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A Study on Anti-microbial Prescribing Pattern during Pregnancy in a Tertiary care Hospital 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 antenatal clinic was included and prescriptions containing antimicrobials were recorded for a period of one year from March 2009 to Feb 2010. Prevalence of anti-infective use during pregnancy was 24.5%. Penicillin use was increased compared to other classes. The most frequently diagnosed infections were urinary tract and sexually transmitted infections. We conclude that Anti-microbial use during pregnancy is prevalent. The oldest and safest agents are prescribed.

Key words: Prescription, Anti-microbial, Pregnancy, ATC classification index.

Introduction

A Primary goal of public health response to emerging infections is to limit illness and death by providing the safest and most effective medical prophylaxis and treatment measures in a timely manner to persons at greatest risk. Information on the effectiveness and safety of some treatment measures is limited for the general population, and even less information is available for pregnant women (White SR *et al.*, 2002). Maternal drug use during pregnancy may pose a teratogenic risk to the foetus. However, the recommendation to avoid all drugs during early pregnancy is unrealistic and may be dangerous (Vallance P, 1996 and Banhidly F *et al.*, 2005). Exposure to any chemical during pregnancy could affect the fetus; this includes medications, supplements, herbal therapy, as well as, environmental components. 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 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. This paper describes antibiotic utilization for treatment of pregnant women attending at tertiary care hospital in Kadapa.

Methodology

Data on the prescription of antibiotics were retrieved from medical records of pregnant women between March 2009 and March 2010, retrospectively at teaching hospital in Kadapa, who were attending as both outpatients and inpatients. Anti-infective drugs were categorized using the 2008 Anatomical Therapeutic Chemical (ATC) classification index. Data were collected for oral systemic

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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 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 218 pregnant women. The average age of the participants was 28.1 ± 5.7 years, most of the participants were multipara (an average of 3.8 ± 2.4 previous pregnancies), have an average of two children, and 2.3% had previously given birth to premature baby. Most of the participants live in villages, had elementary or school education, and had moderate incomes. At the time of the interview, 90% of women did not suffer from any chronic disease. Most often (77.5%) 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 –

39.9%, STD – 19.3, candidiasis – 17.4%, 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 80.98% cases antimicrobials were prescribed systemically. Most often were prescribed betalactams (16.2% for outpatients and 57.7% for inpatients). More often were prescribed ampicillin (4.6% for outpatients and 31.5% for inpatients). Amoxicillin + clavulanic acid was prescribed in 6.4% of outpatients and 5.6% inpatients pregnant women with UTI. Cephalosporins were prescribed in 5.2% and 20.6% for outpatient and inpatient UTI (mainly III- and I-st generations). Quite often were prescribed nitroimidazoles-1.8-7.4% (in general metronidazole), nitrofuranes - 8.2-15.0%, aminoglycosides- 4.6-3.8%. Other antimicrobials (fluoroquinolones, antiviral drugs, antifungals) were prescribed rarely.

Table.1 Infections occurred during pregnancy

Infection	Occurrence %	ICD -Code
UTI	39.9	590
STD	19.3	599
Candidiasis	17.4	110-118
Viral infections	11.2	045-066
Respiratory infections	6.6	460-466
GIT	0.2	001-009
Pelvic inflammatory disease	1.4	614-616
Parasitic infections	1.97	120-136

Table.2 Antimicrobials prescribed in pregnant women

Antimicrobials	(ATC/WHO J-anti-infectives for systemic use)	Out patients %	Inpatients %
Ampicillin	(ATC/WHO J01C)	4.6	31.5
Amoxicillin/clavulanate	(ATC/WHO J01C)	6.4	5.6
Cephalosporins I	(ATC/WHO J01D)	1.9	9.7
Cephalosporins II	(ATC/WHO J01D)	2.3	0.7
Cephalosporins III	(ATC/WHO J01D)	1.0	10
Aminoglycosides	(ATC/WHO J01F)	4.6	3.8
Quinolones	(ATC/WHO J01M)	6.8	1.5
Co-trimoxazole	(ATC/WHO J01E)	2.7	0.3
Nitroimidazoles	(ATC/WHO J01X)	1.8	7.4
Antifungals	(ATC/WHO J02)	0.0	6.8
Other		0.0	2.7

In our study, 66.0% 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 to not expose pregnant women to potentially

harmful anti-infective drugs.

Conclusion

The use of anti-microbial drugs during pregnancy is prevalent and common. Gynecologist should take into consideration in using the older drugs which are proven safer. But use of harmful antimicrobials may raise a question whether they are really required or not.

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