

## **Drug utilization study in genitourinary infections used as a teaching tool for rational therapy for MBBS students in a Medical College at Dehradun, Uttarakhand**

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### **ABSTRACT**

**Background:** There is a need to introduce clinical pharmacology at the undergraduate level in order to improve rational prescribing of medicines. The present study was undertaken to analyze drug utilization pattern of genitourinary infections to teach certain basic skills to MBBS students which will form an integral component of practicing rational therapeutics.

**Methods:** The retrospective study was conducted by Pharmacology Department in Shri Guru Ram Rai Institute of Medical and Health Sciences (SGRRIM and HS). A total of 92 prescriptions were collected by second professional MBBS students and randomly evaluated for prescribing pattern using WHO drug indicators.

**Results:** A total of 92 prescriptions were analyzed. Male:female ratio was 1.96:1. Age wise distribution was done: 0-15 years were 14 (15.21%), 16-30 years were 26 (28.26%), 31-45 years were 24 (26.08%), 46-60 years were 19 (20.65%), and >60 years were 9 (9.78%). A total of 260 drugs were prescribed. 116 (44.61%) antimicrobials, 70 (26.92%) antacids and antiemetics, 40 (15.38%) analgesics, 11 (4.23%) urinary alkalizers, 9 (3.23%) antifibrinolytics, and 14 (5.38%) miscellaneous drugs were prescribed. 144 (55.38%) injectable and 116 (44.61%) oral drugs were prescribed. Numbers of fixed-dose combinations were 32 (34.78%). 2.82 drugs per prescription were prescribed. 171 (65.76%) drugs were prescribed from National List of Essential Medicines 2013 (NLEM 2013). Majority of drugs were prescribed by brand names.

**Conclusion:** Majority of drugs were prescribed from NLEM 2013. The main purpose of undergraduate medical curriculum is to develop the requisite diagnostic and therapeutic skills of a basic doctor. It is only by drug utilization studies that burden of diseases and corresponding utilization of drugs can be measured.

**Keywords:** Genitourinary infections, Fixed dose combinations, Drug utilization studies

### **INTRODUCTION**

The WHO sponsored survey on teaching clinical pharmacology in medical colleges in India has shown that there is a need to introduce clinical pharmacology at the undergraduate level in order to improve rational prescribing of medicines. The broad goal of teaching undergraduates clinical pharmacology is to impart the knowledge, skills, and attitudes that a student should learn in order to prescribe drugs safely and effectively and to maintain this competence throughout his/her professional life.<sup>1</sup> The principle target of the drug utilization studies/research is to promote the rational prescribing of the drugs. Without proper knowledge of drug prescribing pattern, it is impossible to suggest

measures to improve the prescribing attitude of prescribers.<sup>2</sup> Genitourinary infections are a serious health problem affecting millions of patients, each year around the world. These infections occur in all populations and ages; however, most commonly in sexually active women.<sup>3</sup>

In order to impart clinical pharmacology knowledge to the MBBS second professional students and to improve quality of the students by having adequate knowledge in rational prescribing, a drug utilization study in genitourinary infections was conducted by the Department of Pharmacology in the Hospital ward at Shri Guru Ram Rai Institute of Medical and Health Sciences (SGRRIM and HS), Dehradun.

**METHODS**

This retrospective study was conducted by Pharmacology Department in SGRRIM & HS, Dehradun. A total of 92 prescriptions were collected by second professional MBBS students during their 5th semester and randomly evaluated for prescribing pattern in genitourinary infections by using WHO drug use indicators. The prescription data were taken by second professional MBBS students for a period of 1 year from January 2011 to December 2011. It was discussed and analyzed in the Department of Pharmacology for trends of drugs use and rationality of prescriptions in genitourinary infections. The WHO indicators which were analyzed were: drug formulations, fixed-dose combinations, drugs prescribed from National List of Essential Medicines (NLEM 2013), generic drugs, and drugs prescribed per prescription.

**RESULTS**

A total of 92 prescriptions were collected by MBBS second professional students; Male:female % age was 61 (66.3%), 31 (33.69%). Age wise distribution of patients was done, 0-15 years 14 (15.2%), 16-30 years 26 (28.3%), 31-45 years 24 (26%), 46-60 years 19 (20.6%), and >60 years 9 (9.78%) patients (Table 1). A total of 260 drugs were prescribed during the study period. 116 (44.61%) antimicrobials, 70 (26.92%) antacids and antiemetics 40 (15.38%) analgesics, 11 (4.23%) urinary alkalizers, 9 (3.23%) antifibrinolytics, and 14 (5.38%) miscellaneous drugs were prescribed (Figure 1). Among antimicrobials, ceftriaxone was most commonly prescribed in 23 (19.82%) patients, followed by ciprofloxacin in 19 (16.37%), amikacin in

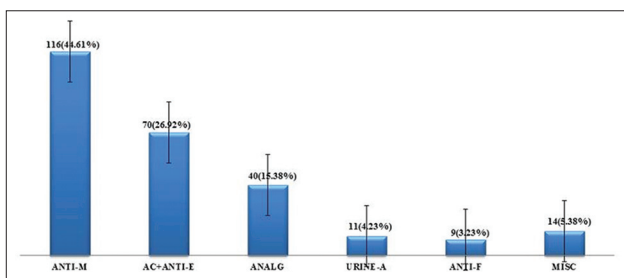
17 (14.65%), ofloxacin in 14 (12.06%), gentamycin in 13 (11.20%), nitrofurantoin in 10 (8.62%), metronidazole in 9 (7.75%) patients, and 11 (9.48%) from miscellaneous category were prescribed (Figure 2). 144 (55.38%) injectable and 116 (44.61%) oral drugs were prescribed. A total of 32 (12.30%) fixed dose combinations were prescribed (Figure 3). The drugs prescribed per prescription were 2.82 (Figure 3). 171 (65.76%) drugs were prescribed from NLEM 2013 which included ceftriaxone 23 (13.45%), omeprazole 20 (11.69%), ciprofloxacin 19 (11.11%), domperidone 18 (10.52%), amikacin 17 (9.94%), ofloxacin 14 (8.18%), gentamicin 13 (7.60%), diclofenac sodium 12 (7.01%), nitrofurantoin 10 (5.84%), metronidazole 9 (5.26%), multivitamins 7 (4.09%), cefotaxime 3 (1.73%), pantoprazole 2 (1.16%), amoxicillin + clavulanic acid 2 (1.16%) and sulfamethoxazole + trimethoprim 2 (1.16%) (Figure 4). 89.53% drugs were prescribed by their respective brand names.

**DISCUSSION**

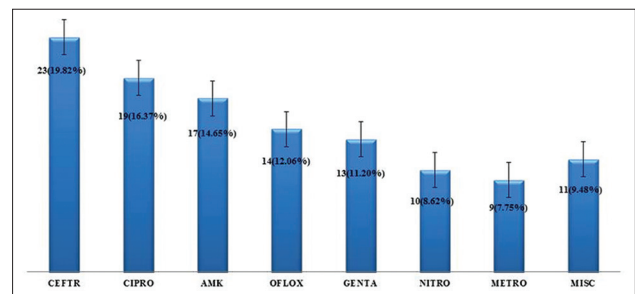
The present study was an attempt to develop clinical skills in MBBS second professional students and develop skills in rational prescribing. Prescribing is the act of determining which drug for which patient at an appropriate dosage regimen and with optimal duration of treatment. This is dynamic, highly individualized and involved medical, social,

**Table 1: Demographic profile.**

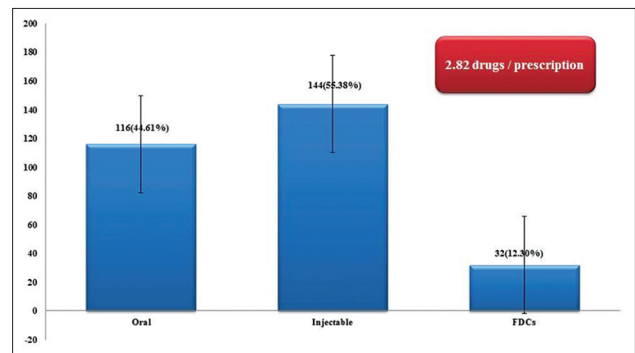
Total patients	92
Male:female	61 (66.3%), 31 (33.69%)
0-15 years	14 (15.2%)
16-30 years	26 (28.3%)
31-45 years	24 (26%)
46-60 years	19 (20.6%)
>60 years	9 (9.78%)



**Figure 1: Drugs prescribed. ANTI-M: Antimicrobials, AC+ANTI-E: Antacids and antiemetics, ANALG: Analgesics, URINE-A: Urinary alkalizers, ANTI-F: Antifibrinolytics, MISC: Miscellaneous drugs.**



**Figure 2: Antimicrobials prescribed. CEFTR: Ceftriaxone, CIPRO: Ciprofloxacin, AMK: Amikacin, OFLOX: Ofloxacin, GENTA: Gentamicin, NITRO: Nitrofurantoin, Metro: Metronidazole, MISC: Miscellaneous.**



**Figure 3: Drug formulation and drugs/prescription. FDCs: Fixed dose combinations.**

and marketing forces. Inappropriate prescribing including supraoptimal or suboptimal choice of medication, higher or lower drug dosage, inappropriate duration, therapeutic duplication, potentially dangerous drug-drug interaction, prescribe an expensive drug when a cheaper and equally effective agent is available, are important health care problems.<sup>4</sup> Prescription monitoring studies are important for obtaining data about the patterns and quality of use, the determinants of drug use, and the outcomes of use. The WHO drug use indicators are highly standardized and are recommended for inclusion in drug utilization studies.<sup>5,6</sup> In this study, students learnt about the demographic profile of patients i.e. number of male and female patients, age wise distribution of diseases. The present study showed more number of genitourinary infections in males as compared to females. This was comparable with the previous study by Muraraiah et al.<sup>7</sup> and in contrast to studies by Prakasam et al. and Akter et al., where females were more commonly affected.<sup>8,9</sup> Most of the patients were in 16-30 years age group in the present study. This was comparable with the previous study by Akter et al.<sup>9</sup> The present study was aimed to teach the importance of pharmacotherapy and rational use of drugs to undergraduate students as explained in previous studies.<sup>10</sup> Students were able to categorize the drugs as antibiotics, antacids, antiemetics, analgesics, urinary alkalizers, and other drugs. Thus, they developed analytical skills and understood the prescribing trends in genitourinary tract infections in the hospital. Antibiotics were the most frequently prescribed medicines in the present study. This was comparable with the previous study by Loeb et al.<sup>11</sup> Antibiotic treatment is recommended by primary care guidelines as it is effective for fast symptom resolution.<sup>12,13</sup> Most commonly prescribed antimicrobial in the present study was ceftriaxone which was comparable with previous study

by Ramanath and Shafiya<sup>14</sup> This was followed by the use of ciprofloxacin which was the most commonly prescribed antimicrobial in a study by Bleidorn et al.<sup>15</sup> Amikacin was the third most frequently prescribed antibiotic in our study. The choice of antimicrobial is dependent on a local situation with regard to antibiotic resistance of the pathogenic bacteria.<sup>16</sup> The importance of fixed-dose combination was also imparted to the undergraduate students. The drugs prescribed per prescription in the present study were less as compared to the previous study.<sup>7</sup> Majority of the drugs were prescribed from NLEM, which was also comparable with the previous study by Muraraiah et al. The use of generic medicines was less in the present study which was similar to the previous study.<sup>7</sup> Although, most of the drugs prescribed were from essential drug list, prescribing by generic name needs to be improved in our hospital to prevent medication errors and further adverse effects due to it. Limitations of this study were the inability on the part of students to report adverse drug reactions and various drug interactions.

The main purpose of undergraduate medical curriculum is to develop the requisite diagnostic and therapeutic skills of a basic doctor. The practical training has also to be need-based and relevant.<sup>17</sup> Mere theoretical teaching is not enough. The students must be taught certain basic skills which form an integral component of practicing rational therapeutics.<sup>18</sup>

## CONCLUSION

The present study revealed that genitourinary infection was more prevalent in males in the age group of 16-30 years. Antimicrobials were the most frequently prescribed drugs. Majority of drugs were prescribed from NLEM. Most of the drugs were prescribed by their respective brand names. Training of students through such drug utilization studies gives a clinical orientation to the MBBS students, which have a bearing on their further training in final professional and internship.

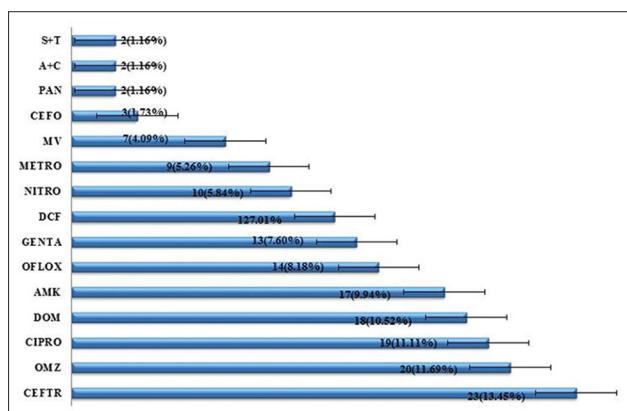
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**Figure 4: Drugs prescribed from National List of Essential Medicines 2013. CEFTR: Ceftriaxone, OMZ: Omeprazole, CIPRO: Ciprofloxacin, DOM: Domperidone, AMK: Amikacin, OFLOX: Ofloxacin, GENTA: Gentamicin, DCF: Diclofenac sodium, NITRO: Nitrofurantoin, Metro: Metronidazole, MV: Multivitamins, CEFO: Cefotaxime, PAN: Pantoprazole, A+C; Amoxicillin+Clavulanic acid, S+T: Sulfamethoxazole+Trimethoprim.**

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