International Journal of Obstetrics and Gynaecology
www.obstetricsjournals.com
Online ISSN: 2664-8342, Print ISSN: 2664-8334
Received: 01-01-2021, Accepted: 16-01-2021, Published: 30-01-2021
Volume 3, Issue 1, 2021, Page No. 1-6

Analysis regarding etiological aspect and clinical features of pelvic inflammatory disease (PID)

Srabani Barua[1*], Syeda Yeasmin Akter[1], Kamrun Nesa Begum[2], Bonita Biswas[2], Monowara Sultana Rosy[3]
[1] Junior Consultant, Department of Obstetrics and Gynaecology, Chittagong Medical College and Hospital, Chattogram, Bangladesh
[2] Assistant Professor, Department of Obstetrics and Gynaecology, Chittagong Medical College and Hospital, Chattogram, Bangladesh
[3] Medical Officer, Anowara Upazilla Health Complex, Anowara, Chattogram, Bangladesh

Abstract
Inflammatory disease of pelvic organ (PID) and its association with sub fertility and chronic pelvic pain is an important issue in recent days gynaecological practice. PID is a complex, insufficiently studied problem associated with serious medical, social and economic losses worldwide. Because of widespread sufferings, high treatment cost associated with PID and its sequel investment in prevention offers clear benefit than treatment. The study aims to analyse the etiological and clinical features of PID which may have an important impact in prevention as well as improved diagnosis and early management of PID and its sequele. It is a cross sectional study carried out in the outpatient Department of Obstetrics and Gynaecology, Chittagong Medical College Hospital, Chattogram, Bangladesh from October 2013 to April 2014. In this study 54% patient belonged to the age group 26-35 years, 96% married and 86% was housewife. More than 60% patient had home delivery by untrained birth attendant with puerperal sepsis in 54% patient, 54% patient had history of MR and 11% inserted IUCD, 37% patient had no history of contraception.

Keywords: pelvic inflammatory disease (PID), sexually transmitted disease (STD), Chlamydia trachomatis, infertility

Introduction

Pelvic Inflammatory Disease (PID) is a major cause of morbidity in young women and it is becoming more common [1]. Sexually active women younger than 25 years are at greatest risk [2], although PID can occur at any age. It constitutes 8-10% of the cases attending in the outpatient department of Chattogram Medical College Hospital [3]. The incidence is also high in the western countries. In the US pelvic inflammatory disease is the significant serious infection encountered by women, the disease afflicts more than one million women each year and generates annual health care costs of approximately 4.2 billion dollars.4 It is responsible following nearly 2, 50, 000 hospitalization per year [4] and account for 1 in 60 GP consultancies by women under the age of 45 [5]. It is estimated that 1 in 8 sexually active adolescent girls will develop PID before reaching age of 20 [6]. Since PID is frequently undiagnosed in our country such statistics are greatly underestimated.

PID is a clinical syndrome associated with ascending spread of microorganisms from the vagina through cervix to the endometrium, fallopian tubes and or contiguous structure, not associated with pregnancy or surgery [7]. While sexually transmitted infection such as Chlamydia trachomatis and gonorrhea have been implicated as causative agents. Myocopplasma genitalium, anaerobes and other organism may also be implicated. Sequelae of PID can sometimes be very pathetic, as it causes sub-fertility which is a very gloomy event in reproductive health of a woman, as well as for her family life. Tubal occlusion with infertility occurs at a rate of 12-50% in these patient; increasing with each episode of PID [8]. Ectopic pregnancy rates are 12-15% higher in women who had an episode of PID [8], chronic pelvic pain has been associated with PID at an incidence as high as 18% [8], after a single episode of the disease.

The clinical criteria for the diagnosis of PID must include all three of [9] (1) abdominal tenderness (2) tenderness with movements of the cervix and uterus (3) adnexal tenderness and one or more of the following (a) Gram stain of the endocervix positive for gram negative intracellular Diplococci, (b) Purulent material from the peritoneal cavity by culdocentesis or laparoscopy, (c) Pelvic abscess or inflammatory complex on bimanual examination or by USG. Most women with PID typically report symtoms of bilateral lower abdominal pains, vaginal discharge, low back pain, irregular vaginal bleeding, depending on the severity of the infection, patients with PID may be minimally symptomatic or may present with toxic symptoms of fever, nausea, vomiting and severe pain.

However an increasing number of women with PID will not have classis features and Chlamydia as well as gonococci will be found in asymptomatic women. Women who experience ectopic pregnancy or infertility are often found to have “Silent” PID [10], which is usually caused by Chlamydia infection and silent PID now outnumber clinically apparent cases by a ratio of 3 to 1 [10]. Features that have been strongly associated with PID includes young age, minority race, multiple sexual partners, sexually transmitted diseases history, young age at first sexual intercourse and use of IUCD. Although sexual transmission is the most common cause bacteria may enter the body after gynecological or obstetrical procedures such as child birth, spontaneous or therapeutic or elective abortion, endometrial biopsy etc.

The best way to prevent the sexually transmitted infection

that usually causes PID is to – all women routinely receive sexual counseling, including advice to practice safe sex with the use condom, other areas of discussion include limiting the member of sexual partners and avoiding contact with high risk partners. Adolescents should be advised to delay the onset of sexual activity until the age 16 or older, Barrier contraceptives (e.g., diaphragms with spermicidal agents) and oral contraceptives are thought to reduce the risk for developing PID, IUCD should be inserted and MR should be done in selected cases and with strict aseptic way. Preventive measures also include getting prompt treatment for STD. Sexual partners should also get adequate treatment. The risk of PID can be reduced by getting regular STD screening examination and by couples being tested before initiating sexual relation [11].

Materials and Methods

The study was conducted between July 2012 and December 2012 in the Department of Obstetrics and Gynaecology, Chittagong Medical College Hospital (CMCH), Chittagong, Bangladesh. Study population was selected after fulfilling the inclusion and exclusion criteria.

Sample size was determined by using following formula:

$$n = \frac{z^2(p \times q)}{d^2}$$

Where,

n = Sample size

p = Proportion in the target population estimated to have particular character.

q = $1 - p$

z = Standard normal deviation, usually assumed at 1.96 or 2, which corresponds to 95% confident limit.

d = Degree of accuracy

Thus,

$$n = \frac{1.96^2(0.08 \times 0.92)}{(0.05)^2}$$

$$= 113.09$$

$$= 113$$

The study duration was only 6 months. So the targeted sample size could not be collected during this study duration, therefore 100 PID patients were taken in this study. PID patients were recruited for the study purposively.

Statistical Analysis

Statistical analyses were carried out by using the Statistical Package for Social Sciences version 16.0 for windows (SPSS Inc., Chicago, Illinois, USA). The quantitative observations were indicated by frequencies and percentages.

Rationale

Pelvic inflammatory disease is really a serious reproductive health hazard globally, which should be prevented and managed meticulously to improve the quality of reproductive health of millions of women worldwide. The cost which has to spend for the treatment of PID in any country is an impact on the nation. With the rising incidence of PID and its considerable impact on reproductive health of an individual, attention should be directed towards improved diagnosis and management. Therefore the study was designed to give more attention towards etiological aspects and clinical features of PID which helps in improved diagnosis and management.

Ethical Implications

The aims and objective of the study along with its procedure, alternative diagnostic methods, risk and benefits was explained to the patients in easily understandable local language and then informed consent was taken from each patient. It was assured that all records would be kept confidential and the procedure was helpful for both the physician and patients in making rational approach regarding management of the case.

Results

Table 1: Demographic profile of the study population (n=100).

Parameter	Number of Patients (n=100)	Percentage (%)
Age (in year)		
16 – 25	34	34
26 – 35	54	54
> 35	12	12
Parity (in number)		
0	4	4
1	12	12
2 – 5	52	52
> 5	32	32
Marital Status		
Unmarried	4	4
Married	96	96
Widow	3	2.88
Divorced	6	5.76
Occupation of the Patients		
Housewife	86	86
Service Holder	14	14
Occupation of Husband of the Patients		
Service Holder	58	58
Laborer	23	23
Businessman	10	10
Farmer	5	5
Educational Status		
Illiterate	44	44
Primary	35	35
Secondary and above	21	21
Socioeconomic Status		
Low	48	48
Middle	42	42
Upper	10	10

Table I shows that socio-demographic status and marital relationship has an important impact on development of PID.

Table 2: Presenting complaints of the patients (n=100).

Presenting Complaints	Number of Patients	Percentage (%)
Pain in the lower abdomen	96	96
Backache	78	78
Dyspareunia	76	76
Congestive Dysmenorrhoea	64	64
Vaginal Discharge	60	60
Painful Defaecation	16	16
Sterility	6	6

Table II shows that 96% patient of PID present with pain in lower abdomen followed by backache (78%) and dysperunia (76%).

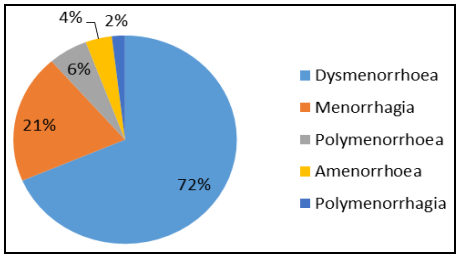

Fig 1: Menstrual problems of the patients (n=100).

Figure I shows that menstrual problem is a frequent presentation of PID in the form of dysmenorrhoea72%, menorrhagia 21%, including amenorrhoea of 4% patient.

Table 3: Relationship between delivery and PID (n=96).

Parameter	Number of Patients (n=96)	Percentage (%)
Place of Delivery		
Home	75	75
Hospital	8	8
Home and hospital	13	13
Conduction of Delivery		
Untrained Birth Attendant	63	63
Trained Birth Attendant	33	33
Complication of Delivery		
Puerperal Sepsis	54	54
Normal Puerperium	42	42

Table III shows that delivered by untrained birth attendant at home is an important etiological factor of PID aided by puerperal sepsis which constitute more than 50% of patient.

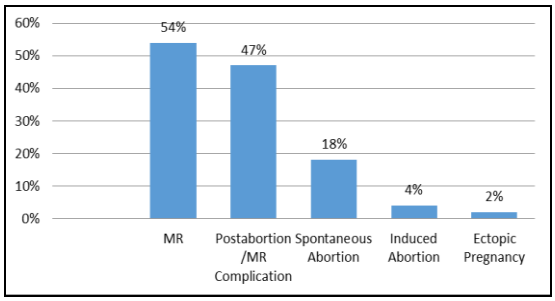

Fig 2: Relationship between termination of pregnancy including ectopic pregnancy and PID (n=100).

Figure II shows that MR, ectopic pregnancy and abortion related complication plays a significant role in development of PID where MR constitute >50% of study population.

Table 4: Contraceptive history of the patients (n=100).

Contraceptive	Number of Patients	Percentage (%)
No Contraceptive	37	37
Oral Pill	23	23
Barrier Method	3	3
Tubectomy	3	3
IUCD	11	11
Norplant	8	8
Injectable Contraceptive	7	7
Pill Plus IUCD	3	3
Pill Plus Barrier Method	3	3
IUCD Plus Barrier Method	2	2

Table IV shows that PID is highest in patient with no contraceptive (37%) and lowest in patient with barrier method (3%) which act as a protective method in development of PID.

Table 5: Examination findings (n=100).

Parameter	Number of Patients (n=100)	Percentage (%)
Anaemia		
Mild	66	66
Moderate	31	31
Severe	3	3
Perabdominal		
Tenderness in Lower Abdomen	64	64
Mass in Lower Abdomen	4	4
Perineal Tear		
Present – 1st Degree	6	6
Present – 2nd Degree	2	2
Present – 3rd Degree	0	0
Discharge		
Present	82	82
Vagina		
Healthy	88	88
Congested	12	12
Utero-Vaginal Prolapse		
Present	11	11
Cervix Look	31	31
Hypertrophied	56	56
Cervix Look Congested	11	11
Ectopion		
Bimanual Examination		
Position of Uterus Anteverted	63	63
Retroverted Mobility of Uterus:Mobile		
Restricted	46	46
Fixed	32	32
Cervical Motion	22	22
Tenderness	71	71
Tenderness of Fornices	98	98
Thickening of Fornices	68	68
Tuboovarian Mass	5	5

Table V shows that mild anaemia, lower abdominal tenderness, cervical motion tenderness, vaginal discharge and congested cervix are important findings of patient of PID.

Table 6: Investigation Profile (n=100).

Investigation	Number of Patients (n=100)	Percentage (%)
Heamoglobin Percentage (n=100)		
40 – 60	31	31
> 60	69	69
Total Count (n=100)		
4000 – 11000/cu mm	82	82
> 11000	18	18
ESR		
Normal	78	78
Elevated (> 15mm/hr)	22	22
Endocervical Swab for c/s		
No Growth	85	85
Staphylococcus Aureus	10	10
Escherichia Coli	5	5
Ultrasonogram of Lower Abdomen		
Normal	89	89
Features of PID	11	11

Table VI shows that anaemia high ESR and high WBC

count with normal USG findings and no growth in endocervical swab are important investigation findings in most of the patient of PID.

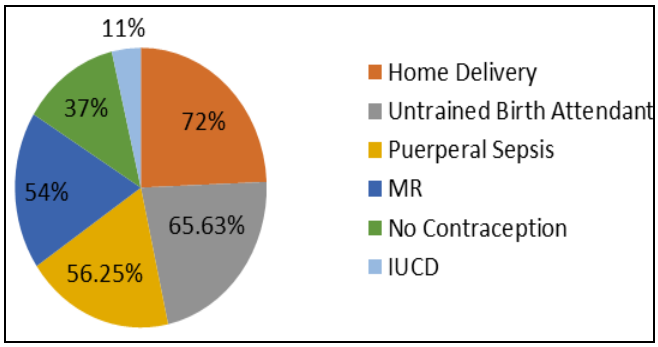

Fig 3: Etiological Factors Associated with PID

Figure III shows different etiological factors of PID where home delivery by untrained birth attendant and puerperal sepsis occupy a significant place.

Discussion

The exact incidence of PID is unknown because the disease can't be diagnosed reliably from clinical symptoms and signs[12], moreover women who have PID present to the general practitioners, gynaecologist and surgeons. Hospital discharge registries are poor surrogate markers for the true prevalence of PID. However prevalence of PID is increasing all over the world [13]. Five percent of gynaecological admissions in the hospitals of India and Pakistan are due to PID and in Africa it is 17-44 percent. With this rising incidence of PID and its considerable impact on reproductive health of an individual, attention should be directed towards improved diagnosis and management.

A detailed and methodical study of 100 cases in this series shows that highest (54%) incidence of this disease being in the age group of 26 – 35 years. Peterson also observed that women with PID are usually under the age of 25 years [14]. Shah observed that 87 percent of the patients belong to the age group 20 – 35 years [15]. Our finding is similar with that of the study done in India. PID occurs more in younger age group in western countries where the disease is mainly STD-related, but in developing countries, it is mostly non-STD related and occurs in later age group.

Marital status is often referred to as a risk factor for PID because active sexual life has an impact on the occurrence of PID. Recent history of pregnancy and abortion has been suggested to be associated with risk of PID. In the present study it has been shown that PID is most prevalent (96%) in the married group. In Bangladesh, the sexual activity in widow and separated women are very unusual.

Regarding patient's occupation 86% patients were housewife and regarding their husbands' occupation majority (55.68%) were service holder. In this study, majority (44%) of the women were illiterate, among rest 21 percent had education up to secondary level or above. It is the lack of education which makes the women ignorant about the fact that their sufferings and illness are preventable by safe childbirth and abortion practice.

In this study 48% patients belonged to the low socioeconomic group and it is difficult to draw a conclusion from this study between the socioeconomic status and PID because if we compare the incidence in other socioeconomic group (middle and higher), there is no significant difference.

Regarding parity 84% patients were multiparous, 72% were delivered at home, conducted by untrained birth attendants in 60.48% cases. Among them 51.84% cases were complicated by puerperal sepsis. This entails the pathophysiological aspect of PID. Peterson showed that PID occurred mostly in multipara[31]. But another study by Westorm revealed that 74.4% of PID cases were multiparus [16] (mostly acute cases). These studies therefore, showed that in developing countries the majority of cases were older parous women and in the industrialized countries the majority was younger multiparous women.

As it has already been proved that STD has an important role in aetiology of PID, the former being related to the sexual activity of a women and the number of her sexual partners. A survey on the sexual behavior of USA college girls showed that during the last two decades, there has been a gradual rise in premarital sex amongst them [17]. Such a change explains the prevalence of STD and hence PID in young nuliparous women.

Majority of our rural women depend primarily on untrained or relatively less trained birth attendants and relatives for child birth assistance. They conduct the delivery process in very unhygienic environment, never use any sterile gloves and conduct repeated pelvic examinations even after rupture of the membrane. This gives an opportunity for potential pathogens to pass from the lower genital tract into the normally sterile environment of uterus. It is more common, however, for the infection to remain localized in the pelvis and if effective treatment is not given immediately, there is a danger of chronic pelvic infection with tubal blockage.

In this study it has been shown that there was history of termination of pregnancy either in the form of MR or abortion (induced and spontaneous) in 76% cases. More than 50% of them developed sepsis. It is estimated that 36 – 53 million induced abortions are performed annually throughout the world of which about 21 million are unsafe abortion [15].

The rates of infectious complications for such procedure depend on precautions and technique. Ideally, MR should be done by trained persons. But in our country it is frequently done by unauthorized or untrained persons. Due to their lack of knowledge of aseptic conditions, PID occurs. The incidence of pelvic infection can also be minimized by screening and prophylactic treatment of women for STD before termination of pregnancy.

Regarding the different methods of contraception, present study showed that majority (37%) were nonusers and it was due to the fact that acceptance and sustained use of family planning methods are low in many parts of the developing world, including Bangladesh. On the other hand, most frequently used method of contraception is combined oral pill (23%) and IUCD was the third choice in this study group.

During IUCD insertion, there is introduction of vaginal and cervical organisms into the endometrial cavity and accounts for most cases of IUCD related PID. Preliminary data suggest, prophylactic use of doxycycline at the time of IUCD insertion may reduce the risk of developing PIDS [9]. The relationship between oral contraceptive and risk of PID is complex. Oral contraceptive induces increased cervical ectropion which favours cervical C, trachomatis infection. On the other hand in the upper genital tract, oral contraceptive appears to provide some protection against symptomatic infection [9]. There are several mechanisms for

this protective effect of oral contraceptive. These are the reduced menstrual blood loss producing a less favourable environment for bacterial growth, thickened cervical mucus acting as a barrier against ascending infection [18].

Major symptoms for which the patients of this series reported the obstetric and gynaecological outpatient department, Chattogram Medical College and Hospital, in order of frequency are lower abdominal pain (96%), backache (78%), dyspareunia (76%), congestive dysmenorrhoea (64%), vaginal discharge (60%) and sterility (6%), they also complained of menstrual abnormalities in the for menorrhagia (20%), polymenorrhoea (6%), polymenorrhagia (2%), dysmenorrhoea (72%).

In this study 6 cases of sub-fertility amongst which 3 were primarily sub-fertile and the rest had got secondary sub-fertility. Among these 6 cases, 2 patients had no children, e.g., their first pregnancy terminated in abortion. Their symptoms of PID started since that event and they also failed to conceive.The most common cause of acquired sub-fertility was found to be pelvic infection resulting from unsafe abortion, puerperal infection and STD. While tubal factors were present in 36% of sub-fertile women in the developed countries, that proportion reached 39% in Asia, 44% in Latin America and 85% in Africa [19].

Regarding the occurrence of another major morbidity i.e., occurrence of ectopic pregnancy, present study showed that 2 patients gave history of ectopic pregnancy.

In this study a good number of cases had cervical tear. This indicates the spread of infection to the upper genital tract from the lower genital tract.

A large number of patients showed features of chronic crevicitis. Majority of the patients showed evidence of pelvic cellulitis on bimanual examination. Adnexal mass was palpated in 5 patients. Following an acute pelvic infection, there was healing by fibrosis. This results in kinking of tubes which get adherent to the ovaries, uterus, intestine, omentum and pelvic peritoneum. This leads to the formation of tuboovarian mass.

A limited number of investigations were done. Routine blood examination showed leucocytosis in 18% cases, which may be due to superimposition of active infection on chronic changes. Among all patients, 22% had raised ESR which may be due to presence of a chronic inflammatory state. In chronic PID, it is rare to isolate the causative organism from the endocervical swab. In this study endocervical swab for culture and sensitivity showed that in 5% cases, the isolated organism was E.coli and in 10% it was S. aureus.

Regarding ultra sonogram of lower abdomen majority showed normal findings and only 11% showed features of PID e.g., significant collection in cul-de-sac, adnexal mass.

Conclusion

The conclusions of my study are

- 54% of PID patients belonged to the age group 26–35 years.
- 96% patients were married.
- 86% were housewife.
- 44% patients were illiterate.
- 48% patients were from lower socioeconomic status.
- 78% came from urban area.
- 96% patients had pain lower abdomen, 78% backache, 76% had dyspareunia, 64% had congestive dysmenorrhoea, 60% had vaginal discharge, 16% painful defaecation and 6% had sub fertility.
- 72% of patients had dysmenorrhoea.
- 65.63% were delivered by untrained birth attendants at home.
- 56.25% had history of puerperal sepsis.
- 54% patients had history of MR, 47% had post abortion/MR complication.
- Regarding contraceptive history 37% had no contraception, 23% used oral pill, and 8% used IUCD.

Limitation of the Study

This is a hospital based study on a small number of women. So the results of this study may not necessarily represent the overall situation of Bangladesh. As the study was done in an OPD basis, related investigations could not be done properly due to limitation of facilities and noncompliance of the patients. Treatment given and subsequent follow-up have not been included in this study.

Recommendation

Further community based study including a large number of patients may be undertaken in the future. All related investigations, treatment and subsequent follow up may be done in future.

References

1. Ross JDC and Stewart P. Dewhurst's text book of Obstetrics & Gynaecology, Edited by Keith Edmond, 7th edition, Oxford University Press, Chapt,2007:42:415.
2. Pelvic inflammatory disease-women'shealth.gov:1-800-994-9662-national women's health information center; U. S. Department of Health and Human Services, Office on Women's Health.
3. Statistics of outdoor Department of Obstetrics and Gynaecology in Chittagong Medical College and Hospital, 2004-2005.
4. Iris Reyes, Pelvic Inflammatory Disease. eMedicine-Pelvic Inflammatory Disease, 2006, 1-17.
5. Royal of College of Obstetricians and Gynaecologists, RCOG Guidline No. 32, 2003, 1-9.
6. Medical Encyclopedia: Pelvic Inflammatory disease (PID): http://www.nlm.nih.gov/medlineplus/ency/article/0008888.htm.2006; Medline Plus, 1-3.
7. Tindal BHATLA. Jeffcoate's Principles of gynaecology, 6th ed. Arnold (Publisher), London NWI 3BH, 2001, 362.
8. Peipert JF, Ness RB, Blume J, Soper DE, Holley R, Randall H *et al*. Pelvic inflammatory disease evaluation and clinical health study investigator clinical predictors of endometritis in women with symptoms and sign of pelvic inflammatory disease. AM J Obstet Gynaecol,2001:184:8856-63.
9. Washington E, Aral SO, Hanssen H, Gnimes DA, Holmes KK. Assessing risk for PID and its sequelae, JAMA,1991:266:25881-6.
10. Whitfield CR, editor. Dewhurst's textbook of Obstetrics and Gynaecology for postgraduates, 6th rd, Oxford: Blackwell Science Ltd, 1999.
11. Dutta DC, editor. Textbook of Gynaecology, 3rd ed, Calcutta: New Central Book Agency (P) Ltd, 2001.
12. Western L, Incidence, prevalence and trends of Pelvic inflammatory disease and its consequences in industrialized countries. Am J Obstet

Gynecol,1980:138:880-97.
13. Ratnam SS, Rao KB, Arulkumar S, editors, Obstetrics and Gynaecology for postgraduates, Orient Longman Limited, 1999, 2.
14. Dr Nadira Khan-Study of 150 cases of chronic pelvic inflammatory disease in Gynae outpatient Department of Dhaka Medical College and Hospital, 2001.
15. Akter HH, Rahman MH, Ahmed S. Reproductive health issue and implementation strategies in Bangladesh, 1996, 12-60.
16. Nilson CG, Vertiainen E, Widholm E. Bacterial cultures from intrauterine devices removed from the pt with pelvic inflammatory disease. Acta Obstet Gynecol Scand,1981:60(6):563-6.
17. Senayake, Kramer DG. Contraception and the aetiology of pelvic inflammatory disease: New perspective. Am J Obstet Gynecol,1988:138:852-60.
18. Scholes D, Stergachis A, Heidrich FE *et al*. Prevention of pelvic inflammatory disease by screening for cervical chlamydial infection. N Engl J Med. May 23,1996:334(21):1362-6.
19. Shah Patel S, Nagpal S. Pelvic inflammatory disease (study of 800 cases) J Obstet Gynaecol Indian,1978:28:429-35.