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Original Research Article

A Study on Prediction, Early Detection, Prevention and Management of Pelvic Inflammatory Disease (PID) and Associated Sequelae among Women Attending Gynae OPD

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Abstract:

Background: Pelvic Inflammatory Disease (PID) is a major reproductive health problem among women of reproductive age and is associated with significant short- and long-term complications, including chronic pelvic pain, infertility, ectopic pregnancy, and tubal damage. Early detection, appropriate management, and identification of risk factors are essential for reducing disease burden and preventing adverse reproductive outcomes.

Aim: To study the prediction, early detection, prevention, and management of Pelvic Inflammatory Disease (PID) and its associated sequelae among women attending the Gynecology Outpatient Department.

Methodology: This hospital-based observational study included 323 women diagnosed with PID attending the Gynecology OPD. Detailed demographic, clinical, obstetric, microbiological, laboratory, and imaging data were collected. Disease severity, treatment modalities, treatment response, and long-term sequelae were assessed. Logistic regression analysis was performed to identify independent predictors of sequelae.

Results: Vaginal discharge (81.7%), abdominal pain (mean VAS score 6.22 ± 1.76), and abnormal uterine bleeding (57.9%) were the most common presenting symptoms. Adnexal tenderness (83.3%), cervical motion tenderness (77.1%), and uterine tenderness (72.8%) were the predominant examination findings. *Chlamydia trachomatis* (25.1%) was the most common pathogen, followed by *Mycobacterium tuberculosis* (17.0%). Moderate and severe PID accounted for 46.8% and 39.6% of cases, respectively. More than half of the women (51.1%) developed sequelae, with chronic pelvic pain (10.8%), tubal blockage (10.5%), and infertility (9.3%) being the most frequent complications. Previous STI/PID history (OR=6.508), uterine fixity (OR=4.523), and poor treatment response (OR=2.123) were significant independent predictors of sequelae.

Conclusion: PID continues to impose a substantial reproductive health burden, with a high prevalence of moderate-to-severe disease and long-term complications. Early diagnosis, prompt and appropriate treatment, prevention of recurrent infections, and identification of high-risk women are crucial to reducing sequelae and improving reproductive outcomes.

Keywords: Pelvic Inflammatory Disease, PID, Reproductive Tract Infection, Chlamydia trachomatis, Genital Tuberculosis, Chronic Pelvic Pain, Infertility, Tubal Blockage, Sequelae, Risk Factors.

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Introduction

Pelvic Inflammatory Disease (PID) is a wide spectrum of infectious and inflammatory diseases of the upper female genital tract, including the uterus, fallopian tubes, ovaries and adjacent pelvic structures such as the pelvic peritoneum. It is one of the most common gynecological disorders in women of reproductive age and remains a major cause of reproductive morbidity throughout the world. PID is most frequently caused by the upward migration of microorganisms from the lower genital tract to the upper reproductive organs and is characterized by endometritis, salpingitis, oophoritis, tubo-ovarian abscess formation, and pelvic peritonitis. The disease may manifest as an acute, subacute, or chronic illness and is associated with significant diagnostic challenges due to its wide range of clinical manifestations and the high frequency of asymptomatic or subclinical infections. Despite advances in diagnos-

tic modalities and antimicrobial therapy, PID remains a major public health problem because of its impact on fertility, pregnancy outcomes and quality of life among affected women [1].

Globally, the association of PID with sexually transmitted infections (STI) burden remains strong. The World Health Organization (WHO) estimates that there are over 340 million new cases of curable STIs globally each year, many of which are related to the development of PID [2]. PID is known to be one of the most common causes of infertility and ectopic pregnancy in women of reproductive age in developed countries. In the United States, an estimated 2.5 million women report a lifetime history of PID, and nearly 800,000 new cases are diagnosed annually [3]. In countries like India, the burden is likely to be under-estimated because of under-reporting, lack of awareness, poor access to health care facilities and inadequate diagnostic facilities. PID constitutes a large proportion of gynecological outpatient visits and remains a common reproductive health problem, especially among women from socioeconomically disadvantaged backgrounds [4].

The disease predominantly affects sexually active women between 18 and 45 years of age, although it may occur outside this age group. The pathogenesis of PID is mainly characterized by the ascending migration of microorganisms from the vagina and cervix to the upper genital tract. Historically, the primary etiologic agents have been thought to be Neisseria gonorrhoeae and Chlamydia trachomatis. Recent studies have shown that PID is often polymicrobial with a mix of aerobic and anaerobic organisms. Chlamydia trachomatis causes a large proportion of cases and is usually associated with subclinical disease that can silently damage the fallopian tubes before diagnosis [5]. Other organisms that are frequently associated with PID include Mycoplasma genitalium, Gardnerella vaginalis, anaerobic bacteria such as Bacteroides species, and enteric organisms such as Escherichia coli. Genital tuberculosis is still an important etiological factor in Indian settings and contributes significantly to infertility related morbidity [6].

There are several demographics, behavioral, reproductive and procedural factors that increase the risk of developing PID. These are multiple sexual partners, unprotected sexual intercourse, early age of sexual activity, previous history of sexually transmitted infections, previous episodes of PID, septic abortion, puerperal infections and unhygienic deliveries. Invasive procedures like insertion of intra uterine contraceptive device (IUCD), dilatation and curettage (D&C), medical termination of pregnancy (MTP), hysterosalpingography (HSG) and other intra uterine manipulations may also aid entry of pathogenic organisms if proper aseptic precautions are not observed. On the other hand, barrier contraceptive methods, improved genital hygiene, prompt treatment of lower genital tract infections and health education on safe sexual practices are important in reducing the risk of PID [7].

The clinical presentation of PID varies from mild lower abdominal discomfort to severe pelvic infection with systemic manifestations. Signs and symptoms are typical lower abdominal pain, abnormal vaginal discharge, fever, dyspareunia, menstrual irregularities, dysuria and infertility. Diagnosis of PID is usually based on clinical findings, as laboratory confirmation is often difficult. The Centers for Disease Control and Prevention (CDC) recommends a high index of suspicion for PID in sexually active women presenting with lower abdominal tenderness, uterine tenderness, and cervical motion tenderness, and early initiation of treatment. However, delayed diagnosis is still common since many women have mild or nonspecific symptoms and thus disease progression and development of long-term complications [8].

The consequences of untreated or insufficiently treated PID are often devastating. Chronic inflammation can cause tubal scarring, pelvic adhesions, hydrosalpinx, pyosalpinx, Tubo-ovarian abscess formation, chronic pelvic pain, infertility and ectopic pregnancy. Goje (2023) stated that tubal damage from PID significantly increases the risk of future reproductive complications and adversely affects women's reproductive health outcomes. Studies have shown that even a single episode of PID can jeopardise fertility potential, while repeated episodes significantly increase the risk of permanent tubal damage and infertility. The psychosocial burden of infertility, chronic pain and recurrent pelvic infections contributes to the reduction of quality of life in women with these conditions [9].

Prompt diagnosis and initiation of broad-spectrum antimicrobial therapy to address the polymicrobial nature of the infection are essential for effective management of PID. Current CDC guidelines recommend outpatient treatment with combination antibiotic regimens including cephalosporins, doxycycline, and metronidazole, with severe cases requiring hospitalization and intravenous therapy. There is some recent evidence that macrolide-containing regimens may improve clinical outcomes in selected patients. This underscores the need for continual evaluation of treatment strategies. In cases with Tubo-ovarian abscess or failure of medical therapy, surgical intervention may be required [10].

Within India, especially in resource poor settings, issues such as low levels of awareness, delayed health seeking, unavailability of diagnostic facilities and lack of adequate screening programs continue to hamper effective prevention and management of PID. However, limited data is available regarding prediction, early detection, prevention and compre-

hensive management of PID and its sequelae in eastern India [11].

Hence, the present study was conducted in the Department of Obstetrics and Gynecology, Nalanda Medical College and Hospital (NMCH), Patna to study the clinical profile, risk factors, early detection, preventive measures, management and associated sequelae of PID among women attending the Gynecology Outpatient Department. The findings of this study are expected to provide important information for improving early diagnosis, optimizing treatment, enhancing preventive interventions, and minimizing the reproductive and psychosocial burden associated with PID in this population.

Methodology

Study Design: This study was a hospital-based prospective observational study conducted to assess the prediction, early detection, prevention, and management of Pelvic Inflammatory Disease (PID) and its associated sequelae among women attending the Gynecology Outpatient Department (OPD).

Study Area: The study was conducted in the Department of Obstetrics and Gynecology, Nalanda Medical College and Hospital (NMCH), Patna, Bihar, India.

Study Duration: The study was carried out over a period of one year, from April 2025 to March 2026.

Sample Size: The sample size was calculated using the standard formula:

$$n = \frac{Z^2 \times p \times q}{d^2}$$

Where:

- Z = 1.96 at 95% confidence level
- p = 0.30 (expected prevalence of PID)
- q = 0.70 (1 − p)
- d = 0.05 (absolute precision)

The calculated sample size was 322.69, which was rounded off to 323 participants. Therefore, a total of 323 women were enrolled in the study.

Sample Population: The study population comprised women aged 18–45 years attending the Gynecology OPD of NMCH, Patna, with symptoms suggestive of PID, including lower abdominal pain, vaginal discharge, or menstrual irregularities.

Data Collection: Data were collected using a predesigned and structured questionnaire after obtaining informed consent. Information collected included:

- Age, marital status, and sexual activity
- Number of sexual partners
- Contraceptive practices, especially IUCD and barrier methods
- History of lower abdominal pain, vaginal discharge, and abnormal uterine bleeding
- History of fever, weight loss, and night sweats
- Urinary symptoms and bowel complaints
- Menstrual history, including amenorrhea
- Obstetric history and history of induced abortion
- History of permanent sterilization

The collected information was recorded systematically and maintained confidentially.

Inclusion Criteria

Women fulfilling the following criteria were included in the study:

- Females aged 18–45 years
- Attending the Gynecology OPD with complaints of lower abdominal pain, vaginal discharge, or menstrual irregularities
- Willing to participate and provide informed consent

Exclusion Criteria

The following participants were excluded:

- Diagnosed cases of ectopic pregnancy (ruptured or unruptured)
- Ovarian tumors
- Twisted ovarian cysts
- Ruptured endometriotic cysts
- Complicated uterine fibroids
- Appendicitis
- Diverticulitis
- Cholecystitis
- Amoebic liver abscess
- Women unwilling to participate in the study

Ethical Consideration: Prior approval was obtained from the Institutional Ethics Committee of Nalanda Medical College and Hospital, Patna, before commencement of the study. Written informed consent was obtained from all participants. Confidentiality and anonymity of participant information were strictly maintained throughout the study, and all procedures were conducted in accordance with ethical principles for biomedical research involving human participants.

Procedure: After enrolment, detailed history taking and clinical examination were performed for all participants.

Clinical Examination: Each participant underwent:

- General physical examination for anaemia, lymphadenopathy, fever, pulse rate, and blood pressure
- Abdominal examination for tenderness, guarding, or palpable masses
- Speculum examination to identify vaginal discharge, cervicitis, cervical erosion, cervical tears, and vaginitis

- Bimanual pelvic examination to assess cervical motion tenderness, uterine tenderness, uterine mobility, adnexal tenderness, and adnexal masses

Laboratory and Diagnostic Evaluation: Relevant investigations were performed in collaboration with the Department of Microbiology and Radiology and included:

- High vaginal swab for culture and sensitivity
- Endocervical swab for detection of Chlamydia trachomatis and Neisseria gonorrhoeae by PCR/NAAT
- Complete Blood Count (CBC)
- Erythrocyte Sedimentation Rate (ESR)
- C-Reactive Protein (CRP)
- Pelvic ultrasonography
- Mantoux test and/or GeneXpert testing for genital tuberculosis wherever clinically indicated

Prevention and Management: Following evaluation, all participants received counselling regarding prevention of PID and its complications. Counselling focused on:

- Reproductive and sexual health education
- Promotion of barrier contraceptive methods
- Safe and aseptic IUCD insertion practices
- Safe and legal abortion services
- Institutional delivery practices
- Prevention of puerperal and post-procedural infections
- Importance of seeking treatment from qualified healthcare providers

Patients diagnosed with PID were managed according to standard institutional treatment protocols, and appropriate follow-up advice was provided.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using SPSS version 25.0 (Statistical Package for Social Sciences). Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to summarize the data. Associations between categorical variables were assessed using the Chi-square test. A p-value < 0.05 was considered statistically significant. Results were presented in the form of tables, charts, and graphs wherever appropriate".

Result

Table 1 illustrates the clinical symptom profile, which demonstrated that abdominal pain was a prominent presenting complaint. The mean Visual Analogue Scale (VAS) score was 6.22 ± 1.76, indicating moderate pain severity among the majority of participants. The most common symptom was vaginal discharge, among 264 women (81.7%), and only 18.3% reported no discharge. The most common presentation in women with affected women was Grade 2 discharge (35%), followed by Grade 1 (30.3%) and Grade 3 discharge (16.4%). 187 participants (57.9%) reported abnormal uterine bleeding, suggesting that menstrual disturbances were common among women with PID. Vaginal discharge, pelvic pain and abnormal uterine bleeding were the most common clinical presentation for the disease overall.

Table 1: Distribution of Presenting Symptoms Among Study Participants (n=323)

Symptom	Category	Number (n)	Percentage (%)
Abdominal Pain (VAS)	Mean: 6.22 ± 1.76		
Vaginal Discharge	Present	264	81.7
	Absent	59	18.3
Discharge Grade	Grade 1	98	30.3
	Grade 2	113	35
	Grade 3	53	16.4
	Absent	59	18.3
Abnormal Uterine Bleeding	Present	187	57.9
	Absent	136	42.1

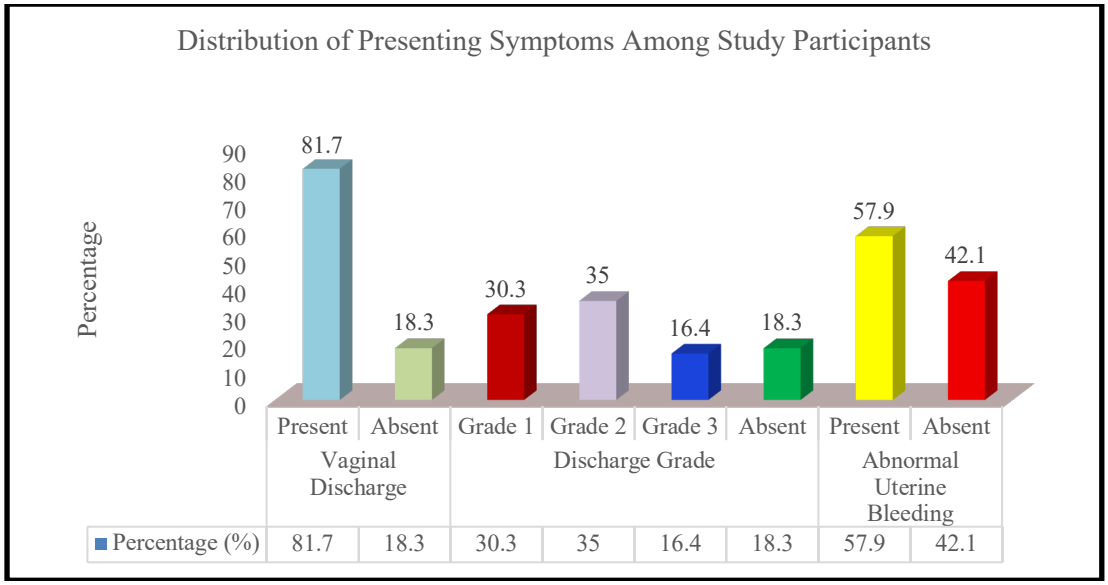

Figure 1: Distribution of Presenting Symptoms Among Study Participants

Table 2 presents the results of the pelvic examination, which revealed a high prevalence of inflammatory signs among the study participants. The most frequent clinical finding was adnexal tenderness, which was found in 269 women (83.3%), followed by cervical motion tenderness in 249 participants (77.1%) and uterine tenderness in 235 participants (72.8%). These findings of extensive pelvic inflammatory involvement correlate well with clinical diagnosis of PID. Adnexal masses were detected in 129 women (39.9%) suggestive of presence of complicated disease like tubo-ovarian pathology. Uterine fixity was observed in 84 (26%) participants indicative of chronic inflammation and pelvic adhesions in a significant number of cases.

Table 2: Distribution of Clinical Examination Findings on Pelvic Examination (n=323)

Clinical Sign	Present (n)	Absent (n)	Present (%)
Cervical Motion Tenderness (CMT)	249	74	77.1
Uterine Tenderness	235	88	72.8
Adnexal Tenderness	269	54	83.3
Adnexal Mass	129	194	39.9
Uterine Fixity	84	239	26

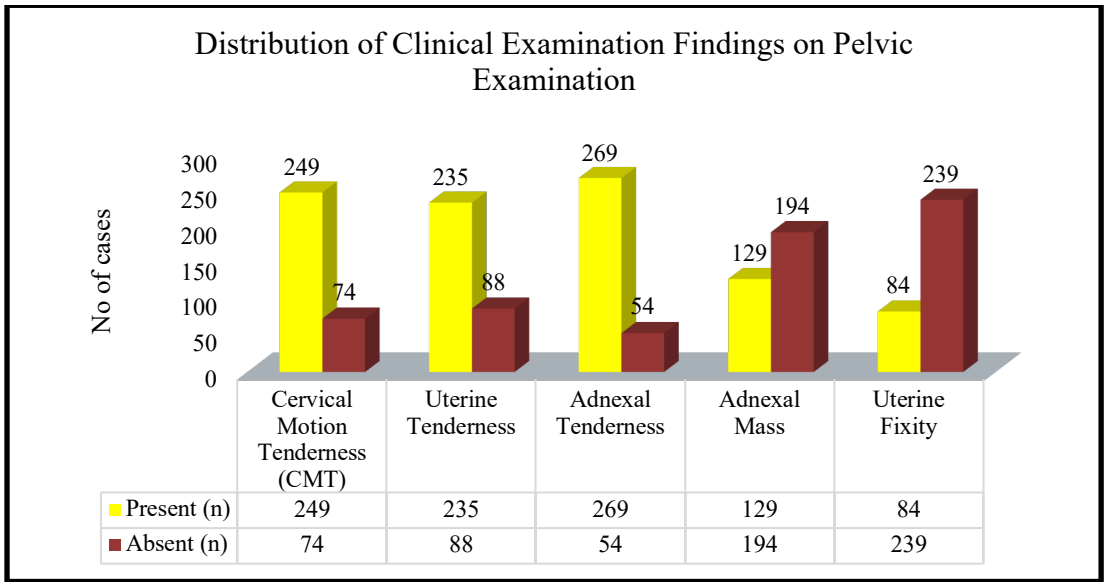

Figure 2: Distribution of Clinical Examination Findings on Pelvic Examination

Table 3. Microbiological evaluation revealed that the most common pathogen isolated was Chlamydia trachomatis, accounting for 81 cases (25.1%). Mycobacterium tuberculosis was the second most com-

mon organism, seen in 55 participants (17%) indicating the significant role of genital tuberculosis in the study group. Mixed bacterial flora was observed in 39 cases (12.1%). Staphylococcus aureus and Neisseria gonorrhoeae were isolated in 11.8% and 10.2% of participants, respectively. Other organisms, such as Escherichia coli (9%) and Streptococcus species (6.5%) were seen less frequently. Culture-negative results were observed in 8.4%. These results suggest that PID in the study population was caused by a variety of sexually transmitted and endogenous pathogens.

Table 3: Distribution of Causative Organisms Identified in Study Participants (n=323)

Causative Organism	Number (n)	Percentage (%)	Cumulative (%)
Chlamydia trachomatis	81	25.1	25.1
Mycobacterium tuberculosis	55	17	42.1
Mixed Flora	39	12.1	54.2
Staphylococcus aureus	38	11.8	66
Neisseria gonorrhoeae	33	10.2	76.2
Escherichia coli	29	9	85.2
Streptococcus spp.	21	6.5	91.7
Culture Negative	27	8.4	100.1
Total	323	100	100

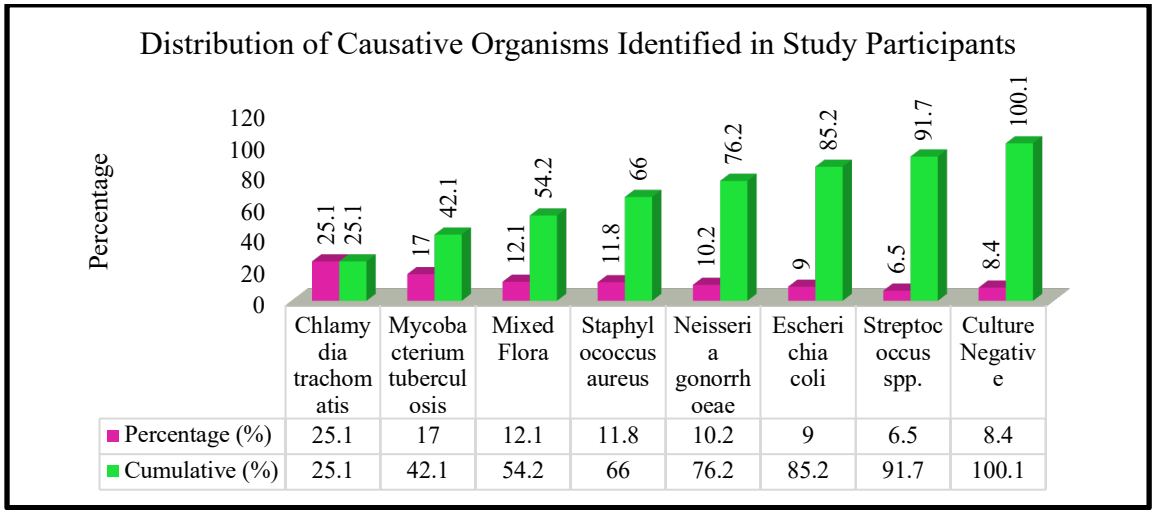

Figure 3: Distribution of Causative Organisms Identified in Study Participants (n=323)

Table 4 assessment of disease severity revealed that moderate PID was the most common presentation, affecting 151 participants (46.8%), followed by severe PID in 128 women (39.6%). Mild disease only accounted for 13.6% of cases, indicating that most women presented to medical care after developing moderate or severe illness. In terms of treatment modality, 195 participants (60.4%) were managed as outpatients with oral therapy, while 128 women (39.6%) required inpatient care and intravenous antibiotics. Of the different antibiotic regimens, the most common were cefoxitin plus doxycycline (21.1%) and doxycycline plus metronidazole (20.4%). Administration of anti-tubercular therapy in 18% of patients indicates heavy burden of tubercular PID in study population.

Table 4: PID Severity, Treatment Modality, and Antibiotic Regimen Distribution (n=323)

Variable	No	Percentage%	Category
PID Severity	44	13.6	Mild
	151	46.8	Moderate
	128	39.6	Severe
Treatment Modality	195	60.4	Outpatient (Oral)
	128	39.6	Inpatient (IV)
Antibiotic Regimen	66	20.4	Doxycycline + Metronidazole
	40	12.4	Azithromycin + Metronidazole
	47	14.5	Ceftriaxone + Doxycycline + Metronidazole
	58	18	Anti-TB Therapy (HRZE)
	68	21.1	Cefoxitin + Doxycycline (IV)
	44	13.6	Clindamycin + Gentamicin (IV)

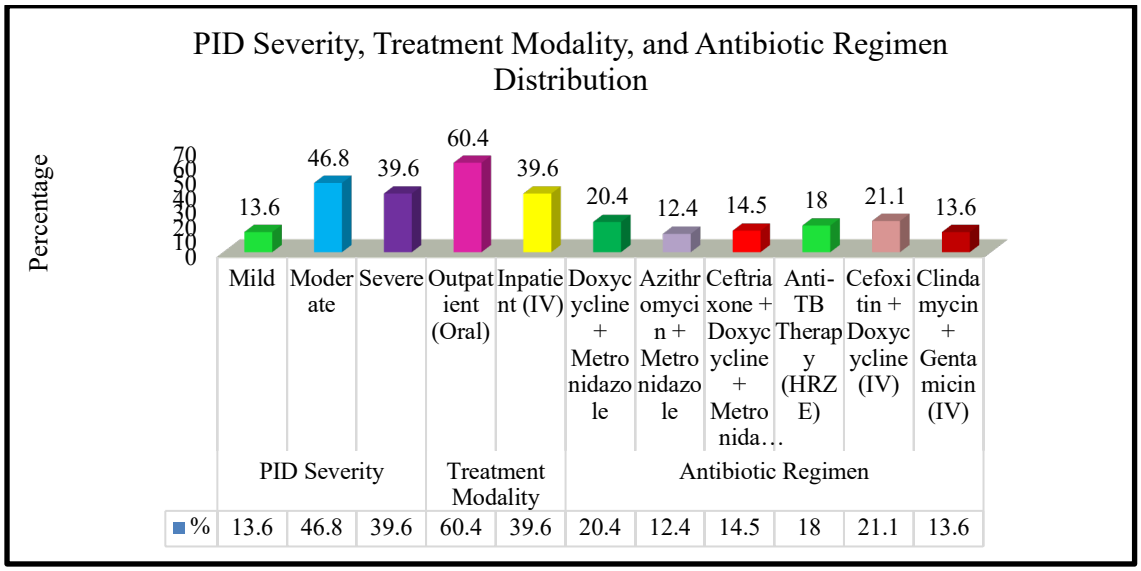

Figure 4: PID Severity, Treatment Modality, and Antibiotic Regimen Distribution

Table 5 analysis of long-term outcomes showed that 165 participants (51.1%) developed one or more sequelae following PID, indicating a substantial disease burden. Chronic pelvic pain was the most frequent complication, occurring in 35 women (10.8%), followed closely by tubal blockage in 34 cases (10.5%) and infertility in 30 cases (9.3%). Hydrosalpinx was observed in 19 participants (5.9%), while ectopic pregnancy occurred in 18 women (5.6%). Fixed retroversion of the uterus and pyosalpinx were identified in 4.6% and 4.3% of participants, respectively. These findings demonstrate the significant reproductive and gynecological consequences associated with PID, particularly its impact on fertility and chronic pelvic health.

Table 5: Type and Frequency of Sequelae Observed in Study Participants (n=323)

Type of Sequelae	No (Total=323)	Percentage% of Total	% of Cases with Sequelae (n=165)
Chronic Pelvic Pain	35	10.8	21.2
Tubal Blockage	34	10.5	20.6
Infertility	30	9.3	18.2
Hydrosalpinx	19	5.9	11.5
Fixed Retroversion of Uterus	15	4.6	9.1
Pyosalpinx	14	4.3	8.5
Ectopic Pregnancy	18	5.6	11
Any Sequelae Present	165	51.1	100

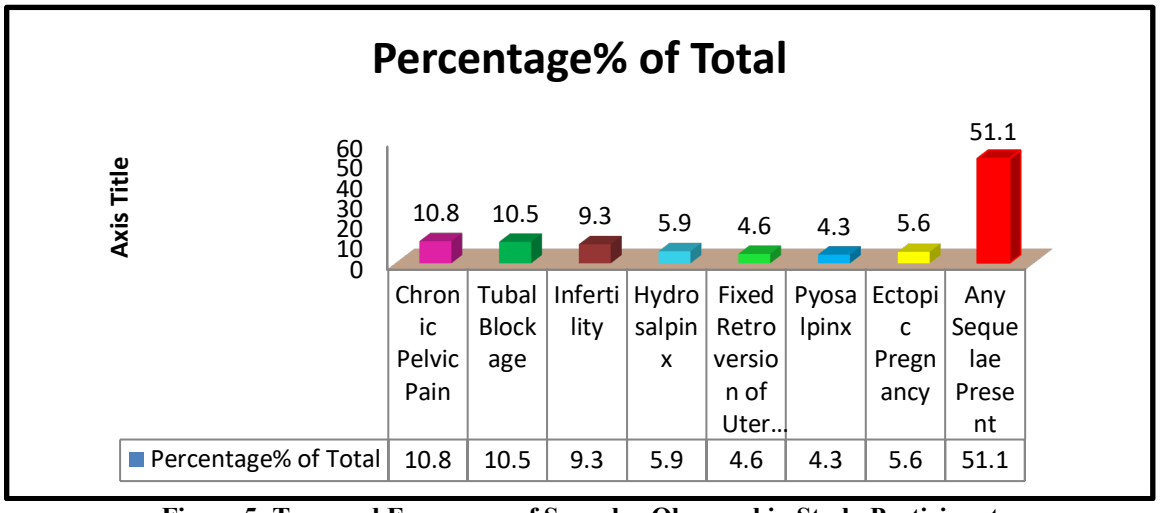

Figure 5: Type and Frequency of Sequelae Observed in Study Participant

Table 6 multivariate logistic regression analysis identified several independent predictors of sequelae among women with PID. A prior history of STI/PID emerged as the strongest predictor, increasing the odds of developing sequelae by more than sixfold (OR = 6.508; 95% CI: 3.199–13.242; p < 0.001). Uterine fixity was also significantly associated with adverse outcomes, with affected women having over four times higher odds of sequelae (OR = 4.523; 95% CI: 2.458–8.323; p < 0.001). Poor treatment response was another significant predictor, doubling the likelihood of subsequent complications (OR = 2.123; 95% CI: 1.425–3.164; p < 0.001). In contrast, age, socioeconomic status, PID severity, and multiple sexual partners did not show statistically significant associations with sequelae. These findings suggest that previous pelvic infections, chronic pelvic inflammatory changes, and inadequate treatment response are the most important determinants of long-term adverse outcomes in PID.

Table 6: Binary Logistic Regression – Independent Predictors of Sequelae in PID (n=323)

Predictor Variable	Odds Ratio (OR)	95% CI (Lower)	95% CI (Upper)	Wald p-value
Age (years)	0.979	0.945	1.014	0.2439
PID Severity	0.954	0.65	1.399	0.8088
SES	1.235	0.893	1.709	0.2024
Prior STI/PID (Yes)	6.508	3.199	13.242	<0.001
Uterine Fixity (Fixed)	4.523	2.458	8.323	<0.001
Treatment Response	2.123	1.425	3.164	<0.001
Multiple Partners (≥2)	0.727	0.398	1.328	0.2997

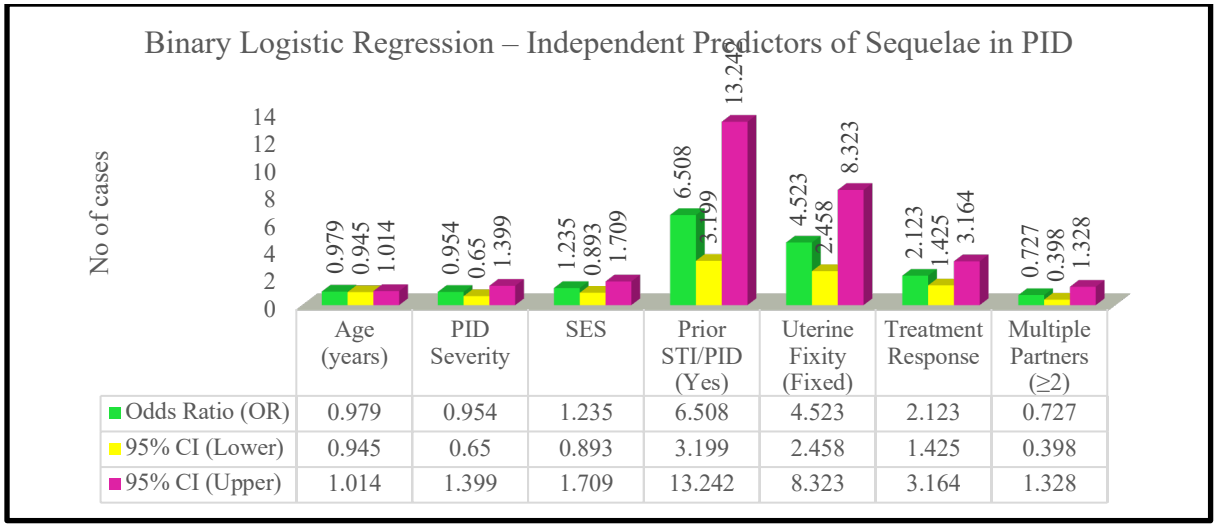

Figure 6: Binary Logistic Regression – Independent Predictors of Sequelae in PID (n=323)

Discussion

The present study is important as it gives an insight into the clinical profile, microbiological spectrum, management practices and long-term outcomes of pelvic inflammatory disease (PID) in women attending gynaecology outpatient department. Vaginal discharge was the most common presenting complaint (81.7%), followed by abnormal uterine bleeding (57.9%) and abdominal pain (mean VAS score of 6.22 ± 1.76). Similar observations have been reported by Curry et al. (2019) [12] who reported lower abdominal pain, abnormal vaginal discharge and menstrual irregularities as the most common manifestations of PID. Likewise, Jennings and Krywko (2020) [13] reported that the hallmark symptoms that prompt women to seek medical attention are pelvic pain and abnormal vaginal discharge. The prevalence of vaginal discharge in the present study was slightly higher than the reports from several western studies. This may reflect delayed health care seeking behaviour and higher burden of reproductive tract infections in developing countries. These findings underscore the importance of early recognition of symptoms for quicker diagnosis and treatment".

The current study showed high rates of pelvic examination findings including adnexal tenderness (83.3%), cervical motion tenderness (77.1%), and uterine tenderness (72.8%). These findings are in line with the diagnostic criteria proposed by Workowski et al. (2021) [14] who identified these three signs as the minimal clinical criteria for diagnosing PID. Similarly, Ross et al. (2019) [15] indicated that the most sensitive clinical signs of PID are adnexal and cervical motion tenderness. Interestingly, 39.9% females had adnexal mass and 26% had

uterine fixity which shows that a significant number of patients had advanced disease. A similar report was published by Li et al. (2021) [16] who stated that tubo-ovarian masses and pelvic adhesions are more commonly observed in severe or chronic PID and are associated with poor reproductive outcomes. The relatively high prevalence of these advanced findings in our study likely reflects late presentation and sub-optimal early treatment.

Microbiological assessment revealed that the most common pathogen was Chlamydia trachomatis (25.1%) followed by Mycobacterium tuberculosis (17.0%), mixed bacterial flora (15.8%) and Neisseria gonorrhoeae (13.6%). The predominance of chlamydial infection is in agreement with the findings of Naeem and Javed (2022) [17], who found C. trachomatis as one of the leading etiological agents of PID. Brunham et al. (2015) [18] similarly identified chlamydial infection as a significant factor in inflammation of the upper genital tract and subsequent tubal damage. However, a unique feature of the present study was the relatively high prevalence of genital tuberculosis. This finding is contrary to the studies in developed countries where tubercular PID is rare but in great agreement with Sharma et al. (2017) [19], who reported genital tuberculosis as an important cause of infertility and chronic PID in India. Our identification of sexually transmitted and endogenous pathogens further supports the polymicrobial nature of PID as described by Curry et al. (2019).

The severity distribution in this study showed that 46.8% of women had moderate PID and 39.6% had severe disease, while only 13.6% presented with mild disease. These results suggest a substantial proportion of women are seeking care after considerable disease progression. Similar trends were described by Jennings and Krywko (2020) who noted that the onset of PID is often subtle and nonspecific, leading to delayed diagnosis and advanced disease at presentation. Moreover, Curry et al. (2019) stated that moderate to severe disease is more prevalent in tertiary care, as mild cases are undiagnosed or empirically treated in primary healthcare facilities. The burden of severe disease in the present study emphasizes the need for community awareness and early screening programs.

Management patterns In the present study, 60.4% of women were treated on an outpatient basis, and 39.6% required hospitalization and intravenous antibiotic therapy. The most frequently prescribed regimens were cefoxitin plus doxycycline and doxycycline plus metronidazole. These treatment practices are consistent with the recommendations of Workowski et al. (2021) who recommend broad spectrum antibiotic coverage against both sexually transmitted and anaerobic organisms. Likewise, the Cochrane review by Savaris et al. (2020) [20] found that combination antibiotic therapy continues to be effective for the management of PID if initiated early. An interesting observation in our study was 18% of patients put on anti-tubercular therapy which indicates tubercular PID is a significant burden in the study population. This observation has been reported by Sharma et al. (2017).

One of the most important findings of the present study was the high prevalence of long-term sequelae, affecting 51.1% of the participants. The most common complication was chronic pelvic pain (10.8%), followed by tubal obstruction (10.5%) and infertility (9.3%). The findings are very similar to those reported by Weström et al. (2023) [21] who showed that, despite advances in treatment, chronic pelvic pain, infertility and ectopic pregnancy remain important long-term sequelae of PID. Similarly, Wiesenfeld et al. (2024) demonstrated that tubal damage caused by PID significantly increases the risk of infertility and adverse reproductive outcomes. The prevalence of sequelae in our study seems to be somewhat higher than that reported in developed countries, which may be due to delayed diagnosis, recurrent infections and the additional burden of genital tuberculosis in the Indian population.

The present study also identified several important predictors of adverse outcomes. Multivariate logistic regression showed that a previous history of STI/PID (OR = 6.508), uterine fixity (OR = 4.523) and poor treatment response (OR = 2.123) were independent predictors of sequelae. These results are consistent with Wiesenfeld and Sweet (2013) [22] who reported that repeated episodes of PID significantly increase the risk of infertility and chronic pelvic pain due to progressive tubal damage. Similarly, Li et al. (2021) reported that pelvic adhesions and structural abnormalities were significantly related to long-term morbidity. The strong association between treatment response and outcomes in the present study further corroborates the findings of Workowski et al. (2021), who highlighted that delayed or inadequate therapy leads to persistent infection and subsequent reproductive complications. Interestingly, age, socioeconomic status, severity of PID, and number of sexual partners did not emerge as independent predictors, suggesting that disease-related characteristics may have a greater influence on long-term outcomes than demographic variables alone.

In general, the results of the current study are in agreement with the current literature and support the idea that PID is still a major public health problem because of its high prevalence, polymicrobial etiology, frequent delayed presentation and high burden of reproductive sequelae. The associations seen between prior infection, chronic pelvic pathology and adverse outcomes further underscore the importance of prediction, early detection, prevention of recurrent infections and timely evidence-based manage-

ment to reduce long term morbidity among women with PID.

Conclusion

In conclusion, the present study reveals that pelvic inflammatory disease is still a major gynecological health problem with significant implications for the reproductive health of women. The disease was seen predominantly in women of reproductive age group and often presented with vaginal discharge, abdominal pain and abnormal uterine bleeding. Clinical examination findings especially adnexal tenderness, cervical motion tenderness and uterine tenderness were found to be useful in diagnosis. Microbiological evaluation emphasized the significance of both sexually transmitted pathogens, especially Chlamydia trachomatis and genital tuberculosis in the study population. A substantial number of women had moderate to severe disease, suggesting a delay in seeking healthcare and the potential for poor outcomes. More than half of the patients developed long-term sequelae, with the most common complications being chronic pelvic pain, tubal blockage and infertility. Previous history of STI/PID, uterine fixity and poor treatment response were identified as important independent predictors of sequelae, emphasizing the importance of early diagnosis, timely initiation of appropriate antimicrobial therapy, effective management of recurrent infections and close follow-up of high-risk patients. The findings underscore the need for strengthened preventive strategies, improved awareness, timely screening and comprehensive management approaches to reduce disease progression and minimize the long-term reproductive and gynecological burden associated with PID.

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