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Research Article

Clinical Profile and Treatment Outcomes of Pelvic Inflammatory Disease among Reproductive-Age Women: A Comparative Observational Study

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ABSTRACT
Background: Pelvic inflammatory disease (PID) is a major gynecological disorder affecting women of reproductive age and is associated with significant short-term and long-term reproductive morbidity. Early diagnosis and prompt treatment are essential to prevent complications such as infertility, chronic pelvic pain, and ectopic pregnancy.
Aim: To evaluate and compare the clinical profile and treatment outcomes of pelvic inflammatory disease among reproductive-age women.
Materials and Methods: This hospital-based comparative observational study was conducted in the Department of Obstetrics and Gynecology of a tertiary care hospital over a period of one year. A total of 100 women aged 18–45 years diagnosed with PID were included in the study. Participants were divided into two groups: Group A comprising women with mild to moderate PID and Group B comprising women with severe PID requiring hospitalization. Detailed history, clinical examination, laboratory investigations, and ultrasonographic findings were recorded. Treatment outcomes including symptom resolution, duration of hospital stay, complications, and recurrence were assessed. Statistical analysis was performed using SPSS version 25.0, and a p-value <0.05 was considered statistically significant.
Results: The majority of participants belonged to the 26–35 years age group. Lower abdominal pain was the most common presenting complaint. Fever, cervical motion tenderness, elevated inflammatory markers, adnexal masses, and tubo-ovarian abscesses were significantly more common among women with severe PID. Intravenous antibiotics and surgical interventions were more frequently required in severe cases. Complete symptom resolution was observed in 92% of Group A and 76% of Group B participants. Complications occurred predominantly among severe PID cases.
Conclusion: Severe PID is associated with increased morbidity, prolonged hospitalization, and poorer treatment outcomes. Early recognition and timely management can significantly improve clinical outcomes and reduce complications.

Keywords: Pelvic Inflammatory Disease, Reproductive-Age Women, Clinical Profile, Treatment Outcome, Gynecological Infections, Tubo-Ovarian Abscess.

INTRODUCTION

Pelvic inflammatory disease (PID) is a common and significant gynecological disorder characterized by infection and inflammation of the upper female genital tract, including the uterus, fallopian tubes, ovaries, and surrounding pelvic structures. It is usually caused by ascending polymicrobial infection from the lower genital tract and is most commonly associated with sexually transmitted organisms such as Chlamydia trachomatis and Neisseria gonorrhoeae[1]. PID remains an important public health concern because of its association with serious reproductive complications including infertility, chronic pelvic pain, ectopic pregnancy, menstrual disturbances, and tubo-ovarian abscess formation. Early diagnosis and prompt treatment are essential to reduce disease-related morbidity and preserve reproductive health[2].

Globally, PID affects millions of women every year, particularly those belonging to the reproductive age group. According to the

Centers for Disease Control and Prevention (CDC), more than one million women in the United States experience an episode of PID annually[3]. The burden is higher in developing countries due to poor genital hygiene, limited access to healthcare facilities, unsafe abortions, multiple sexual partners, and inadequate screening for sexually transmitted infections. In India, PID accounts for a substantial proportion of gynecological outpatient visits and hospital admissions among reproductive-age women. The disease commonly affects sexually active women aged between 15 and 45 years, with higher prevalence observed among women of lower socioeconomic status[4].

Clinical presentation of PID varies widely, ranging from mild lower abdominal pain and vaginal discharge to severe pelvic infection associated with fever, adnexal masses, and septic complications. Because of the heterogeneous clinical manifestations, diagnosis is often challenging and delayed. Several studies have demonstrated that women with severe PID are more likely to require hospitalization, intravenous antibiotics, and surgical intervention compared to women with mild disease. Haggerty et al[5]. reported that delayed treatment of PID significantly increases the risk of infertility and recurrent pelvic infections. Similarly, Brunham and Gottlieb[6] emphasized that chronic inflammation associated with recurrent PID episodes contributes substantially to tubal factor infertility and adverse reproductive outcomes.

Previous Indian studies have evaluated the clinical profile and management outcomes of PID in tertiary care settings. Shinde et al[7]. observed that lower abdominal pain, vaginal discharge, fever, and cervical motion tenderness were the predominant clinical features among affected women, while elevated inflammatory markers and tubo-ovarian abscesses were more common in severe disease. Another study by Yusuf et al[8]. reported improved treatment outcomes with early initiation of broad-spectrum antibiotic therapy and timely inpatient management in severe cases.

Despite advances in antimicrobial therapy and diagnostic modalities, PID continues to contribute significantly to gynecological morbidity in developing countries. Limited local data comparing the clinical characteristics and treatment outcomes between mild/moderate and severe PID cases necessitate further research. Therefore, the present study was undertaken to evaluate the clinical profile, laboratory findings, and treatment outcomes of pelvic inflammatory disease among reproductive-age women and to compare outcomes between varying severities of the disease.

Aim and Objectives

Aim

To evaluate and compare the clinical profile and treatment outcomes of pelvic inflammatory disease among reproductive-age women attending a tertiary care hospital.

Objectives

1. To study the demographic and clinical characteristics of reproductive-age women diagnosed with pelvic inflammatory disease (PID).
2. To compare laboratory and ultrasonographic findings among women with different severities/types of PID.
3. To assess and compare treatment outcomes including symptom resolution, duration of hospital stay, and complications following standard treatment protocols.

MATERIALS NAD METHODS

Study Design and Setting

This hospital-based comparative observational study was conducted in the Department of Obstetrics and Gynecology at a tertiary care teaching hospital over a period of 12 months. The study was undertaken after obtaining approval from the Institutional Ethics Committee. Written informed consent was obtained from all participants prior to enrolment in the study.

Study Population

The study included women in the reproductive age group (18–45 years) who were diagnosed clinically with pelvic inflammatory disease (PID) and attended the outpatient department or were admitted to the gynecology ward during the study period.

Study Groups

Participants were categorized into two groups based on the severity/presentation of PID:

- **Group A:** Women with mild to moderate PID managed conservatively on outpatient basis.
- **Group B:** Women with severe PID requiring hospitalization and intensive treatment.

Comparisons were made between the two groups with respect to clinical profile, laboratory findings, imaging findings, and treatment outcomes.

Inclusion Criteria

1. Women aged between 18 and 45 years.

2. Patients clinically diagnosed with pelvic inflammatory disease based on history and pelvic examination.
3. Patients willing to participate and provide informed consent.

Exclusion Criteria

1. Pregnant women.
2. Women with genital malignancy.
3. Patients with known immunocompromised status.
4. Women with postoperative pelvic infections.
5. Patients unwilling to participate in the study.

Sample Size Calculation

The sample size was calculated using the formula for comparison of two proportions based on treatment success rates reported in previous literature.

A previous study by Clinical profile and treatment outcome of pelvic inflammatory disease in reproductive age women reported treatment success rates of approximately 85% among women with mild PID and 60% among women with severe PID.

The sample size formula used was:

$$n = \frac{(Z_{\alpha/2} + Z_{\beta})^2 [P_1(1 - P_1) + P_2(1 - P_2)]}{(P_1 - P_2)^2}$$

Where:

- n= required sample size in each group
- $Z_{\alpha/2}$= 1.96 at 95% confidence level
- Z_{β}= 0.84 at 80% study power
- P_1= proportion of favorable outcome in mild PID group = 0.85
- P_2= proportion of favorable outcome in severe PID group = 0.60

Substituting the values:

$$n = \frac{(1.96 + 0.84)^2 [(0.85 \times 0.15) + (0.60 \times 0.40)]}{(0.25)^2}$$

$$n = \frac{7.84(0.1275 + 0.24)}{0.0625}$$

$$n = \frac{7.84 \times 0.3675}{0.0625}$$

$$n = \frac{2.88}{0.0625}$$

$$n \approx 46$$

Therefore, the minimum sample size required was 46 participants in each group. Considering possible non-response and incomplete data, the sample size was rounded off to 50 participants per group.

Thus, the final total sample size was:

- **Group A**: 50 participants
- **Group B**: 50 participants
- **Total sample size**: 100 participants

Sampling Technique

A consecutive sampling method was adopted. Eligible patients fulfilling the inclusion criteria during the study period were recruited until the required sample size was achieved.

Study Procedure

Detailed clinical history was obtained from all participants using a predesigned semi-structured proforma. Information regarding age, marital status, parity, socioeconomic status, menstrual history, contraceptive usage, sexual history, previous history of sexually transmitted infections, and presenting complaints was recorded.

General physical examination and systemic examination were performed. Pelvic examination included assessment for cervical motion tenderness, uterine tenderness, adnexal tenderness, vaginal discharge, and adnexal masses.

Investigations

The following investigations were carried out wherever indicated:

- Complete blood count
- Erythrocyte sedimentation rate (ESR)
- C-reactive protein (CRP)
- Urine routine examination
- High vaginal swab and endocervical swab for microbiological analysis
- Serological tests for sexually transmitted infections
- Ultrasonography of abdomen and pelvis

PID diagnosis was established based on clinical findings supported by laboratory and ultrasonographic evidence.

Treatment Protocol

Patients were treated according to standard institutional protocols and CDC guidelines for pelvic inflammatory disease.

- Mild to moderate cases received outpatient oral antibiotic therapy.
- Severe cases requiring admission received parenteral antibiotics, analgesics, intravenous fluids, and supportive management.
- Surgical intervention was performed when indicated, such as in tubo-ovarian abscess or failure of medical management.

Patients were followed up to assess symptom improvement, complications, duration of hospital stay, and treatment response.

Outcome Measures

The primary outcome measures included:

1. Resolution of symptoms following treatment.
2. Duration of hospital stay.

3. Requirement of surgical intervention.
4. Occurrence of complications.
5. Recurrence or persistence of symptoms during follow-up.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using Statistical Package for Social Sciences (SPSS) software version 25.0. Categorical variables were expressed as frequencies and percentages. Continuous variables were presented as mean ± standard deviation. The Chi-square test or Fisher's exact test was used for comparison of categorical variables, while the independent t-test was used for continuous variables. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Table 1. Distribution of Study Participants According To Age Group

Age Group (Years)	Group A (n=50)	Group B (n=50)	Total (n=100)	p-value
18–25	14 (28%)	10 (20%)	24 (24%)	
26–35	24 (48%)	22 (44%)	46 (46%)	
36–45	12 (24%)	18 (36%)	30 (30%)	0.312
Mean ± SD	**30.8 ± 6.2**	**32.4 ± 5.8**	**31.6 ± 6.0**	

The majority of participants belonged to the 26–35 years age group in both study groups. No statistically significant difference in age distribution was observed between the groups ($p>0.05$).

Table 2. Comparison of Clinical Presentation among Study Groups

Clinical Features	Group A (n=50)	Group B (n=50)	p-value
Lower abdominal pain	42 (84%)	48 (96%)	0.046
Vaginal discharge	36 (72%)	41 (82%)	0.234
Fever	12 (24%)	34 (68%)	<0.001
Dyspareunia	18 (36%)	29 (58%)	0.028
Menstrual irregularity	15 (30%)	22 (44%)	0.147
Cervical motion tenderness	31 (62%)	45 (90%)	0.001

Fever, dyspareunia, and cervical motion tenderness were significantly more common among women with severe PID compared to mild/moderate PID.

Table 3. Laboratory and Ultrasonographic Findings in Study Participants

Investigation Findings	Group A (n=50)	Group B (n=50)	p-value
Elevated ESR (>20 mm/hr)	28 (56%)	43 (86%)	0.001
Elevated CRP	20 (40%)	39 (78%)	<0.001
Leukocytosis (>11,000/mm³)	16 (32%)	37 (74%)	<0.001
Adnexal mass on USG	5 (10%)	19 (38%)	0.001
Tubo-ovarian abscess	1 (2%)	11 (22%)	0.002

Inflammatory markers and ultrasonographic abnormalities were significantly higher among women with severe PID.

Table 4. Treatment Modalities and Hospital Stay Among Study Groups

Treatment Variables	Group A (n=50)	Group B (n=50)	p-value
Oral antibiotics only	44 (88%)	8 (16%)	<0.001
Intravenous antibiotics	6 (12%)	50 (100%)	<0.001
Surgical intervention	0 (0%)	9 (18%)	0.003
Mean hospital stay (days)	1.2 ± 0.5	6.4 ± 2.1	<0.001

Women with severe PID required significantly more intravenous therapy, surgical management, and longer hospital stay compared to Group A.

Table 5. Treatment Outcomes among Study Participants

Treatment Outcome	Group A (n=50)	Group B (n=50)	p-value
Complete symptom resolution	46 (92%)	38 (76%)	0.028
Persistent symptoms	3 (6%)	8 (16%)	0.110
Recurrence during follow-up	1 (2%)	4 (8%)	0.169
Complications	0 (0%)	7 (14%)	0.006
Overall favorable outcome	47 (94%)	39 (78%)	0.021

Treatment outcomes were significantly better among women with mild to moderate PID compared to those with severe PID. Complications were observed predominantly in the severe PID group.

DISCUSSION

Pelvic inflammatory disease (PID) remains a major cause of gynecological morbidity among reproductive-age women, particularly in developing countries. The present comparative study evaluated the clinical profile and treatment outcomes among women with mild/moderate and severe PID and demonstrated significant differences in clinical manifestations, laboratory findings, management requirements, and outcomes between the two groups.

In the present study, the majority of women belonged to the 26–35 years age group, which is consistent with the findings of Sharma et al., who reported that PID predominantly affects sexually active women in the reproductive age group because of increased exposure to ascending genital tract infections. Similar observations were also made by Danielle et al., where most patients were between 25 and 35 years of age. This age distribution may be attributed to higher sexual activity, multiparity, and increased vulnerability to reproductive tract infections during these years[6,9].

Lower abdominal pain was the most common presenting complaint in the present study, followed by vaginal discharge and fever. Cervical motion tenderness was significantly more common among women with severe PID. These findings are comparable with the study conducted by Haggerty and Ness[5], who identified pelvic pain, adnexal tenderness, and abnormal vaginal discharge as the predominant clinical manifestations of PID. Pietro et al[10]. also observed that fever and cervical motion tenderness were significantly associated with severe pelvic infections requiring hospitalization.

The present study demonstrated significantly elevated ESR, CRP, leukocytosis, and higher incidence of adnexal masses and tubo-ovarian abscesses among severe PID cases. Similar findings were reported by Brunham et al.[6], who emphasized that elevated inflammatory markers are strongly associated with severe upper genital tract inflammation and complications. Munro et al[11]. reported tubo-ovarian abscess formation in women with delayed presentation and recurrent infections, highlighting the importance of early diagnosis and treatment.

Regarding treatment modalities, intravenous antibiotic therapy and surgical intervention were significantly more common among severe PID cases in the present study. These findings are in accordance with CDC treatment guidelines and the observations of Workowski et al., who recommended inpatient management for women presenting with severe illness, abscess formation, or failure of outpatient therapy[12]. Surgical management in severe PID is usually reserved for patients with persistent abscesses or poor response to antibiotics.

In the present study, complete symptom resolution was observed in 92% of women with mild/moderate PID compared to 76% among severe PID cases. Complications and recurrence were more frequent among severe cases. Similar outcomes were reported by Taylor et al.[13], who found that delayed presentation and advanced disease severity were associated with prolonged hospitalization and poorer therapeutic response. Haggerty et al[5]. also reported that recurrent or inadequately treated PID significantly increases the risk of chronic pelvic pain, infertility, and ectopic pregnancy.

Overall, the findings of the present study emphasize that early identification and prompt initiation of appropriate antibiotic therapy are essential to prevent disease progression and reduce reproductive morbidity associated with PID. Comparative evaluation of disease severity helps in optimizing treatment strategies and improving clinical outcomes among reproductive-age women.

Limitations

The study was conducted in a single tertiary care center with a relatively small sample size, which may limit the generalizability of the findings. Microbiological confirmation of causative organisms was not available in all

cases. Long-term follow-up to assess infertility, chronic pelvic pain, and recurrent PID could not be performed. Further multicentric studies with larger sample sizes and prolonged follow-up are recommended.

CONCLUSION

Pelvic inflammatory disease remains an important cause of morbidity among reproductive-age women and presents with varied clinical manifestations ranging from mild pelvic discomfort to severe pelvic infections with complications. The present study demonstrated that women with severe PID had significantly higher inflammatory markers, greater ultrasonographic abnormalities, increased need for hospitalization and surgical intervention, and comparatively poorer treatment outcomes than women with mild to moderate disease. Early diagnosis, prompt initiation of appropriate antibiotic therapy, and timely management are essential to prevent complications and improve reproductive health outcomes.

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