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# Study of drug utilization pattern in the gynecology outpatient department of a rural tertiary care teaching hospital of Maharashtra

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## Abstract

### Context

Drug utilization studies help medical practitioners and health policy makers to decide an individualized specific drug pattern for a particular disease or disease group.

### Aims

This study was planned to study drug utilization patterns among patients visiting the Gynecology Outpatient Department (OPD) of a rural tertiary care teaching hospital.

### Settings and design

This was a prospective, descriptive, cross-sectional, observational study conducted over 2 months in the gynecology Outpatient Department of a rural tertiary care teaching hospital in Maharashtra state.

### Patients and methods

A total of 200 prescriptions of patients were studied. Various prescribing indicators by WHO were used for the analysis.

### Statistical analysis used

Statistical analysis was primarily descriptive with values mainly expressed as percentages using Microsoft Excel.

### Results

In majority of the rural middle-aged patients, all patients received 3.8 drugs per encounter indicating a trend of polypharmacy. Majorly, the drugs were prescribed by brand names than generic names, which lead to extra cost to the patients. The most commonly reported diseases were reproductive tract infections, sexually transmitted infections, pelvic inflammatory diseases, and dysmenorrhea. The most commonly prescribed groups of the drug were antibiotics majorly metronidazole, doxycycline followed by clindamycin followed by NSAIDs followed by iron, folic acid, and calcium.

### Conclusion

It can be concluded that physicians prescribe medicines based on their knowledge, previous experience with the drug, their perceptions, habits, and peer influences. Drug utilization studies like this are important for continuous approaches toward a positive change in the use of medicines and promotion of rational use of medicines in the community.

**Keywords:** Antibiotics, polypharmacy, RTIs

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## INTRODUCTION

Drugs are now and always an essential part of health-care management setups of all levels in Outpatient Departments (OPD), Inpatient Departments, ICU, etc. But their irrational use has been a global issue. The WHO has defined rational use of drugs as patients receiving medications appropriate to their clinical needs in doses that meet their own individual requirements for an adequate period of time and at the lowest cost to them and their community. Appropriate use of drugs helps in improvement of quality of health and medical care for patients and community, where we can notify whether a facility is exceeding or underperforming by the defined norms of practice and to obtain baseline information for continuous monitoring [1]. This requires a thorough understanding of various aspects of the disease as well as the drugs by the treating physician, which finally provide safe and efficacious drugs in a cost-effective manner to the patient. Therefore, rational prescribing of drugs plays a pivotal role in successfully treating the disease with minimal adverse effects and skillful use of inadequate resources that are available in a developing country like India [2].

It is well documented that a safe and effective drug therapy is possible only when patients are prior informed about the medications and their uses. The five important criteria for rational drug use are accurate diagnosis, proper prescribing, correct dispensing, suitable packing, and patient adherence [3]. But it is observed that most of the prescribers throughout the world specifically in developing countries like India are not involved in the rational use of medicines [4]. Drugs that are ineffective, unnecessary, unrelated to diagnosis, medically inappropriate, expensive, and multiple drugs are being prescribed [5].

Use of irrational drugs has lot of adverse consequences like delay or inability in curing the disease, more chances of adverse effects, loss of man days, increased incidence of morbidity and mortality, emergence of microbial resistance, financial loss to the patient and community, loss of patients' confidence in the doctor, lowering of health standards of patients and community, and perpetuation of public health problem [5]. There are various factors that are responsible for irrational drug prescription such as vigorous drug promotion by pharmaceutical industries, unethical inducement to doctors and pharmacists, the belief that always a new drug is better than an established drug by the doctor and pill for every ill-belief of patients [6].

Often the way a health-care professional prescribes drugs indicate his or her ability to choose from the unnumbered drugs that are available in the market for that particular disease and to determine the ones which will be most accurate for their needs [7]. However, it is observed that most of the prescribers throughout the world specifically in developing countries like India are many times not involved in the rational use of medicines [4].

WHO evolved a set of core prescribing indicators for measuring the degree of polypharmacy, the tendency to prescribe drugs by generic name, the level of use of antibiotics and injections, and the degree to which the prescribing practice is conformed to the essential drug list, formulary or standard treatment guidelines [8]. Nowadays, drug utilization studies are used as a potential tool in the evaluation of health-care systems as well as to ascertain the role of drugs in society [9].

Gynecological disorders are common worldwide and recent studies have revealed their high prevalence and their unrecognized morbidity, which places a heavy burden on the health of women [10]. As per a recent data provided by a market research firm, drugs used for gynecological disorders are one of the highest selling drugs and rank eighth overall [11]. However, these are the least studied drugs in terms of their prescribing patterns. Analysis of their prescribing pattern can be conducted to assess the rational prescribing skills of clinicians and are helpful for assessing the beneficial and adverse impacts of the prescribed drugs [12].

With this background, the present study was undertaken to analyze the drug utilization pattern of gynecology OPD in a tertiary care teaching hospital with the principal aim of drug utilization research being to facilitate appropriate use of drugs in patient populations, minimize the adverse events and drug interactions leading to better patient outcome.

## PATIENTS AND METHODS

The present study was a prospective, descriptive, cross-sectional, observational study over a duration of 2 months. This study was conducted in the gynecology OPD at a tertiary care teaching hospital in the state of Maharashtra, India. The sampling was drawn by the convenient method with a sample size of 200 prescriptions of patients attending the gynecology OPD.

Prescriptions of all the patients attending the gynecology OPD during the study duration were included in the study. Prescriptions with incomplete information were excluded. First 200 prescriptions of patients attending the gynecology OPD were taken and their data was screened and analyzed. Patient-related information such as age, diagnosis, urban/rural, drug-related information like the number of drugs prescribed, drug dosage form, route of administration, drug prescription by generic or brand names were collected on a customized data collection sheet.

To analyze the prescription pattern, WHO prescribing indicators for the study were selected as follows [13].

The parameters studied were the average number of drugs prescribed per prescription per encounter, percentage of encounters with an antibiotic prescribed, percentage of encounters with an injection prescribed, percentage of drugs prescribed by generic name, and percentage of drugs prescribed from the Indian National List of Essential Medicine (NLEM) 2011.

The data collection was started only after approval of the study by the Institutional Ethics Committee. The identity of all the patients was kept confidential. The voluntariness of the patient’s participation was respected by the principal investigator.

## RESULTS

The obtained data was entered in Microsoft Excel. Statistical analysis was primarily descriptive with values mainly expressed as percentages.

In this study, a total of 200 gynecology prescriptions were analyzed. Among all the prescriptions, 180 (90%) were from the rural area and 20 (10%) were from the urban area while the number of patients in 15–30 age group was 51 (25.5%), 31–50 age group was 135 (67.5%), and more than 50 years was 14 (7%) as shown in Fig. 1.

The average number of drugs per encounter was found to be 3.8 as shown in Table 1. The percentage of drugs prescribed by generic names was only 36.5% and the essential drug list was 90.93%. Percentage of encounter with antibiotics and injections were 36.5 and 1%, respectively.

In the present study, most common complaints of women attending the gynecological OPD were of pelvic inflammatory disease (30, 15%) and dysfunctional uterine bleeding (30, 15%), followed by uterine prolapse (27, 13.5%), fibroid uterus (21, 10.5%), urinary tract infection (14, 7%), and ovarian cyst (13, 6.5%). Adenomyosis and menorrhagia were present in 10 (5%) women, followed by leucorrhoea (eight, 4%). Polycystic ovarian disease, chronic cervicitis, and polyp (endometrial as well as cervical) were present in six (3%) women as shown in Table 2. Others like polymenorrhagia, dysmenorrhoea, cervical erosions, postmenopausal symptoms, dermoid cysts, irregular menses, infertility, candidiasis, nabothian cysts, and bartholin cysts were present in the remaining 19 (9.5%) women.

The most commonly prescribed classes of drugs in the gynecology OPD were antibiotics (19.71%, 150), followed by

NSAIDs (18.26%, 139), and vitamins and minerals (17.48%, 133). The remaining prescribed classes of drugs were proton-pump inhibitors (6.04%, 46), antifibrinolytics as well as hormones (5.65%, 43) each, antispasmodics 4.86% (37), antihistaminics 4.59% (35), antifungals 4.33% (33), antioxidants 1.8% (13), urinary alkalinizers and anticholinergics 1.57% (12) each. Others like local anesthetics, beta blockers, calcium channel blockers, angiotensin receptor blockers, bacillus, antiseptic solution, oral anticoagulants, laxatives and prokinetics 5.38% (41) were least prescribed drugs (Table 3).

Among 150 antibiotics that were commonly prescribed in gynecology OPD, most common antibiotics were metronidazole ( $n=37$ , 24.66%), followed by doxycycline ( $n=35$ , 23.33%) and clindamycin ( $n=23$ , 15.33%). The remaining prescribed antibiotics were cefixime ( $n=16$ , 10.66%), ofloxacin ( $n=10$ , 06.66%), ornidazole, and azithromycin ( $n=06$ , 04%) each and secnidazole and norfloxacin ( $n=05$ , 03.33%) each. Others like albendazole along with ciprofloxacin and levofloxacin ( $n=02$ , 01.33%) each and amoxicillin ( $n=01$ , 00.66%) were the least prescribed (Fig. 2).

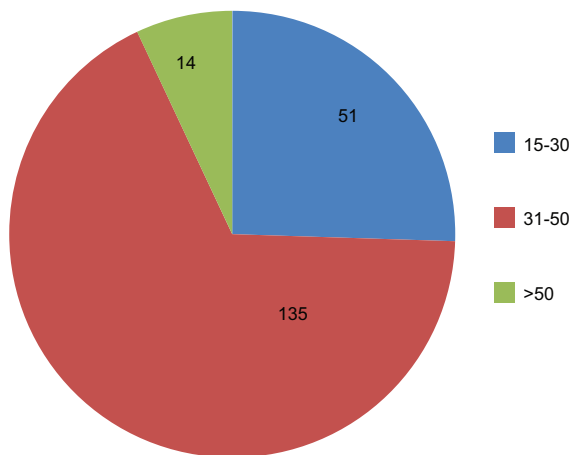
This was followed by studies on the prescribing pattern of NSAIDs. Among 139 NSAIDs that were commonly prescribed

**Table 1: WHO prescribing indicators used for the assessment of drug use pattern**

Prescribing indicators	Total number	Value	Standard derived by WHO
Average number of drugs per encounter	761	03.8	1.6-1.8
Percentage of encounter with antibiotics	73	36.5%	20-26.8%
Percentage of encounter with injections	02	01%	13.4-24.1%
Percentage of drugs prescribed by generic name	193	25.36%	100%
Percentage of drug from essential drug list	692	90.93%	100%

**Table 2: Distribution of diagnosis of patients**

Diagnosis	n (%)
Pelvic inflammatory disease	30 (15)
Dysfunctional uterine bleeding	30 (15)
Uterine prolapse	27 (13.5)
Fibroid uterus	21 (10.5)
Urinary tract infection	14 (07)
Ovarian cyst	13 (06.5)
Adenomyosis	10 (05)
Menorrhagia	10 (05)
Leuorrhoea	08 (04)
Chronic cervicitis	06 (03)
Polyp (endometrial + cervical)	06 (03)
Polycystic ovarian disease	06 (03)
Others	19 (09.5)
Total	200 (100)



**Figure 1: Age wise distribution of patients.**

in the gynecology OPD, the most common NSAIDs were paracetamol ( $n = 69$ , 49.64%), followed by mefenamic acid ( $n = 42$ , 30.21%), diclofenac ( $n = 26$ , 18.70%), and aceclofenac ( $n = 02$ , 01.44%) (Fig. 3).

Among 133 vitamins and minerals that were commonly prescribed in the gynecology OPD, the most common were iron ( $n = 37$ , 27.82%), followed by folic acid ( $n = 36$ , 27.07%) and calcium ( $n = 22$ , 16.54%). The remaining prescribed vitamins and minerals were vitamin B ( $n = 18$ , 13.53%), magnesium ( $n = 12$ , 09.02%), vitamin E ( $n = 04$ , 03.01%), and vitamin C as well as vitamin D3 ( $n = 02$ , 01.5%) each in the decreasing order (Fig. 4).

Next studied was the various dosage forms of the drugs that were prescribed in this study, which clearly shows that the top dosage form was tablet ( $n = 639$ , 83.96%), which was followed by pessary ( $n = 55$ , 7.22%) and capsule ( $n = 37$ , 4.86%). The least prescribed dosage forms in decreasing order were syrup ( $n = 14$ , 1.83%), powder ( $n = 12$ , 1.57%), injection, and gel ( $n = 2$ , 0.26%) each (Table 4).

## DISCUSSION

Drug utilization studies analyze the utilization of drugs with a burden of diseases so as to facilitate the rational use of drug in the population. This has become very essential in the modern era where the influence of many factors like pharmaceutical companies, internet sources, etc., can effectively change the prescribing pattern of medical practitioners including gynecologists.

In this study, out of 200 patients 90% patients were from rural areas and 10% were from urban area. This indicates that majority of rural patients depend on the peripheral/primary health services for gynecological diseases. The mean age of presentation was  $38.18 \pm 11.18$  years, while the most common

age group was 31–50 years. In studies carried out by Kaur *et al.* [14] the mean age of women attending the gynecology OPD was  $29.80 \pm 6.293$  years.

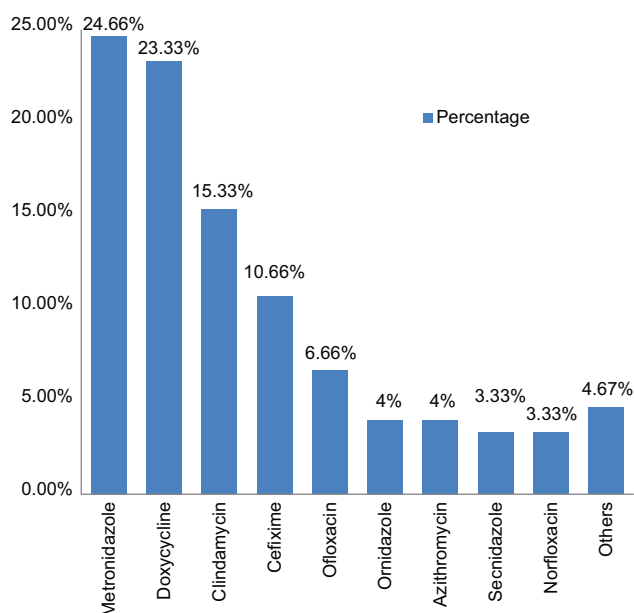
The WHO developed a core prescribing indicator to measure the degree of polypharmacy, the tendency to prescribe drugs

**Table 3: Frequently prescribed classes of drugs**

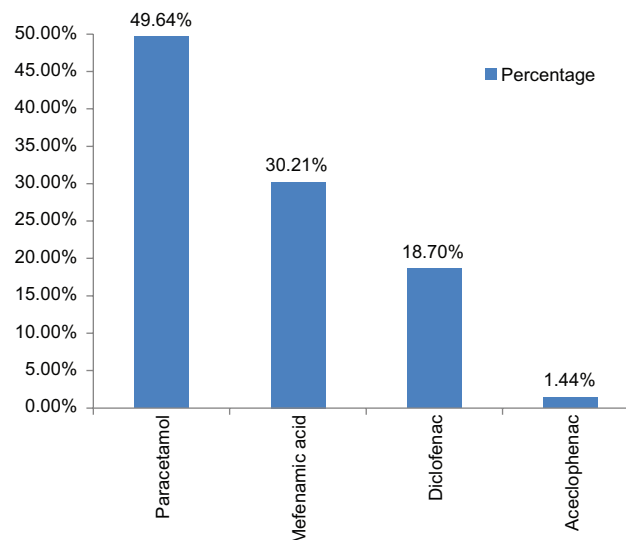
Class of drug	n (%)
Antibiotics	150 (19.71)
NSAIDS	139 (18.26)
Vitamins and minerals	133 (17.48)
Proton-pump inhibitors	46 (06.04)
Antifibrinolytics	43 (05.65)
Hormones	43 (05.65)
Antispasmodics	37 (04.86)
Antihistamines	35 (04.59)
Antifungals	33 (04.33)
Proteolytic enzymes	23 (03.02)
Antioxidants	13 (01.80)
Urinary alkalinizers	12 (01.57)
Anticholinergics	12 (01.57)
Others	41 (05.38)
Total	761 (100)

**Table 4: Frequently prescribed dosage forms**

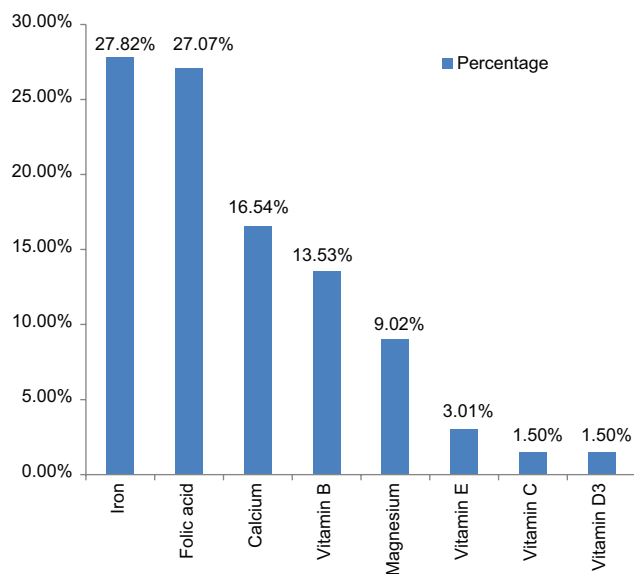
Dosage form	n (%)
Tablet	639 (83.96)
Pessary	55 (07.22)
Capsule	37 (04.86)
Syrup	14 (01.83)
Powder	12 (01.57)
Injection	02 (00.26)
Gel	02 (00.26)
Total	761 (100)



**Figure 2: Frequently prescribed antibiotics.**



**Figure 3: Frequently prescribed NSAIDs.**



**Figure 4:** Frequently prescribed vitamins and minerals.

by generic name, and the overall level of use of antibiotics and injections. The degree to which the prescribing practice conformed to the standard treatment guidelines or essential drug list or formulary were also evaluated by searching for the number of drugs prescribed from the Indian National List of Essential Medicine (NLEM) 2011 and WHO list of Essential Medicines 2011. The average number of drugs per encounter was found to be 3.8, more than the standard derived value. This is an indicator of polypharmacy. It is recommended to limit the number of drugs prescribed per prescription should be two, because of the increased risk of drug interactions [15].

Around 40% of the women have STI at a given point in time and only 1% completes full treatment of both the partners [16]. Due to lack of awareness of gynecological diseases there is poor follow-up, which is a contributing factor for the increase in drugs per prescription. The percentage of encounter with antibiotics was also high. The percentage of drugs prescribed by generic name was found to be less in this study (25.36%). There is no uniform report regarding the use of generic drugs as different trends are observed in different countries and regions but ideally all the drugs should be prescribed by generic name [17].

## CONCLUSION

Physicians prescribe medicines based on their knowledge, previous experience with the drug, their perceptions, habits, and peer influences. The present study aimed to evaluate the impact of prescriber education on the rational use of medicines. Physician education that brings positive changes in prescription habits leads to significant improvement in the rational use of medicines. Activities like workshops and CMEs would be an effective tool of improvement. We recommend that interventional activities should be conducted at tertiary

care centers on a regular basis. Such interventional activities bring the desired positive change in the use of medicines and can promote the rational use of medicines in the community.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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