

Pelvic Inflammatory Disease (PID): Long-Term Reproductive Health Consequences – A Hospital-Based Observational Study at S.K.M.C.H., Bihar

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Abstract

Background: Pelvic Inflammatory Disease (PID) is a common gynecologic disease caused by the ascent of microorganisms to the upper female reproductive tract. This is a significant public health issue due to the link with chronic pelvic pain, recurrent infections, infertility and ectopic pregnancy. Though crucial for the health of women, few studies have been conducted regarding the long-term reproductive effect of PID among women in Bihar.

Methods: This was a cross-sectional study done in the department of obstetrics and gynecology, SKMCH, Bihar, from July to December 2025 in a hospital setting. A total of 100 women aged between 18-45 years were enrolled conveniently with a history of PID. Structured questionnaires were used for data collection and it is analyzed by SPSS and Microsoft Excel.

Results: Of the 100 respondents, 44% complained of difference from regular menstruation, 39% of chronic pelvic pain, 32% of infertility, 28% recurrent PID and 11% ectopic pregnancy. There was a significant correlation between the total number of PID episodes and infertility ($\chi^2 = 8.21$, $p = 0.016$), suggesting a positive association between repeated PID episodes and poor fertility outcomes. Higher prevalence of infertility among women with more than one PID episode, compared to women with one episode.

Conclusion: PID causes long-term impacts on reproductive function such as incontinence, subfertility, chronic pelvic pain. Early diagnosis, prompt treatment and proper preventive measures are necessary to minimize reproductive problems and enhance women's health outcome. Improving reproductive health education and reproductive health screening may help mitigate burden of PID in Bihar.

Keywords: Pelvic Inflammatory Disease, Reproductive Health, Infertility, Ectopic Pregnancy, Chronic Pelvic Pain, Women's Health, Bihar.

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Introduction

PID is a serious condition of the upper female reproductive organs (womb, fallopian tubes, ovaries and the surrounding parts) that is caused by infectious and inflammatory disease [1]. The usual cause of PID is the invasion of microorganisms from the lower vagina or womb into the upper reproductive organs which result in destructive changes in the tissues and immune responses.

The condition is frequently related with Sexually Transmitted Infections (STIs) including Chlamydia trachomatis and Neisseria gonorrhoeae infections, amongst others, with aerobic and anaerobic bacteria can also play a part in the development of

the condition [2]. PID is considered to be a significant public health problem as it can result in serious reproductive problems if not treated and diagnosed in time.

PID is a common disorder among women of reproductive age and occurs in millions across the world every year. PID is especially a burden in low- and middle-income countries as these countries still do not have access to reproductive healthcare services and screening and early treatment of STIs [3]. PID is a widely observed Gynecological condition in India irrespective whether it is outpatient or hospital based.

Inadequacy of sexual health awareness, delayed seeking of health care, poor menstrual sanitation, restricted diagnostic set ups are responsible for the persistence of PID amongst women in India [4]. Though antimicrobial treatment is improved, PID still places a significant health, social and economic burden on people living with PID and the health care system.

PID is a multifactorial disease wherein the pathophysiology of infection is due to sexually transmitted pathogens as the main causative pathogens [5]. Women who have multiple sexual partners or who have sex without condoms are more likely to have infections that can lead to PID. Other risk factors include inadequate reproductive and menstrual hygiene, prior experiences with PID, early sexual activity and past history of other STI of the reproductive tract [6, 7]. Recurrent infections are a further risk of long-term damage to the reproductive system and complications.

Pathophysiology of PID is the rise of the infectious organisms from the cervix and vagina to the upper portion of the genital tract [8]. This infection occurs upwards and causes inflammation of the reproductive organs with resulting edema and destruction and scar formation. Continuous inflammation can lead to scarring and blockage of the fallopian tube(s), resulting in abnormal function of the tube(s). The resulting changes to the structure can result in long term effects on fertility and reproductive health [9].

Infertility is one of the most serious effects of PID, which usually is initiated by scarring and blockage of the fallopian tubes. Because of abnormal tubal transport of the egg, women with a history of PID are also at risk for another kind of pregnancy, one that develops outside of the uterus, called an ectopic pregnancy [10]. Long-term pain in the pelvis is also a frequent side effect, caused by continuing inflammation, adhesions and tissue damage. Additionally, recurrent infections may occur, leading to repeated episodes of pelvic inflammation and progressive reproductive tract injury [11,12]. The complications which may result can have a significant impact on the physical, emotional and social health of a woman.

Investigation of long-term reproductive effects of PID in Sri Krishna Medical College and Hospital (SKMCH), Bihar is important due to PID is a very common disease and can be a significant problem in the reproductive health of the females who attend the hospital. The identification of adverse outcomes early may help in improving prevention, diagnosis and management. Although several studies have examined PID in different populations, limited local evidence exists regarding its long-term reproductive effects among women in Bihar. This absence of regional information covers

the need of the present study which is to assess the impact on reproductive health derived from PID and to stimulate the local healthcare scenario and policies based on local information.

Objectives of the Study

- To explore the impact of long-term reproductive health issues among women with past history of PID visited to SKMCH.
- To estimate the prevalence of infertility in women with previous PID.

Materials and Methods

Study Design: The study was a hospital based observational cross sectional type study in which reproductive health effects of PID in women attending SKMCH, Bihar have been assessed. The cross-sectional approach was selected as it provided an opportunity to obtain data on reproductive outcome and factors associated with it at one time only in women with a previous history of PID.

Study Setting: The study was carried out in the Department of Obstetrics and Gynecology at SKMCH, Bihar. SKMCH is a tertiary level care hospital which provides service to a huge population of urban as well as rural areas of Bihar. The institution has a impartially large gynecological patients population, which is suitable to explore the reproductive health impacts of PID.

Study Duration: The study was carried out at six months interval from July 2025 to December 2025. This time frame allowed enough time to select participants, to collect the data, verify medical information and to organize the information collected on reproductive health outcomes.

Study Population: The study population which consisted of women who have been diagnosed as a definite case of pelvic inflammatory disease and have been attending the Outpatient Department (OPD) of gynecology of SKMCH and the Inpatient Department (IPD) of gynecology during the study period. The potential participants were selected because they have had a credible history of PID and were available during the data collection.

Sample Size: A total of 100 women were studied who had a documented history of Pelvic Inflammatory Disease. Sample size was considered suitable to gather preliminary data for long term reproductive complication among women at the study centre.

Inclusion Criteria

- Females between 18 and 45 years old.
- Hysterectomy or PID diagnosis in the past.
- Attending the Obstetrics and Gynecology Department of SKMCH during the study period.

- Willing to participate in the study.

Exclusion Criteria

- Sterilization due to congenital defects of the reproductive tract.
- Developing cancerous diseases of the reproductive system or gynecological tract.
- Lack of, or incomplete medical records.
- Patients who can't give a reliable answer, due to critical illness.
- Failure to engage in or consent to the Intervention.

Sampling Technique: Convenience sampling technique was used in selection of participants. Eligible women attending of the gynecology OPD or IPD during study period who met the inclusion criteria were approached in consecutive manner till 100 women were taken. It was chosen because of its feasibility and practicability within the time period and available resources for the study.

Data Collection Tool: A pre-tested and medical record specially prepared for the study was used to collect data.

The data regarding demographic characteristics, history of PID, obstetric and gynecological history, infertility status and previous ectopic pregnancy, chronic pelvic pain and recurrent infections, and menstrual disturbances were included. Data accuracy and completeness were assured by supplementing information from hospital records as

needed. The researcher obtained informed consent from all participants.

Ethical Considerations: Data collection began after study was given ethical approval by the Institutional Ethics Committee of SKMCH prior. There was 100% voluntary participation in the study with written informed consent being obtained from all participants. The confidentiality and anonymity of information provided by the respondents was always ensured and they were kept confidential.

Statistical Analysis: The data obtained was organized, and analyzed with SPSS software. Reproductive health outcomes and the demographic characteristics were summarized using descriptive statistics such as frequencies and percentages. Chi-square test was used to determine the relationship between selected variables and reproductive complications. The variables under the study determined statistically significant with a P value < 0.05, which means that there was a significant association between the variables under the study.

Results

There were 100 female patients with PID in the study. The socio-demographic variables, time because diagnosis and long-term reproductive health effects were evaluated.

Socio-Demographic Characteristics of Participants

Table 1: Socio-Demographic Characteristics of Participants (N=100)

Variable	Frequency	Percentage (%)
Married	78	78.0
Unmarried	22	22.0
Rural Residence	65	65.0
Urban Residence	35	35.0
Secondary Education or Below	58	58.0
Higher Education	42	42.0
Homemaker	62	62.0
Employed	38	38.0

Age Distribution of Participants

Table 2: Age Distribution of Participants

Age Group (Years)	n	%
18–25	24	24.0
26–35	46	46.0
36–45	30	30.0
Total	100	100.0

The majority of participants (46%) belonged to the 26–35 years age group, followed by 36–45 years (30%) and 18–25 years (24%).

Duration since PID Diagnosis

Table 3: Duration since PID Diagnosis

Duration	n	%
Less than 1 year	18	18.0
1–3 years	42	42.0
More than 3 years	40	40.0
Total	100	100.0

The majority of women (42%) had been diagnosed with PID 1-3 years prior.

Reproductive Complications Following PID

Table 4: Reproductive Complications Following PID

Outcome	Frequency	Percentage (%)
Infertility	32	32.0
Ectopic Pregnancy	11	11.0
Chronic Pelvic Pain	39	39.0
Menstrual Irregularities	44	44.0
Recurrent PID	28	28.0

Infertility (32%), chronic pelvic pain (39%) and menstrual irregularity (44%) were the most common complications that occurred.

Association between Number of PID Episodes and Infertility

Table 5: Association between Number of PID Episodes and Infertility

PID Episodes	Infertility Present	Infertility Absent
Single Episode	10	38
Two Episodes	12	16
Three or More Episodes	10	14
Total	32	68

There was a statistically significant correlation between number of repeated PID episodes and infertility ($\chi^2 = 8.21$, $p = 0.016$) found using chi-square analysis.

The results revealed that women with recurrent PID (more than one episode) were more likely to have an abortion when compared to those who had one episode. Additionally, chronic pelvic pain and menstrual dysfunction is a common occurrence among women with PID, further underscoring the chronic reproductive burden of PID.

The results highlight the importance of early diagnosis and proper treatment measures to avoid getting women pregnant who suffer from PID and an effective treatment to avoid the reproductive complications when they do become pregnant.

Discussion

In the present study, PID was studied to determine the long-term reproductive health effect in women visiting the SKMCH in Bihar. The results showed high prevalence rate of reproductive morbidity among women including infertility, chronic pelvic pain, menstrual irregularities and recurrent infections. There was infertility in 32% of the participants. This is similar to the study of [13] which showed that tubal scarring and obstruction is a progressive process after PID, resulting in a higher incidence of tubal infertility. Also, repeated

occurrence of PID can significantly increase the risk of infertility as found by [14]. Delayed diagnosis, and subsequent multiple infections, also play an important role in affecting fertility, according to reports from the Centers for Disease Control and Prevention (CDC). The statistically significant relationship between multiple PIDs and infertility, observed in the current study further supports these findings.

11% of the participants reported with ectopic pregnancy. The result of PID related inflammation is damage to the ciliated lining epithelial cells in the fallopian tubes, which affects the ability to transport the ovum and makes the chances of implanting in the fallopian tube even greater [15].

Epidemiological studies have also previously been conducted on an increased risk of ectopic pregnancy in women who have had a history of PID. Chronic pelvic pain was experienced by 39% of participants, and was among the common chronic complaints. These are recognized mechanisms that lead to chronic pain syndromes after PID, namely the persistent inflammation, adhesion formation and fibrotic scarring. The prevalence in the present study was comparable to past studies, revealing a significant impact on quality of life from PID. 28% of the participants were diagnosed with recurrent PID. The recurrence may be related to incomplete treatment, reinfection

from untreated sex partners, inadequate treatment and persistence of risk factors. Repeatedly can exacerbate damage to reproductive tracts which may be associated with fertility problems and chronic pain.

The variations between the present results and the published reports could be explained by the different population studied, the ability to access health services, the definitions of the disease, socio-economic status and the information they had on the issues of reproductive health. The gender-specific distribution may also have contributed to the high percentage of rural participants who were found to experience complications through delayed health care seeking and access to targeted reproductive health-related services.

Public health implications of the findings indicate that early detection, rapid antibiotic therapy, surveillance and education should be emphasized. Enhancing reproductive health programs and raising awareness about STIs could significantly cut the reproductive impact of PID in the long-term. This is more relevant in resource constrained areas like Bihar where the reproductive health issues are still important.

Limitations of the study

The current study has several limitations that must be taken into consideration when interpreting the results of the current study. First, it was done at one tertiary care centre, and so the results may not apply across the board to other populations. Second, participants in this trial were a relatively small number (100). Third, recalled information was used in some instances, thus subjecting the data to the possibility of recall bias. Also, the cross-sectional design cannot enable determination of causal links between PID and reproductive indicators. Lastly, the length of the study period may not reflect long-term reproductive effects.

Recommendations

Early identification and treatment of PID should be prioritized to prevent long-term reproductive complications. Regular STI testing should be improved, with special emphasis for high-risk groups. Women who are survivors of PID should be offered reproductive counseling after the initial. The correct and timely use of antibiotics and partner control is critical to limit re-infection. There is need to establish the Community-Based Health Education (CBHE) programs to ensure better reproductive health outcomes in Bihar on reproductive hygiene, safe sexual practices, awareness of symptoms of PID.

Conclusion

PID affects the reproductive health systems and can have long term effects. These results of the study

showed that women with a history of PID are likely to have problems with their periods of menstruation, undergo frequent infections, and suffer from menstrual pain and fertility problems. Infertility was significantly related to repeated episodes of PID. To reduce negative outcomes, it is important to diagnose early, treat properly and institute preventative reproductive health interventions. In Bihar, there is a need for better awareness, screening and women's health care services to alleviate the burden of PID and benefit women's reproductive health.

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