

## A prospective study of prescribing pattern of drugs among in-patients of gynaecology department in a tertiary care teaching hospital in South India

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### ABSTRACT

**Background:** Analysis of prescribing pattern can be helpful for the assessing the beneficial and adverse impacts of the prescribed drugs. Even though drugs used for gynaecological disorders are one of the commonly used, they are least studied in terms of prescribing patterns. Hence the present study was planned to analyse the prescribing pattern of drugs among in-patients of gynaecology department in our institute.

**Methods:** A prospective observational study was carried out in a total of 162 in-patients of department of gynaecology in our institute for a period of one year. Along with baseline demographic data, the total number and categories of drugs prescribed, percentage of individual drugs in each category, their dosage forms, percentage of drugs prescribed by generic name and drugs prescribed from essential drug list were analysed.

**Results:** Overall a total of 1647 drugs were prescribed. Antimicrobial agents (35.76%), vitamin and mineral preparations (28.29%) and anti-ulcer drugs (10.32%) were the top three categories of drugs prescribed in our study. Metronidazole (27.34%) was the most commonly prescribed antimicrobial drug whereas ferrous sulphate (31.97%) was the highest prescribed vitamin and mineral preparation. Among the anti-ulcer drugs, ranitidine (89.42%) was the most frequently prescribed drug. Most commonly used analgesic was diclofenac (59.05%), antiemetic was ondansetron (77.92%) and intravenous fluid was ringer lactate (37.03%). Tablet was the most common dosage form (38.01%) followed closely by injection (33.27%). The percentage of drugs prescribed by generic name was 26.17% and from essential drug list was 84.86%.

**Conclusions:** Antimicrobial agents and vitamins and mineral preparations were the most commonly prescribed drugs. Usage of injections should be reduced as they were relatively more commonly prescribed in our study. Prescription of drugs by generic names must be increased substantially to reduce the economic burden on patients.

**Keywords:** Prescribing pattern, Antimicrobial agents, Generic name, Essential drug list

### INTRODUCTION

Often the way a health care professional prescribes the drugs indicate his or her ability to choose from the myriad of drugs that are available in the market for that particular disease and to determine the ones which will be most suitable for their needs.<sup>1,2</sup> This requires a thorough understanding of various aspects of both the disease and the drugs by the treating physician and finally providing the patient with safe and efficacious drugs in a cost

effective manner. Therefore, rational prescribing of drugs plays a pivotal role in not only successfully treating the disease with minimal adverse effects but also skilfully using the meagre resources that are available in a developing country like India.<sup>3</sup>

According to World Health Organization (WHO) rational use of drugs is defined as “patients receiving medicines appropriate for their clinical needs, in doses that meet their individual requirements, for an adequate period of

time and at the lowest cost to them and their community".<sup>4</sup> But it is observed that most of the prescribers throughout the world specifically in developing countries like India are not involved in rational use of medicines.<sup>5</sup> Drugs which are ineffective, unnecessary, unrelated to diagnosis, medically inappropriate, expensive and multiple drugs are prescribed.<sup>6</sup>

There are various factors which 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.<sup>7,8</sup> Use of irrational drugs has lot of adverse consequences like delay or inability in curing the disease, have more chances of adverse effects, loss of man days, increased incidence of morbidity and mortality, emergence of microbial resistance, financial loss to patient and community, loss of patients confidence in the doctor, lowering of health standards of patients and community and perpetuation of public health problem.<sup>4,6</sup>

Gynaecological disorders are common worldwide and recent studies have unmasked the high prevalence and their unrecognized morbidity which places a heavy burden on health of women.<sup>9,10</sup> As per a recent data provided by a market research firm, drugs used for gynaecological disorders are one of the highest selling drugs and rank eighth overall.<sup>11</sup>

However they 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 the assessing the beneficial and adverse impacts of the prescribed drugs.<sup>12-14</sup> Hence the present study was planned to analyse the prescribing pattern of drugs among inpatients of Gynaecology department of our institute.

## METHODS

This is a prospective observational study which was carried out in a total of 162 inpatients of department of gynaecology of our institute, which was a tertiary care teaching hospital in a coastal town of south India. The duration of study was for one year i.e., from February, 2014 to January, 2015. Prescriptions of all the patients with age greater than 18 years who were admitted as inpatients in gynaecology department and those who agreed to participate in the study were included and the prescriptions of patients who were less than 18 years or those with incomplete data and prescriptions of those patients who did not showed interest to participate in the study were excluded from analysis.

A written informed consent to participate in the study was obtained from all the patients who participated in the study. The study protocol confirmed to the ethical

guidelines of the 1975 declaration of Helsinki, and ethical clearance was obtained from institutional ethical committee before commencing the study.

Data were collected regarding the patient's age, level of haemoglobin, random blood sugar, blood group, most common presenting complaint, total number of drugs prescribed, various classes of drugs prescribed, percentage of individual drugs in each class, percentage of parenteral versus oral drugs and percentage of drugs prescribed by their dosage forms were analysed. For the purpose of calculation, fixed dose combinations were considered as one single drug.

For measuring the tendency of prescribing by generic name, we have analysed the percentage of drugs prescribed by generic name which is calculated by dividing the number of drugs prescribed by generic name by total number of drugs prescribed, multiplied by 100. To measure the degree to which the prescribing practices conform to our national drug policy, we have also analysed the percentage of drugs prescribed from the national list of essential medicines (NLEM) of India. Percentage is calculated by dividing number of products prescribed which are in essential drug list of India by the total number of drugs prescribed, multiplied by 100. Statistical analysis was primarily descriptive with values mainly expressed as percentages.

## RESULTS

The average age of patients was 42.56±11.23 years. The average haemoglobin level was 9.63±2.11 gm/dl and the average random blood sugar level was found to be 103.84±29.77 mg/dl. There were 39 patients with A+ blood group, 56 patients with B+ group, 46 patients with O+ blood group and 9 patients had AB+ blood group (Table 1). Most common presenting complaint was vaginal discharge followed by dysmenorrhea and dysfunctional uterine bleeding.

**Table 1: Demographic profile of In-patients of gynaecology department.**

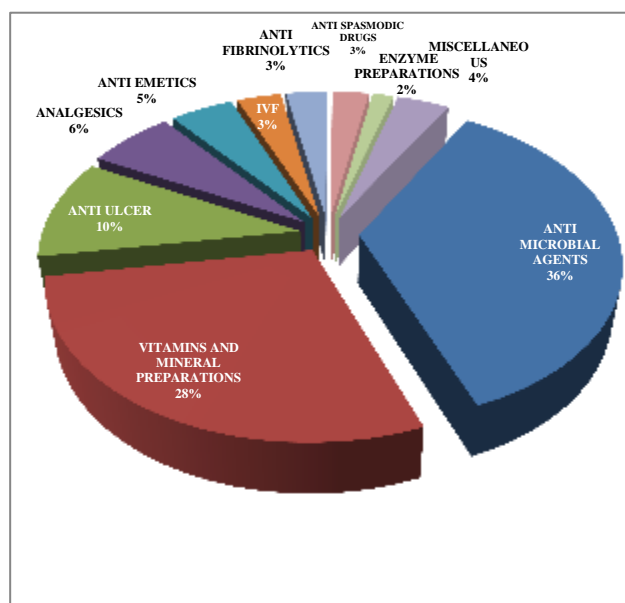
Parameter	Mean	SD
Age	42.55698 years	11.23056
Haemoglobin	9.631544 gm/dl	2.109377
Random blood sugar	103.8378 gm/dl	29.77379
Blood group	A+ : 39	24.07 %
	B+ : 61	37.65 %
	O+ : 47	29.01 %
	AB : 15	09.26%
<b>Total : 162</b>		

Overall a total of 1647 drugs were prescribed to 162 patients. With regard to various classes of drugs that were prescribed, Antimicrobials agents were the most common drugs (n=589; 35.76%) (Table 2 and Figure 1). Among them, metronidazole either given orally (17.66%) or

parenterally (9.68%) was the most commonly used antimicrobial followed by doxycycline (15.45%) which was followed by tetanus toxoid (13.92%) while lincomycin (0.34%) was the least used drug among the prescribed antimicrobials (Figure 2).

**Table 2: Category wise drug prescription among in-patients of gynaecology department.**

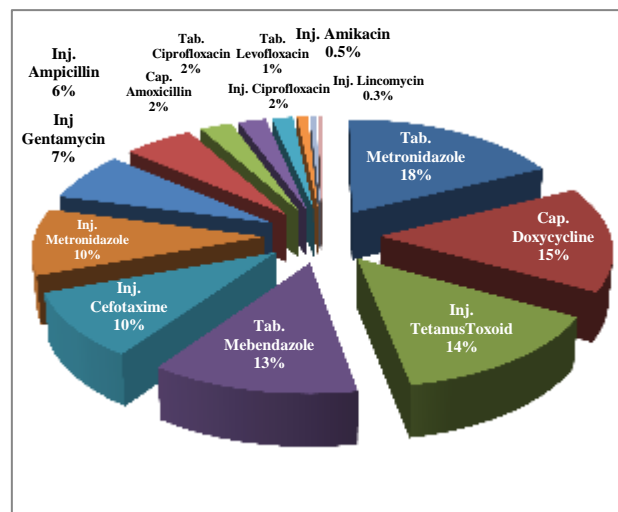
Drug category	Number	Percentage (%)
Anti-microbial agents	589	35.76
Vitamins and mineral preparations	466	28.29
Anti-ulcer drugs	170	10.32
Analgesics	105	6.38
Anti-emetics	77	4.67
IVF	54	3.27
Anti-fibrinolytic drugs	51	3.10
Anti-spasmodic drugs	45	2.73
Enzyme preparations	26	1.58
<b>Miscellaneous</b>		
sedatives	16	0.97
Hormonal preparations	12	0.73
Anti-hypertensive drugs	10	0.61
Antiseptic drugs	09	0.55
Anti-diabetic drugs	06	0.36
Anti-thyroid drugs	05	0.30
Anti-histaminics	04	0.24
Laxatives	02	0.12
<b>Total</b>	<b>1647</b>	<b>100</b>



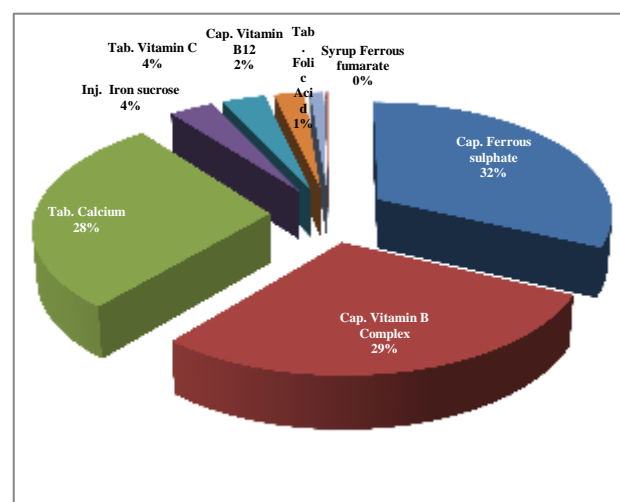
**Figure 1: Category wise drug prescription among in-patients of gynaecology department.**

The second most commonly prescribed group of drugs were vitamin and mineral preparations (n=466; 28.29%) out of which ferrous sulphate (31.97%) was the most commonly prescribed drug followed closely by vitamin B

complex (29.18%) and calcium (28.33%) (Table 2 and Figure 3). Ferrous fumarate was the least commonly prescribed drug in this category.



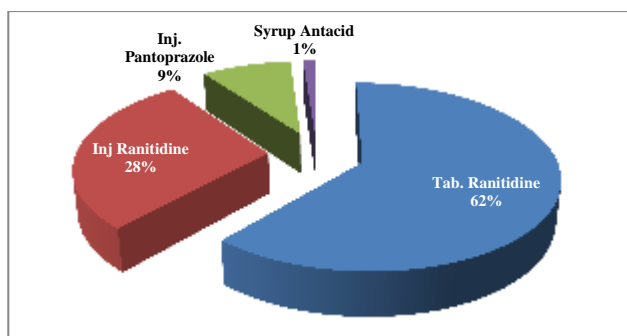
**Figure 2: Prescription of anti-microbial agents among in-patients of gynaecology department.**



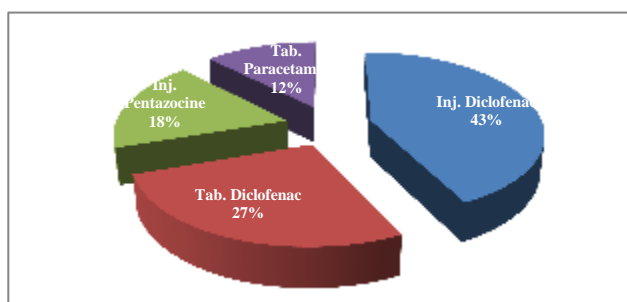
**Figure 3: Prescription of vitamins and mineral preparations among in-patients of gynaecology department.**

The third most prescribed drugs were anti-ulcer drugs (n=170; 10.32%) among which ranitidine whether given orally ( 61.18%) or parenterally (28.24%) was the most commonly prescribed followed by the proton pump inhibitor, pantoprazole (8.82%) while esomeprazole (0.59%) was the least commonly prescribed anti-ulcer drug (Table 2 and Figure 4).

Among the analgesics (n=105; 6.38%) diclofenac whether given parenterally (36.19%) or orally (22.86%) was the most commonly prescribed drug followed by the opioid drug, pentazocine (15.24%). Mephenamic acid (4.76%) was the least prescribed drugs in this category (Table 2 and Figure 5).

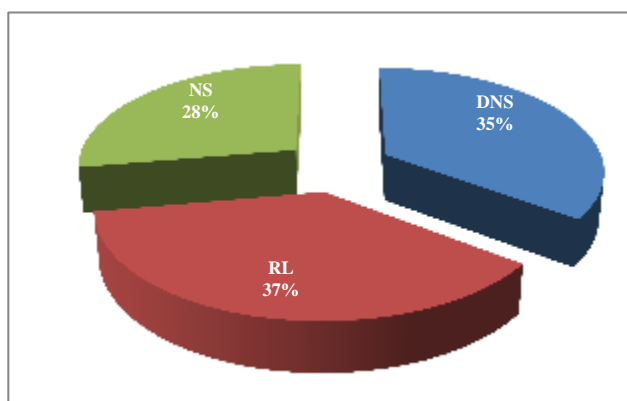


**Figure 4: Prescription of anti-ulcer drugs among in-patients of gynaecology department.**



**Figure 5: Prescription of analgesics among in-patients of gynaecology department**

Among the anti-emetics (n= 77; 4.67%) that were prescribed to gynaecology patients ondansetron (77.92%) was most commonly prescribed followed by promethazine (22.08%) (Table 2). Among the Intravenous fluids (n=54; 3.27%), ringer lactate (37.03%) was the most commonly prescribed which was closely followed by dextrose normal saline (35.19%) and later by normal saline (27.78%) (Table 2 and Figure 6).

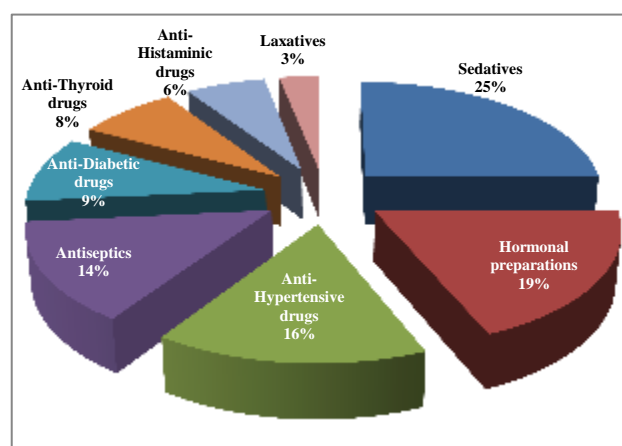


**Figure 6: Prescription of intravenous fluids among in-patients of gynaecology department.**

The next group of drugs were anti-fibrinolytic (n=51; 3.10%), in which tranexamic acid either given parenterally (56.86%) or orally (43.14%) was the only drug prescribed. As far as anti-spasmodics (n=45; 2.73%) are concerned, dicyclomine either given orally (73.33%) or

parenterally (26.67%) was the only drug prescribed. Among the enzyme preparations (n=26; 1.58%), the fixed dose combination of chymotrypsin with trypsin (87.5%) which is used to resolve inflammation, reduce oedema and hasten healing of wound was the most prescribed drug and syrup fungal diastase (12.5%) used for improving the digestion was the least prescribed (Table 2 and Figure 1).

Miscellaneous drugs include sedatives like diazepam (n=16; 0.97%), hormonal preparations like medroxy progesterone acetate (n=12; 0.73%), anti-hypertensive drugs (n=10; 0.16%) the most commonly prescribed being losartan (n=4; 40%), antiseptics like betadine pessaries (n=9; 0.55%), anti-diabetic drug metformin (n=6; 0.36%), anti-thyroid drug carbimazole (n=5; 0.30%), anti-histaminic drug cetirizine (n=4; 0.24%) and laxative like lactulose (n=2; 0.12%) (Table 2 and Figure 7).



**Figure 7: Prescription of miscellaneous drugs among in-patients of gynaecology department**

**Table 3: Prescription of drugs according to the dosage forms among in-patients of gynaecology department.**

Dosage form	Number	Percentage (%)
Tablets	626	38.01
Injections	548	33.27
Capsules	402	24.41
Infusions	54	3.28
Pessaries	09	0.55
Syrups	08	0.49
<b>Total</b>	<b>1647</b>	<b>100</b>

Table 3 depicts various dosage forms of the drugs that were prescribed in this study which clearly shows that the top three dosage forms were tablets (n=626; 38.01%) followed by injections (n=548; 33.27%) which were followed by capsules (n=402; 24.41%). The least prescribed dosage form was as syrup (n=8; 0.49%). In our study, the percentage of drugs prescribed by generic name was found to be 26.17% and the percentage of drugs prescribed from NLEM was found to be 84.86%.



## DISCUSSION

Although, there were few studies done in India which analysed the pattern of drug use in patients of gynaecology department, an overwhelming majority of them were carried in patients of out-patient department basis. The present study is first of its kind as we have done a comprehensive analysis of drugs used in inpatients of gynaecology department in a teaching hospital situated in rural area.

In our study, the mean age of presentation was  $42.56 \pm 11.23$  years and the most common age group was 40-50 years. This is in contrast to the other studies where the mean age of presentation was 29.80 years.<sup>15,16</sup> This might be because majority of the patients in our study are from rural background and those studies were done in urban areas. As most of the females from this region are uneducated, their awareness to the diseases is less and so there is a delay in contacting the health care facility.

In our study, the most common presenting complaint was vaginal discharge which is falling in line with the previous statistics as it is the most common symptom of reproductive tract infections (RTI).<sup>17,18</sup> RTIs are the major cause of gynaecological morbidity all over the world.<sup>9</sup> NFHS-3, estimates that 11.1% of women were reported to have RTI in India. Overall, antimicrobials were the most commonly prescribed drugs in our study which was obvious as RTI's are one of the most common ailments in gynaecology department. This is in agreement with other previous studies done by Shah BK et al and Shivong A et al.<sup>19,20</sup> According to Patel SV et al, pelvic inflammatory disease (PID) is one of the most serious infections and is a common problem encountered in gynaecological clinics in India and abroad.<sup>21</sup>

Among antimicrobials, metronidazole was the most commonly prescribed drug in our study. This is in agreement with previous studies as most of the gynaecological infections are anaerobic in nature and metronidazole being the drug of choice for anaerobic organisms.<sup>22</sup> Use of routine antimicrobials commonly available indicates better trend as metronidazole and doxycycline are economical and effective drugs.<sup>23,24</sup> But caution must be exercised while prescribing antimicrobials as their empiric or unnecessary use could facilitate emergence of resistance and escalate the cost of treatment.

Vitamin and mineral supplements were the second most common category of drugs in our study. The mean hemoglobin in our study was  $9.63 \pm 2.10$  which shows that most of the women were anaemic. As per Bhatia et al approximately one-third of all women in OPD reported symptoms of anemia.<sup>25</sup> This explains why a large number of vitamin and mineral preparations were haematinics (42.49%) which are employed to correct the anaemia.

Analgesics were the third most commonly prescribed drugs which can be explained as dysmenorrhoea was a common presenting complaint in ours. Even

antispasmodics have been substantially prescribed in our study which was primarily used for relieving dysmenorrhoea. In our study diclofenac was the most commonly prescribed but in a study done by Baig et al, it was found that ibuprofen was the most common drug prescribed among analgesics.<sup>26</sup>

As far as dosage forms are concerned, oral dosage forms like tablets and capsules were the highest (64.16) which was comparable to a previous study done by Darji NH et al where the percentage of oral dosage forms was found to be 69.54%.<sup>27</sup> The ideal percentage of injections according to WHO must be between 13.4% to 24.1% but in our study it was found to be slightly higher 33.27% as our hospital was located in a rural part where the patients believe that always injection will be better than a tablet or capsule for any disease. Use of more number of injectable drugs was observed by Patel et al while some studies by Rehan et al reported use of less number of injectable drugs by interns in north India.<sup>5,28</sup>

The percentage of drugs prescribed by generic name was found to be less in our study (26.17%). There is no uniform report regarding 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.<sup>29,30</sup> Use of branded drugs imposes economic burden on the patients. The percentage of drugs prescribed from NLEM was found to be 84.86% which indicates a better trend of prescribing as these drugs are safer, efficacious and comparatively economical to the patients. As most of the patients in our study are from the rural background, their affordability is very less and

In conclusion, antimicrobial agents, vitamin and mineral preparations and anti-ulcer drugs were the top three categories of drugs prescribed in our study. Metronidazole was the most commonly prescribed antimicrobial drug whereas ferrous sulphate was the highest prescribed vitamin and mineral preparation. Use of cheap and easily available drugs like metronidazole and doxycycline indicates a good practice especially in this rural setting. Among the anti-ulcer drugs, ranitidine was the most frequently prescribed drug. Most commonly used analgesic was diclofenac, antiemetic was ondansetron and IV fluid was ringer lactate. Usage of injections should be reduced as they were relatively more commonly prescribed in our study. Prescription of drugs by generic names must be increased substantially to reduce the economic burden on patients.

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