

# A prospective study on antimicrobial usage in obstetrics and gynecology department in tertiary care teaching hospital

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## Abstract

**Introduction:** Antibacterial agents are one of the most frequently used drugs world wide, and contribute immensely to human health system. Maternal health is very important because both fetus and mother are at jeopardy. Many drugs are used in Obstetrics & Gynecology department but they are least studied with respect to drug utilization which is a potential tool in evaluation of health systems. Thus, present study was undertaken to analyze drug utilization pattern of Obstetrics & Gynecology Department in a tertiary care hospital.

**Methods:** This prospective study of the audit prescription was conducted for a period of three months from March 2016 to May 2016 on patients visiting the Obstetrics & Gynecology department during the study period. Patients were enrolled on the basis of inclusion and exclusion criteria.

**Results** 130 patients were analyzed. Antibiotics were prescribed for eclampsia followed by full term pregnancy (FTP) in labor, puerperal sepsis, intra-uterine death with previous LSCS with diabetes and pregnancy induced hypertension.  $\beta$ -lactams were most commonly prescribed antimicrobials to 47.46% of patients, other drugs that were commonly prescribed were proton-pump inhibitors and NSAIDs. Out of 433 drugs which were prescribed to 130 patients, 316 were antibiotics. The average numbers of antibacterial agents which were prescribed per patients per course was found to be 3.88 and average cost per prescription per day was Rs.210.50 and the average antibiotic cost per encounter was Rs.168.50.

**Conclusion:** Our study demonstrated that most of the prescriptions were found to be rational according to the use of AMAs which helps in reducing adverse events and health care cost

**Keywords:** Drug utilization, prescriptions, antimicrobials, rational.

## 1. Introduction

Antibacterial agents are the most frequently used drugs world wide, and contribute immensely to human health system. However, the consumption of antibacterial agents is closely linked to emergence and spread of resistance in commensal and pathogenic species. [1]

Antimicrobial drug use and associated cost have been on rise over the past two decade. Developing countries like India, have limited funds available for healthcare hence, it becomes important to prescribe drug rationally so as to utilize the funds optimally. [2]

Maternal health is very important as both fetus and mother are at risk. Studies in developing countries that quantify burden of obstetrics & gynecological disease in order to influence health policy with respect to obstetrics & gynecology are limited. Some of these studies have shown a high prevalence of previously unrecognized morbidity, placing a heavy burden on women. [3,4] Drugs used in obstetrics & gynecology are strong selling drugs in pharmaceutical market; but they are the least studied drugs in terms of drug utilization studies.

Drug utilization research helps to facilitate appropriate use of drugs in patient populations, so as to minimize the adverse events, drug interactions and leading to better patient outcome. [5] Therefore this study was done with the objectives of evaluating the patterns of antimicrobial prescribing to analyze drug utilization pattern of obstetrics & gynecology outpatient department (OPD) of Teerthanker Mahaveer Medical College and Research Center, Moradabad a biggest tertiary care hospital covering 7 district of Uttar Pradesh state.

## 2. Methods and material

This prospective study was conducted by the Department of Pharmacology in collaboration with the Obstetrics & Gynecology department of Teerthanker Mahaveer Medical College and Hospital, Moradabad, UP, India. The study was conducted over a period of three months from March 2016 to May 2016. The data of the patients who received antimicrobials were recorded on the basis of the inclusion and exclusion criteria and they were analyzed further for the drug utilization studies. All the patients who were admitted, in obstetrics & gynecology Department of Teerthanker Mahaveer Medical College Hospital & Research Centre, only adults' females were included. Any patient that died post-operatively before being discharged was excluded from the study, absconded/discharged against medical advice, and referred to higher center were excluded from the study.

Out of the 193 patients who visited the OPD departments of obstetrics & gynecology only 130 patients were analyzed on the basis of the inclusion and exclusion criteria. The study protocol, pro-forma, and all the other documents which were related to the study were approved by the Institutional Ethics Committee. An oral and written consent was obtained from the patients before their participation in the study.

### 2.1 Rationality

If the antimicrobial use, its route of administration, dose, frequency and its duration of use were considered as appropriate for the treatment, the therapy was considered as rational and the therapy was considered as irrational if the antimicrobial was used without indication, inappropriate

route, dose, frequency, duration or preparation for that indication.

## 3. Results

A total of around 193 patients visited the IPD department of obstetrics & gynecology over a period of 3 months, 130 patients were selected for the present study. Among the 130 patients, 84 patients were between 21-40 years of age group followed by 26 patients in 40-60 years, 20 patients in 0-20 years of age group. The total number of drugs which were prescribed to the patients was 433. Each patient, on an average was prescribed 3.88 drugs per prescription. It was observed that out of the 433 drugs which were prescribed to the patients only 21 (4.61%) were of the generic form. The routes of drug administration was oral (n=98) and intravenous (n=218). Average number of antibacterial agents which are prescribed per patient per course was found to be 2.43. The average cost per prescription per day was Rs.210.50 and the average antibiotic cost per encounter was Rs.168.50. A total of 76.92% of the prescription were found to be rational according to the use of AMAs and in 23.08% of the patients, the antimicrobial therapy was considered as irrational. (Table 1)

**Table 1: Prevalence and indication of antimicrobials**

Indicators	No. of Patients
1. Average number of drugs per prescription (encounter)	3.88
2. Percentage of drugs prescribed by generic name;	4.61
3. Number of encounters resulting in prescription of an injection;	68.98%
4. Average drug cost per encounter.	210.50
5. Average antibiotic cost per encounter	168.50
<b>Prevalence of use</b>	
1. Total no. of Prescription	130
2. Total no. of AMAs prescribed	360
3. Mean no. of AMAs	2.43
<b>Routes of Drug administration</b>	
<b>Antibiotics (291)</b>	
1. Oral	218
2. Parenteral (i.v)	
<b>Purpose of use of AMAs</b>	
1. OPD patients	55
2. IPD patients (Post operated and Conservatively managed)	75
3. Total No. of patients	130

Eclampsia (23.8%) was the most common condition for prescription of antibiotics followed by full term pregnancy (FTP) in labor (23.2%), puerperal sepsis (14.6%), intra-uterine death with previous LSCS with

diabetes (9.23%), pregnancy induced hypertension with oligohydromnios (8.43%), 41 weeks pregnancy with polyhydramnios (7.69%) and 8<sup>th</sup> month amenorrhea with HBsAg carrier with intra hepatic cholestasis (6.15%). (Table 2)

**Table 2: Diseases wise distribution of patients**

S. No	Disease/diagnosis	No. of patients (%)
1	Puerperal Sepsis	19 (14.6)
2	Eclampsia	31 (23.8)
3	Full Term Pregnancy (FTP) in labor	30 (23.2)
4	Intra Uterine Death with previous LSCS with Diabetes	12 (9.23)
5	Pregnancy induced Hypertension with Oligohydromnios	11 (8.43)
6	41 weeks Pregnancy with Polyhydramnios	10 (7.69)
7	Total abdominal hysterectomy	9 (6.92)
8	8 <sup>th</sup> month amenorrhea with HBsAg carrier with intra hepatic cholestasis	8 (6.15)

A total 433 drugs are prescribed; out of them 316 were antibiotics. The most commonly prescribed antimicrobial were  $\beta$ -lactam (n=150) followed by Quinolones (n=72), Aminoglycosides (n=52), and Nitroimidazoles (n=36). (Table 3) The most commonly used  $\beta$ -lactam were the Cephalosporin (Ceftriaxone+Salbactam (n=88) and Cefuroxime (n=40)) followed by the Quinolones (Levofloxacin (n=52)), Aminoglycosides (Amikacin (n=58)) and Nitroimidazoles (Metronidazole (n=36)). (Table 3)

Among the concomitant medication, NSAIDS in 69.23 per cent of cases followed by the proton pump inhibitors which were prescribed in 30.76% of cases.

**Table 3: Antimicrobials prescribed in obstetrics & gynecology department**

Class	Antibacterial agents	No. of agents prescribed Consumption (%)
$\beta$ -lactam	Piperacillin+tazobactam	22 (6.96)
	Ceftriaxone+Salbactam	88 (27.84)
	Cefuroxime	40 (12.65)
	<b>Total</b>	15 (47.46)
Quinolones	Levofloxacin	52 (16.75)
	Ofloxacin	20 (6.32)
	<b>Total</b>	72 (22.78)
Aminoglycosides	Amikacin	58 (18.35)
Nitroimidazoles	Metronidazole	36 (11.39)

## 4. Discussion

The influence of the Pharmaceutical Companies on the prescription patterns of medical practitioner has increased specially in developing countries like India. Hence, drug utilization studies analyse the utilization of drugs with burden of diseases so as to facilitate the rational use drug in population.

Most of the patients in our study were in the age groups of 21-40 years followed by 41-60 years, the study matches with a study done Shalini *et al* which reported 70% patients in the age group of 20-29 years. [6] The results of our study in concordance with Baig MS *et al* where the mean age of presentation was 30.19+9.83 years and the most common age group was between 18-30 years [7] and another study done by Kaur *et al.* where the mean age of women attending obstetrics and gynecology OPD was 29.80  $\pm$  6.293 years. [8] While in our study age range is used this is more predictable as it includes 21-40 of age groups.

Our study demonstrated that 71.59% of all prescription drugs were antibiotics and  $\beta$ -lactams were most commonly prescribed drugs accounting for 47.46% of all prescribed drugs, the results of our study are different to a study done by Baig MS *et al* where they found the most commonly prescribed group was metronidazole followed by ciprofloxacin. [7] Our results are also different from another study done by Shah BK *et al.* which demonstrated that ciprofloxacin (60.90%) was most commonly prescribed drug followed by ampicillin (54.54%) and metronidazole (39.69%). [9] Ampicillin, metronidazole, ciprofloxacin, gentamicin, and cefazolin were the most common prescribed antibiotics in obstetrics and gynaecology department in a study which is different from our study were the most common used drugs were ceftriaxone+sulbactam, cefuroxime, levofloxacin, amikacin and metronidazole. [9]

The results of our study are also in accordance with study done by Dhaubhadel *et al*, which showed that pain was the most distressing symptom and pelvic pain being one of the most common reasons for obstetrics and gynaecology consultation. [10] In our study the most common concomitant drug prescribed was NSAIDs is consistent with the findings of Dashputra AV where diclofenac sodium of the NSAID group was the most commonly used analgesic. [11]. The average number of drugs per prescription in our study was 3.48 which is quite different from the findings of Gyawali S *et al.* which showed that average number of drugs per prescription was 10.60. [12] As per the recommendations the limit to number of drugs prescribed per prescription should be 2, because of increased risk of drug interactions. The high number of drugs per prescription might be due to unawareness of the

obstetrics & gynaecological diseases in patients hence, there is less follow-up which contributes to increase in drugs per prescription. [13] Our study demonstrated that cost for antibiotics was Rs.168.50/- which is quite similar to study conducted by Shah *et al*, which demonstrated that average drug cost for antibiotics was Rs.169.42/-. Our study focused on understanding drug prescription and prescription trends with respect to Obstetrics & Gynaecology Department. It is only by drug utilization studies that burden of diseases and corresponding utilization of drugs in obstetrics & gynaecology can be measured.

To conclude our study demonstrated that most of the prescription were found to be rational according to the use of AMAs which helps in reducing adverse events and health care cost. Drug and therapeutics committees should be established in hospitals to monitor and implement interventions to improve the use of medicines. Proper measures should be taken to avoid the inappropriate use of antibiotics.

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