Prescribing Pattern of Antimicrobial Agents in Patients with Pelvic Inflammatory Disease in a Tertiary Care Hospital at Rural Part of Western Nepal

Neupane GP[1], Rai M[2], Gurung S[3], Pandeya DR[4]

ABSTRACT

Introduction: Antibiotics are the most frequently prescribed drugs in patients with Pelvic Inflammatory Diseases. Appropriate antibiotic prescriptions in health care institutions are an important element in quality of care, infection management and cost control. **Aims:** To analyze prescription pattern of antimicrobial agents in patients with pelvic inflammatory diseases. **Methods**: This quantitative cross-sectional study was conducted including 300 patients' prescriptions, at Karnali Academy of Health Sciences Jumla Nepal for period of six months during August 2021 to January 2022. This study was based on medication utilization form, which was designed on basis of World Health Organization core drug use indicator format. **Results:** Females were in ages from 12 to 69 years, with mean of 30.46 ± 18.71 years. Chronic Pelvic inflammatory Disease was most prevalent in 20–29 age group (47%) while, lowest in 60–69 age group (1.67%). The total number of prescribed drugs was 796 averaging 2.65 drugs per prescription. The most commonly prescribed antimicrobials were azithromycin (30.15%), tinidazoles (25.25%) and ofloxacin (8.16%). Only 15.5% of drugs were prescribed with generic names and all were from essential list of medicines. 92.8% of prescriptions were administered orally, while 7.8% parenteral. However 76.34% of prescriptions were considered irrational. **Conclusion**: The high prevalence of irrational prescriptions suggests need for interventions to improve healthcare provider's adherence to established treatment guidelines. Dominance of specific drug classes underscores importance of tailoring treatments to the specific pathogens involved in Pelvic Inflammatory Disease. Suggesting potential room for improvement inadherence to evidence-based guidelines.

Keywords: Antibiotic, Pelvic Inflammatory Disease, Prescriptions, Women

Authors:

1. Dr. Ganesh Prasad Neupane
2. Dr. Maya Rai
3. Dr. Sonam Gurung
4. Dr. Dipendra Raj Pandeya

[1]Department of Pharmacology, System and Disease (Preclinical Sciences) Medical University of the Americas, Nevis

[2]Associate Professor, Department of Microbiology, Karnali Academy of Health Sciences Jumla, Nepal

[3]Lecturer, Department of Gynecology and Obstetrics, Karnali Academy of Health Sciences Jumla, Nepal

[4]Associate Professor Department of Human and Molecular Genetics, Herbert Wertheim College of Medicine, Miami, FL

Address for Correspondence:

Dr. Ganesh Prasad Neupane
Associate Professor
Department of Pharmacology System and Disease (Preclinical Sciences)
Medical University of the Americas, Nevis
Email: ganeshpn2003@yahoo.com

INTRODUCTION

A clinical syndrome of the female reproductive system called pelvic inflammatory disease (PID) is characterized by endometrial, fallopian tube, or peritoneal inflammation. These infections come at a high cost to women because they can result in long-term complications like tubal infertility, persistent pelvic pain, and abortions if left untreated.[1] According to CDC recommendations, the treatment plan for pelvic inflammatory disease should include broad spectrum Antimicrobial agents (AMAs) coverage of likely pathogens.[2] The most frequently prescribed medications for PIDs are antibiotics. Programs aimed at promoting appropriate antibiotic prescriptions in healthcare facilities are crucial for improving care quality, preventing infections, and controlling costs.[3] A potential pharmacovigilance tool that enables healthcare professionals to audit prescribing practices and suggest changes to prevent indiscriminate prescribing and the emergence of microbial resistance is the study of antimicrobial agent prescribing patterns.[4] The ability to prescribe medications is crucial because it shows a doctor's understanding of pharmacology and pathophysiology as well as their diagnostic prowess and outlook on choosing the best course of action.[5] The polypharmacy, frequent use of antibiotics, insufficient dosage, excessive use of injections, failure to prescribe in accordance with clinical guidelines, prescribing by brand names, and inappropriate self-medication are common examples of

irrational medication use which increase the chance of drug resistance.[6] The data of antimicrobial usage in PID patients, is relatively scarce from a developing country like Nepal especially from the rural part of our country. Hence, this cross sectional study was undertaken to understand the pattern of antibiotics usage among PID patients in rural teaching hospital of Nepal and to evaluate the compliance of usage with respect to standard treatment recommendation.

METHODS

This quantitative cross-sectional study was conducted at the Karnali Academy of Health Sciences (KAHS) in Jumla, Nepal, for a period of six months from August 2021 to January 2022. The study was approved by the Institutional review ethical Committee of KAHS Jumla. The study was conducted on clinically diagnosed (both acute and chronic) PID patients. Three hundred (300) women suffering from pelvic inflammatory disease attending the Obs/Gynecology department of Karnali Academy of Health Sciences, teaching Hospital, Jumla were enrolled. The diagnosed cases of pelvic inflammatory diseases, pregnant, non-pregnant, lactating, women with a first attack of PID, who visited the outpatient department of gynecology and were prescribed at least one antibiotic were included in the study. Those with recurrent attacks or those previously on an antibiotic(s) related to PID, Patients suffering from hepatitis B and HIV were excluded. Data was collected after visiting the outpatient Gynecology department thrice weekly. The records of patient profile (age, patient address, marital status, pregnancy status, education, work profile, menstruation cycle, and hygiene measure) types of genitourinary tract infection drugs prescribed (Types of antibiotics, routes of administration, generic/brand name, clinical features and treatment instructions were noted in 'working proforma' after getting explained written consent from the patients.

The Data was entered in Microsoft Excel 2010 sheets and analyzed using SPSS 20.0. Descriptive statistics tools were used to describe the data. Mean was used as a measure of central tendency and Standard deviation was performed to understand the dispersion of data. The prescription was considered rational if the antimicrobial use and its route of administration, dose, frequency, and duration of use were considered appropriate for PID. This study was based on the medication utilization form, which was designed based on a WHO core drug use indicator format.[6]

RESULTS

A total of 300 prescriptions were analyzed during the 6 months study period. Age of the females ranged from 12 to 69 years. The mean age of the patients with PID was 30.46 ± 18.71 years. The maximum numbers of female patients suffering from Chronic PID were from the age group of 20-29 years 47% (n=141), and least of the patients were under age group of 60-69 yrs. 1.67%. (Table I).

Age groups in year	Total Number of female patients	Percentage
10-19	17	5.67
20-29	141	47
30-39	118	39.33
40-49	12	4
50-59	7	2.33
60-69	5	1.67
Total	**300**	**100**

Table I: Age wise distribution of PID patient n=300

During the study, it was observed that the most commonly prescribed antimicrobial agents were Azithromycin (30.15%), Tinidazoles (25.25 %), and Ofloxacin (8.16%). (Table II)

Class of Drug	Antimicrobial agents	No. of agents prescribed	Consumption (%)
Macrolide	Azithromycin	240	30.15
Tetracycline's	Doxycycline	60	7.53
Fluoroquinolones	Ofloxacin	65	8.16
	Ciprofloxacin	14	1.75
	Norfloxacin	9	1.13
Nitroimidazole	Tinidazole	201	25.25
	Metronidazole	53	6.70
	Ornidazole	11	1.38
Cephalosporin	Caphadroxil	19	2.38
	Cefixime	50	6.28
Azoles antifungals	Clotrimazole	56	7.03
	Fluconazole	18	2.26
Total		**796**	**100**

Table II: Commonly prescribed antimicrobial agents

The total number of drugs which were prescribed to the patient was 796. Each patient on average was prescribed 2.65 drugs per prescription. Only 15.5% of the drugs were prescribed by generic names, and 76.34% of the prescriptions were irrational. Most of the prescriptions (92.8%) of the drugs were administered by oral routes. Table III

S. No.	Indicators	
1.	Total number of Prescriptions	300
2.	Total number of anti-microbial agents prescribed	796
3.	Average number of anti-microbial agents per prescription	2.65
4.	Percentage of drugs prescribed by generic names	15.5%
5.	Percentage of drugs from Essential list of medicine	100%

6.	Percentage of drugs by oral route of administration	92.8%
7.	Percentage of drugs by parenteral route of administration	7.8%
8.	Percentage of rationale prescriptions	23.66%
9.	Percentage of irrational prescription	76.34%

Table III: Prevalence of Drug Use Indicators

DISCUSSION

Regulating standards and assessing the quality of care through performance review should become part of everyday clinical practice. Senseless utilization of anti-microbial agents has additionally offered to ascend to an expanded danger of reactions, antimicrobial resistance, high expenses, and impacts requiring revitalizing consideration.[7] The study involved the analysis of 300 prescriptions, shedding light on various aspects such as patient demographics, drug utilization, prescription patterns, and drug classification. The study samples comprised female patients aged between 12 and 69 years with an age of 30.46± 18.71 years. The age distribution of patients revealed that the majority fell within the age range of 20-29 years, constituting 47% of the total patient population. Interestingly, patients aged 60-69 years constituted the smallest portion, at only 1.67 %, which was similar to the findings of Sharma S, et al[8] mean age 31.68 years in North India and Anyalechi GE et al[9] in USA in the age group of 18-29 years. This distribution suggests that PID primarily affects women in their reproductive years, aligning with the understanding of PID's association with sexually transmitted diseases.[10] Older women do not usually have risk factors, which can expose them to sexually transmitted microorganisms. With advancing age there are behavioural, physiologic and anatomic alterations that offer barriers to the usual means of developing PID.[11]

Each prescription contained an average of 2.65 drugs. This metric indicates the complexity of treatment regimens for PID patients, possibly due to the need to address various symptoms and complications associated with the condition. In the study of Gupta D et al[7], the average number of drugs per prescription was 2.26 and in the study of Sharma S. et al[8] it was 2.52. The variation in the number of prescriptions may be because of variations in incidences of infection which may be partly due to variations in behavioural, demographic, socioeconomic, and health characteristics of the population in different areas.[12]

The most commonly prescribed antimicrobial agents were Azithromycin (30.15%), Tinidazoles (25.25%), and ofloxacin (8.16%). However, in the study of Paulose A et al[13] nitroimidazoles, and cephalosporin, were most commonly prescribed, in the study of Gupta D et al.[7] The most commonly prescribed Antimicrobial agents were Antifungals followed by Fluoroquinolones, Aminoglycosides, Nitroimidazoles, and Doxycyclines. The variation in choosing antimicrobial agents might be based on their efficacy against the causative agents of PID, which often include sexually transmitted pathogens.[14] The distribution of drugs based on their classes reveals a diverse approach to treating PID. Antimicrobial agents, particularly from classes such as macrolides, tetracyclines, fluoroquinolones, and nitroimidazoles were prominent. These classes encompass antibiotics with a broad spectrum of activity, addressing different pathogens that could contribute to PID. Additionally, the use of azole antifungals like clotrimazole and fluconazole might be attributed to addressing potential fungal infections in PID patients.[15]

According to the CDC'2010 guidelines; regimens should contain adequate coverage against N. gonorrhoeae and C. trachomatis for acute PID. Anaerobic bacteria have been isolated (13- 78) % from the upper genital tract of women with acute PID.[16] Based on our findings we may conclude that antimicrobials' prescribing practice in our study is partially compliant to the suggested regimen in CDC'2010.

Only 15.5% of drugs were prescribed using generic names however, in the study of Gupta D et al[7] no antimicrobial agents were prescribed by generic name. The very low rate of prescribing drugs by generic name may be influenced by physicians' personal attributes, the cost of the medicine and the pharmaceutical industries' marketing and promotion strategies.[17] This suggests room for improvement in encouraging healthcare providers to prescribe drugs using generic names, which can contribute to cost-effectiveness and reduce confusion.[18] All of the drugs prescribed were from the essential list of medicines, which implies that healthcare providers adhered to recommended medications for PID treatment.[19] The majority of drugs (92.8%) were administered orally. Indicating that oral medications are preferred for PID treatment. The remaining drugs (7.8%) were administered parenterally, highlighting a relatively minor role of injectable medications in PID management.[20]

In our study, 76.34% of prescriptions were considered irrational, in the study of Gupta D et al. 78 % of the prescription were irrational. In contrast to our study in the study of Divedi YK5, 74% of the prescriptions were rational. The results of our study suggest that there is a potential need for enhancing prescription practices to better adhere to evidence-based guidelines.[21]

CONCLUSION

The study's findings shed light on various aspects of prescription patterns and drug use in PID patients. The high prevalence of irrational prescriptions suggests a need for interventions to improve healthcare providers' adherence to established treatment guidelines. Additionally, the dominance of specific drug classes underscores the importance of tailoring treatments to the specific pathogens involved in PID, while also considering factors such as patient allergies and drug interactions. Overall, this study provides valuable insights that can contribute to optimizing the management of PID and improving patient outcomes.

LIMITATION

A limitation of our study was the small sample size was small.

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