Managing Pelvic Inflammatory Disease

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SUMMARY

Pelvic inflammatory disease (PID) describes the clinical features of sexually transmitted pelvic infection ranging from acute salpingitis to salpingo-oophoritis and ultimately pelvic abscess. Intra-tubal adhesions and pelvic adhesive disease are the long-term sequelae of PID which may lead to both sub-fertility and tubal ectopic pregnancy. Laparoscopy is the definitive diagnostic modality, but is invasive and not suitable for routine clinical practice especially in the primary care setting. Ascending infection by *Neiserria gonorrhoea, Chlamydia trachomatis* and less commonly bacterial vaginosis and mycoplasma have been traditionally associated as causative pathogens in PID. As polymicrobial infections are being implicated in PID before culture and sensitivity results are available empirical treatment based on clinical guidelines is justified initially. Pre-emptive testing and treatment for woman at increased risk of chlamydia has been shown to reduce the risk of PID by up to two-thirds. It is imperative that medical practitioners have low thresholds for testing and treatment of both sexually active young women and men.

KEY WORDS:
Pelvic, Inflammatory, Disease, Infection

INTRODUCTION

Pelvic inflammatory disease (PID) is a term used to describe the clinical features of sexually transmitted pelvic infection, seen in women between menarche and menopause[1]. The inflammatory process largely affects the endosalphinx through ascending infection; hence the synonymous use of acute salpingitis. The anatomical relations with the uterus medially and the ovary and peritoneum laterally, may result in more extensive inflammation. This ranges from acute salpingitis to salpingo-oophoritis and ultimately pelvic abscess, if the disease process proceeds unabated. Intra-tubal adhesions and pelvic adhesive disease are the long-term sequelae of PID[2], which in turn may lead to the increased incidence of both sub-fertility and tubal ectopic pregnancy. The true prevalence is difficult to determine: clinical presentation may be subtle, sub-clinical or overt e.g. an acute abdomen. Morbidity is high, 20% of affected women become infertile, 20% develop chronic pelvic pain and 10% of those who conceive have an ectopic pregnancy[3].

Diagnosing PID

There are no pathognomonic symptoms of PID. Laproscopy is the definitive diagnostic modality, but is invasive and not suitable for routine clinical practice especially in the primary care setting[4]. Classically, a discussion on PID should exclude infections of the pelvis related to abortions and childbirth. Post-abortal infections and puerperal sepsis are diagnosed based on clinical evidence of infection following such events and fever. Extrapulmonary tuberculosis affecting the genitor-urinary tract will require a different approach and is not discussed under PID. A coital history up to three months prior to the diagnosis of PID should be obtained as PID is recognized as an infection following sexual intercourse. Unprotected coitus, particularly with multiple partners or a new recent partner carries a higher risk of infection. The escalation of premarital sexual relations and the exploitation of sex trade workers place women of younger age groups at higher risk. Other risk factors include a past history of infection with chlamydia, gonorrhea or PID, low socioeconomic group and smoking[5,6].

Ascending infection is largely implicated in the aetiology; *Neiserria gonorrhoea,Chlamydia trachomatis* [7] and less commonly bacterial vaginosis and mycoplasma have been traditionally associated as causative pathogens in PID[8]. Insertion of intrauterine devices, dilatation and curretage and operative termination of pregnancy breach the protective cervical barrier and directly introduce bacteria into the endometrial cavity.

As patients can be asymptomatic, diagnosis can be difficult. Among the more common clinical features of PID are shown in Table I.

In consultations where abnormal vaginal discharge is associated with lower abdominal discomfort and adnexal tenderness on pelvic examination, relevant investigations should be carried out, and treatment initiated, particularly when risk factors are present. If all the symptoms and signs denoted in Table I are present a more acute clinical situation should be considered. Generally patients are symptomatic in the presence of pelvic abscess. Pelvic peritonitis relates to a more localized disease within the true pelvis manifested by tenderness on pelvic examination and a positive cervical excitation test. Both bladder and bowel disturbances may be present.

Specific diagnostic tools

Unfortunately, there are no specific laboratory tests to diagnose PID. However, specimens from the vagina and cervix should be taken for direct microscopy, culture and sensitivity prior to starting empirical treatment, as shown in Table II.

This article was accepted: 28 November 2007
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Urine culture for pathogens may be necessary when the history dictates the need for such. ESR and C-reactive proteins are non-specific but elevated values are in concordance with PID [9], and may be useful in monitoring response to treatment. When cost is a factor, there will be low priority for the latter two tests. A tubal ectopic pregnancy is an important differential diagnosis with acute presentation, and a urine pregnancy test is should be included as part of immediate investigations.

Management of Pelvic Inflammatory Disease

In the asymptomatic woman, a decision for empirical treatment may be based on history and physical examination in an attempt to reduce long term sequelae i.e tubal ectopic pregnancy and pelvic adhesive disease. Patients should be advised to avoid unprotected coitus throughout the treatment period. Counseling should include the need for effective barrier contraception and the avoidance of re-infection after successful treatment. The need for partners to be screened and simultaneous treatment should also be emphasized. The long-term complications of PID are real and must be highlighted during counseling as well as the need to screen for other sexually transmitted infections.

Supportive measures like bed rest and adequate fluid intake will provide symptomatic relief. Analgesia may be prescribed after a diagnosis is made. Hospitalization will need to be considered for the severely ill patient as pelvic sepsis warrants parenteral antimicrobials with frequent dosing. As a general rule, in the absence of generalized peritonitis or septicemia, most patients may be treated initially with oral antimicrobials. If symptoms do not subside, surgical intervention may be required to either confirm the diagnosis of PID or surgical drainage of pelvic abscesses.

Indications for Hospitalization

Hospitalization and the institution of parenteral antibiotics are warranted when the following are present:

1. Severe degree of illness
2. Immunodeficient state
3. Pregnancy (Uncommonly, PID may co-exist in early pregnancy)
4. Poor response to oral therapy.

The regimes presently recommended are stated below. The results of investigations, sensitivity of pathogens isolated to antibiotics and the cost-benefit ratio will dictate therapy.

Antimicrobial Regimes

Table III summarizes antimicrobials commonly in use. Two regimes are recommended. Where intravenous antimicrobials are initiated, they should be continued for 24 hours after clinical response before converting to oral therapy. A 14-day course is recommended for adequate treatment taking into consideration the severe long-term complications of tubal damage.

Table I: Common clinical features associated with PID

Lower abdominal pain
Vaginal discharge
Dysmenorrhoea
Abnormal per vaginal bleeding
Dyspareunia
Dysuria
Adnexal tenderness or mass
Pyrexia
Cervical tenderness

Table II: Diagnostic Tools and Potential Pathogens

Diagnostic tool	Potential pathogens
Endocervical swab	Aerobes eg Neisseria, anaerobes
Endocervical scrape/ First catch urine +/- PCR	Chlamydia
Cervical smear (if not taken in last 3 years)	Cervical dysplasia, associated with PID
PCR of urethral, rectal, vaginal swabs in transport medium/ Endocervical culture/	Gonorrhoea
High vaginal swab	Bacterial vaginosis
Pelvic Ultrasound	Demonstrates pyosalpinx and abscess
Peripheral Blood Cultures	Valuable in septicaemia.

Table III: Suggested Antibiotic Regimes

i. Outpatient Regime	Ofloxacin (Floxin) 400mg orally twice daily for 14 days or levofloxacin (Levaquin) 500mg orally once daily for 14 days; with or without metronidazole (Flagyl) 500mg orally twice daily for 14 days
	OR:
	Ceftriaxone (Rocephin) 250mg IM in a single dose or cefoxitin (Mefoxin) 2g IM in a single dose with concurrent probenecid (Benemid) 1g orally in single dose or other parenteral third-generation cephalosporin; plus doxycycline (Vibramycin) 100 mg orally twice daily for 14 days with or without metronidazole 500mg orally twice daily for 14 days
ii. Inpatient Regime	Cefotetan (Cefotan) 2g IV every 12 hours or cefoxitin 2g IV every six hours; plus doxycycline 100mg orally or IV every 12 hours
	OR:
	Clindamycin (Cleocin) 900mg IV every eight hours; plus gentamicin loading dose IV or IM (2mg per kg) followed by a maintenance dose (1.5mg per kg) every eight hours (single daily dosing may be substituted
	Ofloxacin 400mg IV every 12 hours or levofloxacin 500mg IV once daily; with or without metronidazole 500mg IV every eight hours
	Ampicillin/sulbactam (Unasyn) 3g IV every six hours; plus doxycycline 100mg orally or IV every 12 hours

Source: Sexually transmitted diseases treatment guidelines 2002. Centers for Disease Control and Prevention. MMWR Recomm Rep 2002; 51(RR-6):1 PubMed -78.

As polymicrobial infections are being implicated in PID, the pathogens and sensitivity patterns need to be considered. Chlamydia trachomatis will respond to macrolides and tetracycline. Metronidazole is effective against anaerobic bacteria and N.gonnorheae responds to penicllins, quinolones and cephalosporins. The suggested drugs may be substituted when specific agents are not available in the local context.

Holistic care

Acute abdomen and pelvic abscess may present in the surgical wards and 'on-table consultations' are not uncommon after a provisional diagnosis of 'perforated appendicitis'. Caregivers need to be aware of appropriate surgical principles so that treatment is optimal. In a patient who is suspected to have PID, particularly with abscess formation, a trial of antibiotics should be given. Failure to respond would warrant a diagnostic laparoscopy. The latter confirms the diagnosis and provides an opportunity to take specimens and drain the abscess. In the hands of the experienced, necrotic tissue and adhesions are cleared through the laparoscope. Otherwise a laporatomy may be required. Care should be taken to retain the ovaries as in most instances both ovaries and ovarian function can be retained. If the fallopian tubes are severely damaged they may need to be sacrificed. Surgical drains are not routinely left in situ. Surgical drainage of abscess and debridement should be followed by a 14 day course of antimicobials.

The post-operative period can be stormy. Surgical incision infection is a possibility and thromboprophylaxis in patients who are at moderate to high risk should be considered. Patients who are immuno-compromised need to be carefully followed up in collaboration with infectious disease specialists.

PID is often said to be the cause of peri-hepatitis and peri-hepatic adhesions (the Fitz-Curtis Syndrome) seen in about 15% of patients. It is primarily caused by chlamydial infection in the hypochodrium. However, when seen at laparoscopy there is no evidence for any specific therapy to be directed against such adhesions other than antimicrobial therapy.

As in all cases of STIs, patients are required to be followed up at both the Gynecology clinic and the Genito-Urinary Diseases clinic. Contact tracing, treatment of the partner, avoidance of re-infection and effective contraception should be included as part of the holistic care of PID. It would be wise to continue follow up of PID especially in women of child bearing age, as both sub-fertility and tubal ectopic pregnancies are well-recognized complications[10]. With each repeated episode of PID, the risk of permanent tubal damage and infertility increases 4-6 fold; from 8% after one episode to nearly 20% after two episodes and 40% after three or more[11].

Pre-emptive testing and treatment for woman at increased risk of chlamydia has been shown to reduce the risk of PID by up to two-thirds [12]. In view of the devastating sequelae of PID, it is imperative that medical practitioners have low thresholds for testing and treatment of both sexually active young women and men.

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MANAGING PELVIC INFLAMMATORY DISEASE

MULTIPLE CHOICE QUESTIONS (TRUE/FALSE)

1. Pelvic inflammatory disease (PID) includes the following:
   A. Salpingitis
   B. Oophoritis
   C. Urethritis
   D. Pelvic abscess
   E. Vaginitis

2. The following etiological agents are known to cause PID:
   A. *Neiserria gonorrhoea*
   B. *Chlamydia trachomatis*
   C. *Candida albicans*
   D. *Mycoplasma*
   E. *Mycobacterium tuberculosis*

3. Clinical features suggestive of acute PID are:
   A. Dysmenorrhoea
   B. Abnormal per vaginal bleeding
   C. Dyspareunia
   D. Abdominal pain
   E. Fever

4. The following investigations are indicated in suspected PID:
   A. Abdominal plain radiograph
   B. Endocervical swab
   C. Cervical smear
   D. High vaginal swab
   E. Pelvic ultrasound

5. The following statements is/are true about managing PID:
   A. PID may mimic acute appendicitis.
   B. Failure to respond to antibiotics treatment would warrant a diagnostic laparoscopy.
   C. Treatment for women who are at risk of chlamydia infection has been shown to reduce the risk of PID.
   D. Patient who has concurrent immuno deficiency is best managed as an inpatient.
   E. Quinolones are effective in treating PID.