Pelvic Inflammatory Disease

N. N. Roy Chowdhury,
Medical Research Institute, Calcutta, West Bengal, India

Definition

Pelvic inflammatory disease, (PID) is of the upper genital tract caused by ascending spread of micro organisms from the vagina involving the endometrium, fallopian tube and contiguous pelvic organs.

It may be acute, subacute, recurrent or chronic infection caused by the following organisms (Chow et al, 1975)

1. Pyogenic (50%)

   a. Aerobes : The gram positive organisms - Staphylococcus

      The gram negatives : E Coli, pseudomonas, N. Gonorrhoea etc.

   b. Anaerobes : The gram positives - streptococcus, clostridium welchii, clostridium tetani, etc.

II. Sexually transmitted disease (STD) : N.Gonorrhoea, Chlamydia trachomalis, treponema palidium.

III. Viral: Herpes Simplex Virus Type II
Human Papilloma Virus
Haemophilus vaginalis
HIV I or II etc.

IV. Parasitic - Trichomonas Vaginalis

V. Fungal - Candida albicans

VI. Tubercular - Mycobacterium tuberculosis

Inspite of better understanding of the etiopathogenesis, improved diagnostic tools e.g. Sonar or laparoscopy and advent of wide range of antibiotics, the incidence of PID is on the rise. This is mainly due to sexual promiscuity, ready availability of contraception and abortion (Westrom 1980)

The general classification of PID is as follows (Eschenback & Holmes, 1975)

1. Pelvic inflammatory disease:

   a. Acute salpingitis
      i. gonococcal
      ii. Non-gonococcal

   b. IUD related pelvic cellulitis
   c. Tubo ovarian abscess
   d. Pelvic abscess

2. Puerperal Infection:

   a. Caesarean section (Common)
   b. Vaginal delivery (less common)

3. Post-operative gynaecological surgery

   a. Cuff cellulitis and parametritis
   b. Vaginal Cuff Abscess
   c. Tubo ovarian abscess

4. Abortion associated infections :

   a. Incomplete septic abortion

5. Secondary to other infections:

   a. Appendicitis
   b. Diverticulitis
   c. Tuberculosis

Diagnosis:

Traditionally, the diagnosis of PID is based on a triad of symptoms and signs including Pelvic pain, cervical motion, and adnexal tenderness and mass and the presence of fever.

There may also be genitourinary symptoms including lower abdominal pain, excessive vaginal discharge, menorrhagia and metrorrhagia. Some women may develop PID without any symptoms.

Investigations:

Blood : Leucocytosis more than 10,000 per cu.mm. with increase in ESR more than 15 mm. per hour.

Serological test for syphilis should be carried out for both partners in all cases.

Positive test for Gonorrhoea or Chlamydia is diagnostic.

Laparoscopy : Direct visualisation, confirming salpingitis (Odendal, 1990).

Ultrasonography : Documenting tubo-ovarian abscess.

Endometrial Biopsy : showing endometritis

Culdocentesis : Aspiration of peritoneal fluid and its white cell count: if more than 30,000 per ml. it is significant in acute PID. Bacterial culture from the fluid is also helpful in diagnosis.

Fluid obtained by Culdocentesis (Cunanan, 1983) suggesting differential diagnosis of Ruptured ectopic pregnancy, haemorrhagic corpus luteum cyst, Ruptured liver or spleen

G.I. tract bleeding
Acute salpingitis

Pus suggesting D/D of: Ruptured tubo-ovarian abscess

Ruptured appendix
Ruptured diverticular abscess
uterine abscess with myoma

Cloudy Fluid suggesting D/D of: Pelvic peritonitis.

Twisted adnexal cyst.

Other causes of peritonitis: appendicitis, pancreatitis, cholecystitis, perforated uterus.

Microbial diagnosis: It is difficult but should be attempted (Keith et al, 1986), One should not wait for the report, instead treatment should be started emperically.

The materials for identification of organisms are:

Cervical and urethral discharge
Secretion from the Bartholin's gland
Laparoscopic or laparotomy collection of pus from the fallopian tubes.

(Sweet R L et al. 1979)

The materials are to be subjected to Gram stain and culture (aerobic and anerobic)

Differential Diagnosis : PID may be confused with:

1. Appendicitis
2. Disturbed ectopic pregnancy
3. Torsion of ovarian cyst pedicle
4. Haemorrhage or rupture of ovarian cyst
5. Diverticulitis
6. Urinary tract infection

Complications:

Immediate :

1. Pelvic peritonitis
2. Septicaemia producing arthritis or myocarditis

Late : 1. Infertility - 12% after one episode
25% after two episodes
50% after three episodes

2. Chronic PID due to recurrent infection
3. Chronic pelvic pain and ill health
4. Increased incidence of ectopic pregnancy (6 to 10 fold).

Treatment of PID:

It depends upon organisms responsible for PID, namely:

Bacterial : fungal
Protozoal: Viral
Pyogenic : Staphylococcus (Gram +ve)
Streptococcus (Gram -ve)
Pyocyaneus (Gram -ve)
E. Coli (Gram -ve)
Specific Gonococcus (Gram -ve)
STD: Syphilis, Chlamydia
Tuberculosis

Principles of Therapy :

- To control the infection energetically
- To prevent infertility and late sequlae
- To prevent reinfection

Medical Treatment:

Out patient Therapy:

Adequate rest and analgesic should be administered.

- Antibiotics should be prescribed even before micorbiological report is available.
- As infection is usually polymicrobial instead of single, combination of antibiotics should be prescribed.
- All patients should receive orally for 7 to 14 days course of any one or combination :

Ampicilin : 3- 5 gm orally
Amoxycillin : 3 gm orally
Tetracycline : 1 gm loading dose and 0.5 gm. 4 times daily
Cephalosporin : 2 gm
Doxycycline : 0.1 gm. Thrice daily
Erythromycin : 0.5 gm 4 times daily
Clindamycin : 500 mg. BID
Metronidazole : 500 mg. BID

If no satisfactory result is obtained within 48 hours, the patient should be hospitalised.

Preventive Treatment :

- Aseptic and antiseptic measure should be taken even in the management of normal labour.
- Difficult and traumatic vaginal deliveries should be avoided as far as possible.
- P.P.H. should be prevented by using prophylactic intravenous injection of ergometrin.
- Prophylactic antibiotics should be used in prolonged labour, in PROM, in all instrumental deliveries and in manual removal of placenta.
- All MTPs should be done in strict aseptic surroundings with administration of prophylactic antibiotics.

Hospitalisation is indicated under the following conditions;

- When diagnosis is in reasonable doubt.
- Oral antibiotics can not be tolerated
- When parenteral antibiotics and close observation may be necessary due to peritoneal signs or abscess formation.
- Initial course of oral antibiotic therapy has failed
- All adolescents with PID should be hospitalised for compliance with medical care.
- In presence of co-existing pregnancy.

In patient therapy should include :

- Complete bed rest.
- Oral feeding should be restricted.
- Dehydration and acidosis should be corrected by I. V. fluid administration.
- I.V. antibiotic therapy should be continued for at least 48 hours and may be extended to 4 days if necessary.
- As soon as clinical features improves Doxycyclin may

be given orally 100 mg. twice daily for 4 days.

- In case of T.O. mass.: metronidazole 500 mg. thrice daily may be given orally for 5 days.

In case of septic shock developing in septic abortion the patient needs urgent hospitalization for the use of appropriate antibiotics. Blood and Electrolyte imbalance should be corrected. Adequate tissue perfusion and blood volume should be maintained. Surgical removal of infected products of conception may be necessary. Sometimes even removal of the infected uterus may have to be done.

Drugs that are used to combat septic shock may be :

- Hydrocortisone succinate 1 gm I.V. (Todd 1984) or Dexamethasone 40 mg I.M. may be repeated frequently.
- Dopamine may have to be used to increase cardiac output in the dose of 200 mg. 500 ml normal saline at initial rate of 2-5 mg./kg min. increasing upto 20mg/kg/min.
- To prevent reinfection the patient should be educated about avoiding reinfection and the potential hazard of it. She should be warned against multiple sexual partners. In such case the importance of the use of condom should be emphasised. The sexual partner or partners should also be treated effectively.

Surgery is usually not indicated in acute PID excepting under following conditions:

- Initial conservative treatment with antibiotics, fluids/blood transfusion
- Removal of products of conception in septic abortion.
- Removal of IUCD.
- Individualization of the cases should be made and cut out point should be considered as 72 hours.

Surgical intervention is indicated in:

- Questionable diagnosis
- Failure of medical therapy
- Suspected rupture of T.O. mass
- Abscess more than 8 cm. in diameter
- Complicating medical disease like diabetes mellitus
- For persistence of gross enlargement of the appendages.

Surgery is considered to be safe and likely to give best result if:

- Temperature is normal at least for one week.
- Pulse rate/temperature not increased after a test vaginal examination
- White cell count and ESR are within normal limit.

The nature of operation in such cases may be :

- Posterior colpotomy for pelvic abscess.
- Abdominal drainage of large TO. abscess when conservative therapy fails and when it lies too high to be reached safely through the vagina.
- Extra-peritoneal abdominal drainage through the flanks when abscess remains localised to the broad ligaments as in puerperal parametritis.
- Laparotomy for removal of T.O mass with or without Hysterectomy.

Hysterectomy is justified when bilateral adnexal disease is extensive and where tubo-ovarian conservation is not feasible.

Pelvic Abscess:

Fortunately incidence of pelvic abscess has gone down considerably due to early detection of acute PID along with identification of its causative organism and potent antibiotics (Grossman, 1979)

<u>The main causes of pelvic abscess are:</u>

1. Primary : 66.9% due to ascending infection without a predisposing factor such as surgery, trauma or pregnancy.
2. Secondary :
   a. following the pregnancy :
      - post abortal infection - 16.6%

- puerperal infection - 16.6%
- infected chronic ectopic pregnancy.

b. Direct extension of infection following appendicitis or diverticulitis.
c. Post Surgical

Following antibiotic treatment when pelvic abscess is localised in the POD, posterior colpotomy may be done provided ;

- Abscess is in the midline.
- Abscess is fluctuant
- Abscess must dissect the rectovaginal septum.
- USG should be done before posterior colpotomy is undertaken to locate the pockets of abscesses.

Surgical Treatment of chronic PID :

The indications are :

- Severe, progressive and persistent pelvic pain.
- Recurrent, acute exacerbation requiring frequent hospitalization
- Tubal factor causing infertility
- Progressive enlargement of T.O. mass

Selection of the exact surgical procedure depends on :

- Laparoscopic / laparotomy finding
- Type of pathological lesion with extent
- Age & parity of the patient
- Previous history of PID
- Associated pathology of adnexa

Surgical procedures to be adopted depend upon the availability of expert in endoscopic gynaecological surgeon with all the facilities of endoscopic surgery. This has replaced almost 80% cases of Laparotomy for obvious advangates of endoscopic surgery namely :

- Contamination is prevented / avoided, Thus reducing the risk of postoperative adhesions.
- Bleeding is considerably reduced.
- Scar is reduced
- Hospital stay is reduced

Surgical Procedures include :

Conservative surgery :

- Adhesionolysis when both tubes are patent.
- Unilateral salpingectomy
- Tuboplasty to ensure tubal patency, if possible - preferably by microsurgery or laparoscopic surgery.
- Consevation of the uterus and reposition of the ovaries for future invitro fertilization.

Total abdominal hysterectomy with bilateral salpingo-ophorectomy is done in majority of the cases to remove the primary pathology. Conservation of the ovaries is controversial.

Pelvic Tuberculosis :

Antituberculosis therapy (ATT) is essentially medical treatment which is primary and prolonged one consisting of :

First 6 months : INH + Rifampicin + Pyrazinamid for 2 months.
In INH resistant cases : Ethambutol should be added.
Next 12 months: Refampicin should be added with Ethambutol
Dose : INH - 300 mg/Day
Ethambutol 15-20 mg/kg/day
Rifampicin - 600 mg/day

Indication of surgery :

- Progression or persistance of active disease despite adequate medical treatment.
- Presence of large inflammatory masses - Pyosalpinx, T.O. mass, pyometra, ovarian abscess.
- Small symptomless appendages better not disturbed.
- Persistance of symptoms such as menorrhagia and pelvic pain after medical treatment.

- Each case has to be considered on its merits.
- In closed tubes restoration of fertility by tuboplasty is a forelorn hope. So there is less justification for preserving the adnexa with conservative measures.

Contraindications to Surgery : These are -

- Active tuberculosis elsewhere in the body.
- Presence of dense adhesions around the pelvic organs.
- History of tuberculous peritonitis in youth and demonstration of bovine rather than human bacilli in the endometrium.

If the patient is above the age of 40 years total abdominal hysterectomy with bilateral salpingoophorectomy is the line of treatment in T.B. affecting the upper genital tract. In younger patient, conservation of ovaries may be justified.

Disadvantages :

- Technically difficult
- More risk of injury to bowel and bladder
- Sometimes subtotal abdoinal hysterectomy with bilateral salpingooophorectomy is to be carried out.

Points to be considered :

Pre-operative :

a. Chemotherapy (multidrug) 1 to 2 weeks and
b. operation in mid cycle

Operative :

Avoid drain even if spillage occurs at operation.

Post-operative :

Chemotherapy should be continued for 6 to 12 months.

Fate of Pregnancy in Genital T.B.

	Schaefer (1976)	Southerland (1970)
No. of cases studies	7000	511
Incidence of pregnancy	5%	8%
Fullterm pregnancy	40%	40%
Abortion	20%	20%
Ectopic pregnancy	40%	40%

Sequelae and fertility status following PID. There may be :

- Development of T.O. - 30%
- Infertility due to tubal occlusion after one infection - 12.8%

After three infections - 75%

In pyogenic infection prognosis for future fertility is little better than gonococcal or tubercular salphingitis.

References :

1. Chow A W: Am. J. Obst. Gyn 122: 876, 1975
2. Cunan R G Jr.: Am. J. Obst. Gyn. 146 : 589, 1973.
3. Eschenbach d A, Holmes K K : Clin. Obst, Gyn. 18: 35 1975.
4. Grossman J H III, Obst, Gyn. 53: 537, 1979.
5. Keith I G, Gerger G S, Loper-Zeno J: Year Book Med. Chicago 18: 1986.
6. Odendal H J, Bonar J (Ed). Churchill, Livingstone, Edin. Rec. Adv. In Obst. & Gyn. 165: 1990.
7. Schaefer G: Clin. Obst. Gyn. 19: 223: 1976.
8. Sweet R L: Am. J. Obst. Gyn. 134: 68, 1979.
9. Todd, J.K.: JAMA, 252 : 3399, 1984.
10. Westrom, L.: Am. J. Obst. Gyn. 138 : 880, 1980.