancy

Infection	Occurrence %	ICD -Code
UTI	59.9	590
Candidiasis	18.4	110-118
Viral infections	11.2	045-066
Respiratory infections	7.6	460-466
GIT	1.2	001-009
Pelvic inflammatory disease	1.6	614-616
Parasitic infections	1.4	120-136

Table.2 Antimicrobials prescribed in pregnant women

Antimicrobials	(ATC/WHO J-anti-infectives for systemic use)	Out patients %	Inpatients %
Antimicrobials	(ATC/WHO J-anti-infectives for systemic use)	Out patients %	Inpatients %
Ampicillin	(ATC/WHO J01C)	41.6	31.5
Amoxicillin/clavulanate	(ATC/WHO J01C)	8.4	5.6
Cephalosporins I	(ATC/WHO J01D)	1.7	9.7
Cephalosporins II	(ATC/WHO J01D)	2.0	0.7
Cephalosporins III	(ATC/WHO J01D)	1.2	10
Aminolycosides	(ATC/WHO J01F)	5.6	3.8
Quinolones	(ATC/WHO J01M)	2.8	1.5
Co-trimoxazole	(ATC/WHO J01E)	2.1	0.3
Nitroimidazoles	(ATC/WHO J01X)	1.8	7.4
Antifungals	(ATC/WHO J02)	0.0	6.8

CONCLUSION

According to our investigation pregnant women were prescribed with antibacterial agents in the first trimester of pregnancy. They used 10 different antibacterial medications, most often beta lactam

antibiotics. The most frequently used antibacterial were drugs from category B according to harmful effects to the fetus. The use of anti-microbial drugs during pregnancy is prevalent and common.

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