

Evaluation of the Prescription Pattern of Drugs Used in Treatment of Pelvic Inflammatory Disease at a Tertiary Care Hospital in Pune: A Cross-sectional Study

ABHIJIT V TILAK¹, MEGHA S MAMULWAR², ZOHRA NEDA SHAIKH³, SHANTANU CHITALE⁴, AADIL SHAH⁵, SHRADDHA BAPAT⁶



ABSTRACT

Introduction: Pelvic Inflammatory Disease (PID) is an inflammation of female upper genital tract which includes inflammation of uterine endometrium, fallopian tubes, ovaries and peritoneum. PID, constitutes a major public health concern for women of reproductive age, potentially leading to significant sequelae impacting their fertility. PID is a frequent concern for younger women due to Sexually Transmitted Infections (STI) and often associated with sexually transmitted pathogens.

Aim: To evaluate the prescription pattern of drugs used in PID.

Materials and Methods: The present cross-sectional study was done in Outpatient and Inpatient Department facility (OPD and IPD) of Gynaecology and Obstetrics Department, of Dr. D Y Patil Medical College, Hospital and Research Centre, Pune, Maharashtra, India. Total 146 prescriptions were analysed in the study. Demographic factors, clinical symptoms, treatment facility and drug utilisation patterns among patients with PID were studied. The data was entered using Microsoft Excel. Statistical analysis of demographic characteristics and

drug utilisation pattern was studied using frequencies and percentages.

Results: The mean age of the study participants was 33.84 (7.10) years and 97.3% of patients were married. It was noted that the most common presenting complaint was per vaginal discharge and infertility was the least common symptom. It was observed that the metronidazole (79.4%) and doxycycline (78.1%) were commonly used for the treatment. The most commonly prescribed group of drugs is antibacterial drugs, followed by Non-steroidal Anti-inflammatory Drugs (NSAIDs) and antifungal agents.

Conclusion: The present study focused on understanding the drug prescription and trends with respect to PID patients. Women with PID reporting to this tertiary health care facility were mostly young adults (31 to 40 years). Metronidazole, doxycycline and Cefixime were the most frequently prescribed antimicrobials. Based on the findings of the study, it was concluded that the antibacterial drugs prescribed are adhering the treatment guidelines by Centres for Disease Control and Prevention and Indian Council of Medical Research guidelines.

Keywords: Drug prescriptions, Drug therapy, Drug utilisation

INTRODUCTION

The PID is an inflammation of female upper genital tract which includes inflammation of uterine endometrium, fallopian tubes, ovaries and peritoneum. This condition occurs as persistent infections with pathogenic microorganisms, migrate from the vagina or endocervix to upper genital tract [1,2]. The primary transmission routes are often direct; however, the other less frequent routes of transmission also exist. These include haematogenous spread and lymphatic spread (e.g., tuberculosis). PID, constitutes a major public health concern for women of reproductive age, potentially leading to significant sequelae impacting their fertility. PID is a frequent concern for younger women due to STIs it occurs much less often in women after menopause [1].

PID constitutes a well-defined clinical syndrome characterised by significant adverse sequelae on reproductive health of a patient, including increased risk of infertility, ectopic pregnancy, and chronic pelvic pain. Diagnosis of PID relies primarily on clinical criteria. Pelvic or lower abdominal pain and signs of cervical, uterine, or adnexal tenderness during physical examination being crucial for establishing the diagnosis [1,2]. PID is often associated with sexually transmitted pathogens, primarily *Neisseria gonorrhoeae* and *Chlamydia trachomatis*. However, endogenous microorganisms comprising the vaginal commensals which include anaerobes, *Gardnerella vaginalis* and few gram-negative bacteria's also have

been implicated in the PID aetiology. Additionally, Cytomegalovirus, *Mycoplasma hominis* and *Ureaplasma urealyticum* might also cause PID in some cases [2]. PID is usually a sexually transmitted disease however in around 15% of the cases it could be non-sexually transmitted [3].

PID manifests in a spectrum of clinical presentations, ranging from acute, chronic and subclinical forms, often leading to underdiagnosis. Many cases remain hidden in the community either because females take longer time to perceive it as pathological condition or presentation of PID varies from acute to chronic form and makes it difficult for diagnosis [1]. This under diagnosis allows the disease to progress, potentially resulting in significant complications such as chronic pelvic pain, ectopic pregnancy, and intra-abdominal infections and infertility [4]. PID is primarily diagnosed clinically. Radiological or invasive studies are done only when the diagnosis is uncertain only limited number of cases.

Unexplained pelvic pain along with the cervical motion tenderness, uterine or adnexal tenderness during a pelvic exam among sexually active women, or those with risk factors suggests PID. In such cases, early empirical antibiotic treatment is crucial [4]. As the antimicrobials are the main line of treatment, selection of antimicrobial is very important as unwarranted antibiotic utilisation poses a significant threat, potentially leading to the development of Antimicrobial Resistance (AMR) [5]. Global studies on antimicrobial

usage in PID patients are extensive, but data from developing countries like India remains limited [6].

Drug utilisation studies offer a valuable tool in this context. By meticulously analysing current treatment practices, these studies can provide crucial insights into the prescribing patterns of antibiotics for PID. This information serves as an early warning system, allowing healthcare professionals to identify and address instances if there is an irrational antibiotic use. This, in turn, facilitates the implementation of targeted interventions aimed at promoting the judicious use of antibiotics [7]. Hence, the present study was done to evaluate the prescription pattern of drugs used in PID.

MATERIALS AND METHODS

The present cross-sectional study was done in OPD and IPD of Gynaecology and Obstetrics Department, of DY Patil Medical College, Hospital and Research Centre, Pune, Maharashtra, India. Prescriptions of the patients who availed facility of Gynaecology and Obstetrics department (IPD and OPD) during the period 1st November 2022 to 31st October 2023 were obtained retrospectively. Data analysis was done after 31st October 2023 till 31st December 2023. Total 146 prescriptions were included in the study. All records available during the study period were included. Institutional ethics committee clearance was obtained in October 2022 which was before initiation of the study. (IESC/PGS/2022/199).

Inclusion criteria: Prescriptions of patients diagnosed with PID clinically or in whom diagnosis was confirmed by radiological investigations or invasive methods such as laparoscopy or histopathology.

Exclusion criteria: Patients with co-morbidities and pregnant females. Data regarding Sociodemographic characteristics, clinical parameters and drug utilisation pattern was studied from medical records of patients having PID.

STATISTICAL ANALYSIS

The data was entered using Microsoft Excel. Statistical analysis of demographic characteristics and drug utilisation pattern was studied using frequencies and percentages.

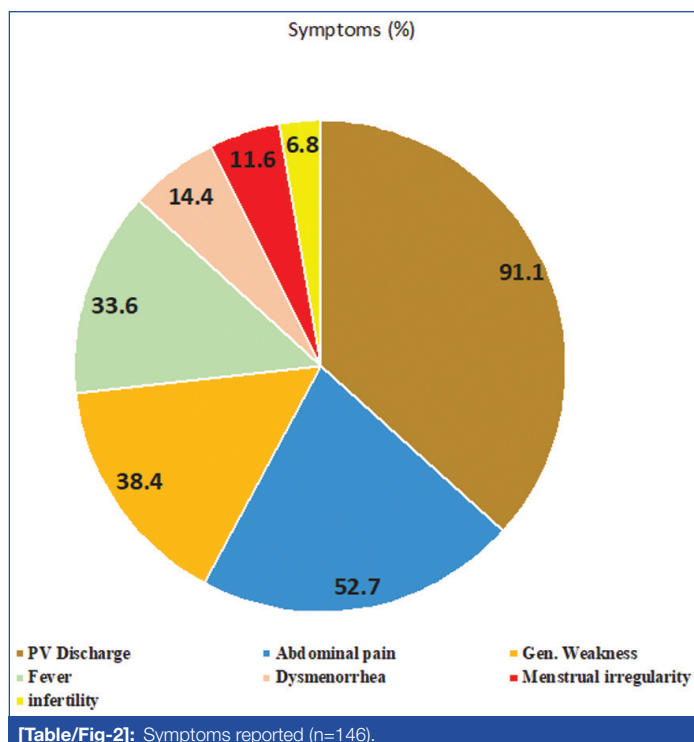
RESULTS

A total of 146 prescriptions were included in the current study. It was observed that 61(41.8%) cases were from age group between 31 to 40 years. However, only two cases were from above 50 age group. The mean (SD) age of the patients was 33.84 (7.10) years [Table/Fig-1]. It was observed in current study that the 97.3% of patients were married and 2.7% were unmarried [Table/Fig-1]. It was observed that the 80.8% of the cases have received treatment on OPD and only 19.2% required hospital admission [Table/Fig-1].

Parameters		Frequency (%)
Age (In years)	20-30	58 (39.7)
	31-40	61 (41.8)
	41-50	25 (17.1)
	>50	2 (1.4)
Marital status	Married	142 (97.3)
	Unmarried	4 (2.7)
Treatment facility	OPD	118 (80.8)
	IPD	28 (19.2)

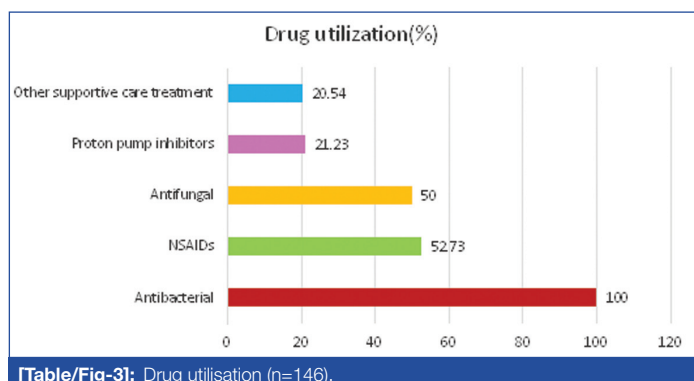
[Table/Fig-1]: Sociodemographic status and treatment facility details of cases. (n=146).

It was noted that the most common presenting complaint was per vaginal discharge and infertility was the least common symptom. Abdominal pain was reported by 52.7% of patients. Infertility was the least common symptom reported by 6.8% patients [Table/Fig-2].

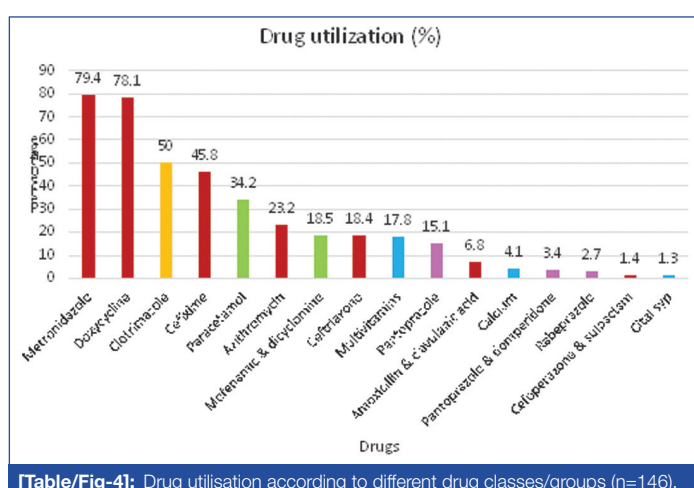


[Table/Fig-2]: Symptoms reported (n=146).

It was observed that the metronidazole (79.4%) and doxycycline (78.1%) were commonly used for the treatment. Followed by clotrimazole (50%) and cefixime (45.8%). Ceftriaxone was used in 18.4% of cases. Amoxicillin/clavulanate (6.8%) and cefoperazone/sulbactam (1.4%) were used less commonly as compared to other antimicrobial agents. Paracetamol was used in 34.2% of cases. Pantoprazole was prescribed in 15.1% of the cases [Table/Fig-3]. The most commonly prescribed group of drugs are antibacterial drugs, followed by NSAIDs and antifungal agents. Antibacterial drugs were used in all the 146 cases. Other supportive care treatment like multivitamins, calcium, cital syrup was given in 20.54% of patients [Table/Fig-4].



[Table/Fig-3]: Drug utilisation (n=146).



[Table/Fig-4]: Drug utilisation according to different drug classes/groups (n=146).

DISCUSSION

The PID represents a spectrum of ascending polymicrobial infections of the female upper genital tract. The endometrium, fallopian tubes, ovaries, and peritoneum can all be affected, often initiated by untreated bacterial vaginosis or STIs like *Chlamydia trachomatis* and *Neisseria gonorrhoeae* [1]. Diagnosis of PID remains challenging due to the absence of a specific gold standard test. Clinicians rely on a combination of clinical criteria, including pelvic pain, abnormal vaginal discharge, and cervical motion tenderness, to establish a diagnosis. This highlights the importance of maintaining a high index of suspicion for PID, particularly in young females with risk factors for STIs [1,2]. PID is a significant public health condition contributing to substantial gynaecological morbidity in women of reproductive age group [8]. The present study was done to describe the prescription patterns of drugs prescribed to patients diagnosed with PID from the Gynaecology and Obstetrics department.

It was observed that the mean (SD) age of the patients was 33.84 (7.10) years. This finding is similar to the studies conducted in northern India and Western Nepal [8,9]. However, in a study conducted in a Medical College Hospital, Telangana, India reported that the highest number of cases were from 26 to 30 years of age [10]. Overall, the occurrence of PID is common in reproductive age group.

It was noted that the 97.3% cases were married females. A study done in Jordan University hospital also reported that the 96.4% females were married [11]. Sexually active unmarried women, avoid visiting health care facilities for the fear of disclosure of their sexual status during testing for STIs. This could be the reason for occurrence a greater number of married females in the study population [12].

It was also noted that the 80.8% patients were treated at OPD. It indicates that the majority of the patients had mild to moderate infection as they did not need hospitalisation which is only needed in severely ill patients. The commonly reported symptoms were per vaginal discharge followed by abdominal pain. Also, study done in Uttar Pradesh, India, reported the per vaginal discharge as a most common presenting symptom [13]. However, another study done in northern India it was found that the abdominal pain was the most common presenting symptom followed by abnormal vaginal discharge [14].

It was observed that the metronidazole (79.4%) and doxycycline (78.1%) were commonly used for the treatment. Followed by clotrimazole (50%) and cefixime (45.8%). Doxycycline and cephalosporins are effective against *N. gonorrhoeae* and *C. trachomatis*, which are the common causative organisms. Metronidazole is added because of its coverage against anaerobic organisms causing PID. However, in the study of Paulose A et al., nitroimidazoles, and cephalosporin, were most commonly prescribed antimicrobial agents [14]. However, Gupta D et al., reported that antifungals were commonly prescribed followed by fluoroquinolones, aminoglycosides and doxycycline [15]. In the present study, cefixime was used more commonly than any other cephalosporins and least common was cefeperazone-sulbactam combination. It is possible that the drug resistance is less common phenomenon. As per Indian Council of Medical Research (ICMR) guidelines, cefixime, doxycycline and metronidazole are the drugs which can be prescribed for mild to moderate cases of PID. As from the cephalosporine group, cefixime was used in maximum cases it is likely that the most of the cases had mild to moderate infection [16]. Azithromycin was used in 23.2% of cases, Azithromycin can be used in case of patients who are allergic to cephalosporines and chances for gonorrhoea infection is low [4].

After antimicrobial agents the NSAIDs were used commonly as abdominal pain was the second most common symptom reported in the study. The current study suggests that the antimicrobial drug prescribing practices are adherent to treatment guidelines given by Centres for Disease Control and Prevention (CDC) and Indian Council of Medical Research (ICMR) [2,16].

Limitation(s)

Given the study's single-centre design and limited timeframe, the observed trend might not be applicable to the broader population.

CONCLUSION(S)

This study focused on understanding the drug prescription and trends with respect to PID patients. Women with PID reporting to this tertiary health care facility were mostly young adults (31 to 40 years). Metronidazole, doxycycline and Cefixime were the most frequently prescribed antimicrobials. Based on the findings of the study, it was concluded that the antibacterial drugs prescribed are adhering the treatment guidelines by Centres for Disease Control and Prevention and Indian Council of Medical Research guidelines.

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PARTICULARS OF CONTRIBUTORS:

- 1. Professor and Head, Department of Pharmacology, Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pune, Maharashtra, India.
- 2. Scientist-D, Department of Disease Elimination Sciences, ICMR-National Institute for Translational Virology and AIDS Research, Pune, Maharashtra, India.
- 3. Junior Resident, Department of Pharmacology, Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pune, Maharashtra, India.
- 4. Junior Resident, Department of Pharmacology, Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pune, Maharashtra, India.
- 5. Assistant Professor, Department of Pharmacology, Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pune, Maharashtra, India.
- 6. Junior Resident, Department of Pharmacology, Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pune, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Shraddha Bapat,
Pimpri, Pune, Maharashtra, India.
E-mail: shradsbapat@gmail.com

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