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Drug utilization study in department of obstetrics and gynecology at a tertiary care teaching hospital

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Abstract

Objective: To evaluate the trend of medication prescriptions in the department of obstetrics and gynaecology at a tertiary care teaching hospital.

Methods: A prospective observational study on drug utilization patterns was done in the department of obstetrics and gynaecology at a tertiary care teaching hospital for 18 months. All inpatients and outpatients were included. After gaining informed consent, patients who met the inclusion criteria were enrolled. Medication orders were observed for prescription patterns. WHO Prescription indicators were used for analysis.

Results: A total of 618 prescriptions were collected. A total of 2559 drugs were prescribed, which included 1159 (45.29%) minerals and vitamin supplements, 603 (23.57%) antibiotics, 334 (13.05%) autacoids, 318 (12.43%) gastrointestinal drugs, 100 (3.91%) drugs affecting blood, 28 (1.09%) endocrine drugs, and 17 (0.66%) cardiovascular drugs. The average number of drugs per prescription in this study (4.13) is higher than the standard set by WHO (1.6-1.8). The percentage of patients prescribed with injectables is 38.83%. This is also high when compared with the range of the standard set by WHO. Around 77% of drugs were prescribed from the WHO Essential Medicine List.

Conclusion: The results of our study highlight several areas that need improvement; most importantly, polypharmacy was practiced as the average number of drugs (4.13) per prescription when compared with a standard set by WHO. Another area, that is, a percentage

of drugs prescribed by injection is high, which also needs to be decreased. Vitamin B complex, vitamin C, pantoprazole, ferrous sulphate, and calcium were the most frequently prescribed drugs. The drug prescribed from the WHO Essential Medicine List was comparatively lower. So, it emphasises more on prescribing more drugs from the essential drug list to meet the standards of WHO. The overall drug use pattern is rational.

Keywords: Drug utilization study, Obstetrics, Gynecology

Introduction

Drug utilization is defined as "the prescribing, dispensing, administering, and ingesting of drugs.". The World Health Organization (WHO) expands on this definition by including outcome variables in their definition. Drug utilization is defined by the WHO as the "marketing, distribution, prescription, and use of drugs in society, with special emphasis on the resulting medical, social, and economic consequences.[1]

Given that pregnancy's unique physiological conditions impact the pharmacokinetics of pharmaceuticals and that some drugs can harm the baby, pharmacological treatment during pregnancy poses unique challenges. [2] The pregnancy period comprises 40 weeks. Medical researchers isolate this period into three trimesters. The main trimesters comprise 0-12 weeks, trailed constantly, which comprise 13-28 weeks, and the third is for 29-40 weeks.[3] Total avoidance of pharmacological treatment in pregnancy is not possible and may be dangerous because some women enter pregnancy with medical conditions that require ongoing and episodic treatment (e.g., asthma, epilepsy, hypertension).

There are usually two individuals involved in ensuring the safety of medication taken during pregnancy. The developing "co-treated" foetus is at its most vulnerable point in development. Unlike in children or adults, side effects affecting the embryo cannot be detected early enough to prevent potentially life-long damage. Thus, medication safety during pregnancy is of utmost importance. [4]

Gynaecological diseases are common in India because of socioeconomic, hygienic, and literacy problems. There are few comprehensive community-based studies in low-income countries that express the burden of gynaecological disease in order to influence health policy with respect to gynaecology.[5] Most of the gynaecological problems are treated with antibiotics, so antibiotics should be prescribed appropriately because nowadays antibiotic resistance is a worldwide problem.[6]

Postoperative utilization of drugs is very common. Drugs are prescribed post-operatively to reduce pain, prevent infection, and prevent nausea and vomiting. In most hospitals, antimicrobial therapy was reportedly given for 7–11 postoperative days. [7] The principal aim of drug utilization research is to facilitate the rational use of drugs in populations.

Materials and Methods

A prospective drug utilization study was conducted at the department of pharmacology of a medical college attached to a tertiary care district hospital. Prior permission from the Institutional Ethics Committee (IEC) was taken for conducting the study. The study was performed over a period of 18 months. Informed consent was taken from the patient for the study.

All obstetrics and gynaecology department outpatients & inpatients receiving any category of drug therapy were included in the study. Those patients who are not willing to take part in the study were excluded. A total of 618

prescriptions were collected. Data like name, age, sex, OPD no., and ongoing treatment were recorded from the case record of patients. Prescription details, including the generic/brand name of the drug, the number of drugs prescribed, the dosage form, the route of administration, and the dose prescribed, were recorded. Categorical data was expressed as actual numbers and percentages. The drugs prescribed will be presented as frequency and percentage. Data were entered and analysed with Microsoft Excel. The medication charts were assessed for assessing medications prescribed with WHO prescribing indicators as under:

- Age wise distribution
- Average number of drugs per encounter
- Total number of drugs per prescription
- Percentage of drugs prescribed by generic name
- Percentage of encounters with an antibiotic prescribed
- Percentage of encounters with FDCs prescribed
- Average number of encounters with injection prescribed
- Prescribing frequency of drugs
- Classification of drugs used according to class of drug
- Percentage of route of administration of drugs
- Percentage of drugs prescribed from essential medicine list (EML)
- Average drug cost per encounter
- ATC, Prescribed Daily Dose (PDD) and Defined Daily Dose (DDD) of drugs

Result and Discussion

In this study, we aimed to assess drug utilization patterns by using WHO core prescribing indicators. Out of 618 women, the majority of women, 258 (41.74%), were in the age group of 26-35 years, followed by 240 (38.83%) in the 15-25 years. (Table 1) Mean age (mean ± SD) was 29.82 ± 9.44 years at 95% confidence limit. The average number per encounter is 4.13 in our study. (Table 4) Few studies supported our finding and showed that there was a practice of polypharmacy. A study conducted by Sharma and Jhanwar found that the average number of drugs prescribed was 5.2. [8]

Around 267 (43.20%) prescriptions were prescribed 4 drugs, followed by 126 (20.38%) prescriptions prescribed 5 drugs. Only 12 prescriptions were prescribed for 8 (1.94%) drugs. (Figure 1) A study conducted by Nandeshwar and Chakravorty found that the total number of drugs per prescription prescribed was 4 in 132 (44%) prescriptions, followed by 5 drugs per prescription in 53 (17.66%) prescriptions.[9]

The majority, 2421 (94.60%), of drugs were prescribed by generic name. (Table 4) Prescription of drugs by generic name is beneficial for rationalisation and to decrease the cost of drug therapy. [10] Besides this, generic prescriptions are clear to understand and reduce the risk of error during dispensing. A study conducted by Arthy S. et al. found that 45% of drugs were prescribed by the generic name. [11]

Inappropriate prescription of antibiotics can potentially lead to antibiotic resistance. Antibiotic resistance increases the necessity to require more costly antibiotics to manage infections. Among 300 (48.54%) prescriptions, around 150 (24.27%) were prescribed with 2 antibiotic drugs. (Table 2) There was a similar finding in a study done by Balla et al., in which 124 (50.01%) prescriptions were prescribed antibiotics, which was nearby to our study result. [12]

Only 54 (8.73%) prescriptions were prescribed FDCs. A study conducted by Manjunatha C. H. et al. found a similar result, in which around 12% of prescriptions

were prescribed FDC. [13] Around 240 (38.83%) encounters were prescribed injections. (Table 4) Among them, 132 (21.35%) encounters were prescribed 2 injections, followed by 54 (8.73%) encounters that were prescribed 3 injections. (Figure 2) A similar result was found in a study conducted by Makiabadi et al., in which 399 (39.74%) encounters were prescribed by injections. [14]

A total of 2559 prescribed drugs were in the present study. Among them, the most commonly prescribed drug class was miscellaneous, about 1159 (45.29%) drugs, in which the most commonly prescribed drug was Vitamin B complex, followed by antimicrobial agents (603, 23.57%), autacoids (334, 13.05%), gastrointestinal (318, 12.43%), drugs affecting blood (100, 3.91%), endocrine (28, 1.09%), and cardiovascular (17, 0.66%). (Table 3) A similar result was found in a study conducted by Nandeshwar and Chakravorty, in which 322 (42.70%) drugs were from minerals and vitamins; antibiotics 185 (24.53%), gastrointestinal 105 (13.92%), and autacoids 76 (10.07%). [9]

The most commonly prescribed route of administration was oral (78.51%), followed by parenteral (21.14%). A study conducted by Gyawali et al. found that around 72% of drugs were prescribed by the oral route, followed by 28% by the parenteral route.[15] In the present study, 31 (72%) drugs were prescribed from the WHO Model List of Essential Medicines—23rd List (2023), and 33 (77%) drugs were prescribed from the National List of Essential Medicines (NLEM) of India, 2022.[16] (Table 4) The practice of prescribing drugs from the essential drug list is not sufficient to meet WHO criteria in our tertiary-level hospital. However, this finding is justifiable because in tertiary-level hospitals, a variety of cases are treated, and only limited drugs are available in the essential drug list. So, it is not always necessary to prescribe drugs only from that list. [17]

In our study, the highest ratio of PDD/DDD was seen in folic acid, which was 12.5, followed by progesterone 4.44, doxycycline 3, vitamin C 2.5, and other drugs. The PDD/DDD ratio range is from 0.33 to 2. Anatomical Therapeutic Chemical (ATC) code is a unique code assigned to a medicine according to the organ or system it works on and how it works. [18] Defined Daily Dose (DDD) is the assumed average maintenance dose per day for a drug used for its main indication in adults. Prescribed Daily Dose (PDD) is defined as the average dose prescribed according to a representative sample of prescriptions. [19]

Drugs which used in the labour room and OB-GYN ICU, like oxytocin, prostaglandins, ergot derivatives, etc., and which were continued to be used for chronic problems (thyroid, bronchial asthma, epilepsy, tuberculosis, cardiac problems, mental disorder, etc.), were not included in our study.

Conclusion

The results of our study highlight several areas that need improvement; most importantly, there is polypharmacy practiced as the average number of drugs (4.13) per prescription when compared with a standard set by WHO. Another area that is a percentage of drugs prescribed by injection is high, which also needs to decrease. Vitamin B complex, vitamin C, pantoprazole, ferrous sulphate, and calcium were the most frequently prescribed drugs. The drug prescribed from the WHO Essential Medicine List was lower. So, it emphasises more on prescribing more drugs from the essential drug list to meet the standards of WHO. The overall drug use pattern is rational.

Table 1: Age Group-Wise Distribution

Age Group (Years)	Number of women n (%)
15-25	240 (38.83%)
26-35	258 (41.74%)
36-45	90 (14.56%)
46-55	15 (2.42%)
56-65	12 (1.94%)
Above 65	3 (0.48%)
Total	618

Figure 1: Number of Drugs Per Prescription

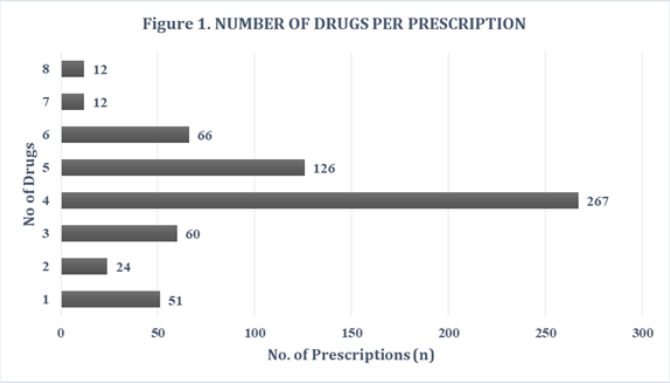

Table 2: Number of Antibiotics Per Prescription

No. of antibiotics per encounter	No. of prescriptions (n)	Percentage (%)
1	81	13.10
2	150	24.27
3	66	10.67
4	3	0.48
Total	300	48.54

Figure 2: Number of Injections Per Encounter

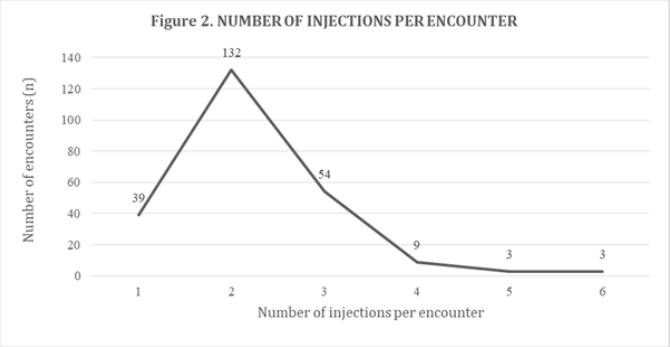

Table 3: Different Classes of Drug

Drug Class	No. of drugs (n)	Percentage (%)
Antimicrobial	603	23.57
Autacoids	334	13.05
Gastrointestinal	318	12.43
Drugs affecting Blood	100	3.91
Endocrine	28	1.09
Cardiovascular	17	0.66
Miscellaneous (Minerals & Vitamins)	1159	45.29
Total	2559	100

Table 4: Who Core Prescribing Indicators of Drugs

Prescribing Indicators	Total n (%)
Average number of drugs per encounter	4.13
Drugs prescribed by generic name	2421 (94.60)
Encounters with injections	240 (38.83)
Encounters with FDCs prescribed	54 (8.73)
Drugs prescribed from WHO essential drug list	31 (72)

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