

= Pelvic inflammatory disease =

Pelvic inflammatory disease or pelvic inflammatory disorder (PID) is an infection of the upper part of the female reproductive system namely the uterus , fallopian tubes , and ovaries , and inside of the pelvis . Often there may be no symptoms . Signs and symptoms , when present may include lower abdominal pain , vaginal discharge , fever , burning with urination , pain with sex , or irregular menstruation . Untreated PID can result in long term complications including infertility , ectopic pregnancy , chronic pelvic pain , and cancer .

The disease is caused by bacteria that spread from the vagina and cervix . Infections by *Neisseria gonorrhoeae* or *Chlamydia trachomatis* are present in 75 to 90 percent of cases . Often multiple different bacteria are involved . Without treatment about 10 percent of those with a chlamydial infection and 40 percent of those with a gonorrhea infection will develop PID . Risk factors are similar to those of sexually transmitted infections generally and include a high number of sexual partners and drug use . Vaginal douching may also increase the risk . The diagnosis is typically based on the presenting signs and symptoms . It is recommended that the disease be considered in all women of childbearing age who have lower abdominal pain . A definitive diagnosis of PID is made by finding pus involving the fallopian tubes during surgery . Ultrasound may also be useful in diagnosis .

Efforts to prevent the disease include not having sex or having few sexual partners and using condoms . Screening women at risk for chlamydial infection followed by treatment decreases the risk of PID . If the diagnosis is suspected , treatment is typically advised . Treating a woman 's sexual partners should also occur . In those with mild or moderate symptoms a single injection of the antibiotic ceftriaxone along with two weeks of doxycycline and possibly metronidazole by mouth is recommended . For those who do not improve after three days or who have severe disease intravenous antibiotics should be used .

Globally about 106 million cases of chlamydia and 106 million cases of gonorrhea occurred in 2008 . The number of cases of PID however , is not clear . It is estimated to affect about 1 @. @ 5 percent of young women yearly . In the United States PID is estimated to affect about one million people yearly . A type of intrauterine device (IUD) known as the Dalkon shield led to increased rates of PID in the 1970s . Current IUDs are not associated with this problem after the first month .

= = Signs and symptoms = =

Symptoms in PID range from none to severe . If there are symptoms , then fever , cervical motion tenderness , lower abdominal pain , new or different discharge , painful intercourse , uterine tenderness , adnexal tenderness , or irregular menstruation may be noted .

Other complications include endometritis , salpingitis , tubo @-@ ovarian abscess , pelvic peritonitis , periappendicitis , and perihepatitis .

= = Cause = =

Chlamydia trachomatis and *Neisseria gonorrhoeae* are usually the main cause of PID . Data suggest that PID is often polymicrobial . Isolated anaerobes and facultative microorganisms have been obtained from the upper genital tract . *N. gonorrhoeae* has been isolated from fallopian tubes , facultative and anaerobic organisms were recovered from endometrial tissues .

The anatomical structure of the internal organs and tissues of the female reproductive tract provides a pathway for pathogens to ascend from the vagina to the pelvic cavity thorough the infundibulum . The disturbance of the naturally occurring vaginal microbiota associated with bacterial vaginosis increases the risk of PID .

N. gonorrhoea and *C. trachomatis* are the most common organisms . The least common were infections caused exclusively by anaerobes and facultative organisms . Anaerobes and facultative bacteria were also isolated from 50 percent of the patients from whom *Chlamydia* and *Neisseria* were recovered ; thus , anaerobes and facultative bacteria were present in the upper genital tract of

nearly two @-@ thirds of the PID patients . PCR and serological tests have associated extremely fastidious organism with endometritis , PID , and tubal factor infertility . Microorganisms associated with PID are listed below .

= = = Bacteria involved = = =

= = Diagnosis = =

Upon a pelvic examination , cervical motion , uterine , or adnexal tenderness will be experienced . Mucopurulent cervicitis and or urethritis may be observed . In severe cases more testing may be required such as laparoscopy , intra @-@ abdominal bacteria sampling and culturing , or tissue biopsy .

Laparoscopy can visualize " violin @-@ string " adhesions , characteristic of Fitz @-@ Hugh ? Curtis perihepatitis and other abscesses that may be present .

Other imaging methods , such as ultrasonography , computed tomography (CT) , and magnetic imaging (MRI) , can aid in diagnosis . Blood tests can also help identify the presence of infection : the erythrocyte sedimentation rate (ESR) , the C @-@ reactive protein (CRP) level , and chlamydial and gonococcal DNA probes .

Nucleic acid amplification tests (NAATs) , direct fluorescein tests (DFA) , and enzyme linked immunosorbent assays (ELISA) are highly sensitive tests that can identify specific pathogens present . Serology testing for antibodies is not as useful since the presence of the microorganisms in healthy people can confound interpreting the antibody titer levels , although antibody levels can indicate whether an infection is recent or long term .

Definitive criteria include histopathologic evidence of endometritis , thickened filled Fallopian tubes , or laparoscopic findings . Gram stain / smear becomes definitive in the identification of rare , atypical or and possibly more serious organisms . Two thirds of patients with laparoscopic evidence of previous PID were not aware they had PID , however even asymptomatic PID can cause serious harm .

Laparoscopic identification is helpful in diagnosing tubal disease ; a 65 percent to 90 percent positive predictive value exists in patients with presumed PID .

Upon gynecologic ultrasound , a potential finding is tubo @-@ ovarian complex , which is edematous and dilated pelvic structures as evidenced by vague margins , but without abscess formation .

= = = Differential diagnosis = = =

A number of other causes may produce similar symptoms including appendicitis , ectopic pregnancy , hemorrhagic or ruptured ovarian cysts , ovarian torsion , and endometriosis and gastroenteritis , peritonitis , and bacterial vaginosis among others .

Pelvic inflammatory disease is more likely to reoccur when there is a prior history of the infection , recent sexual contact , recent onset of menses , or an IUD (intrauterine device) in place or if the partner has a sexually transmitted infection .

Acute pelvic inflammatory disease is highly unlikely when recent intercourse has not taken place or an IUD is not being used . A sensitive serum pregnancy test is typically obtained to rule out ectopic pregnancy . Culdocentesis will differentiate hemoperitoneum (ruptured ectopic pregnancy or hemorrhagic cyst) from pelvic sepsis (salpingitis , ruptured pelvic abscess , or ruptured appendix) .

Pelvic and vaginal ultrasounds are helpful in the diagnosis of PID . In the early stages of infection , the ultrasound may appear normal . As the disease progresses , nonspecific findings can include free pelvic fluid , endometrial thickening , uterine cavity distension by fluid or gas . In some instances the borders of the uterus and ovaries appear indistinct . Enlarged ovaries accompanied by increased numbers of small cysts correlates with PID .

Laparoscopy is infrequently used to diagnose pelvic inflammatory disease since it is not readily available . Moreover , it might not detect subtle inflammation of the fallopian tubes , and it fails to detect endometritis . Nevertheless , laparoscopy is conducted if the diagnosis is not certain or if the person has not responded to antibiotic therapy after 48 hours .

No single test has adequate sensitivity and specificity to diagnose pelvic inflammatory disease . A large multisite U.S. study found that cervical motion tenderness as a minimum clinical criterion increases the sensitivity of the CDC diagnostic criteria from 83 percent to 95 percent . However , even the modified 2002 CDC criteria do not identify women with subclinical disease .

= = Prevention = =

Regular testing for sexually transmitted infections is encouraged for prevention . The risk of contracting pelvic inflammatory disease can be reduced by the following :

Using barrier methods such as condoms ; see human sexual behavior for other listings .

Seeking medical attention if you are experiencing symptoms of PID .

Using hormonal combined contraceptive pills also helps in reducing the chances of PID by thickening the cervical mucosal plug & hence preventing the ascent of causative organisms from the lower genital tract .

Seeking medical attention after learning that a current or former sex partner has , or might have had a sexually transmitted infection .

Getting a STI history from your current partner and strongly encouraging they be tested and treated before intercourse .

Diligence in avoiding vaginal activity , particularly intercourse , after the end of a pregnancy (delivery , miscarriage , or abortion) or certain gynecological procedures , to ensure that the cervix closes .

Sexual monogamy that restricts sexual activities to two ' virgins ' or partners remaining sexually exclusive with each other and having no outside sex partners .

Abstinence

= = Treatment = =

Treatment is often started without confirmation of infection because of the serious complications that may result from delayed treatment . Treatment depends on the infectious agent and generally involves the use of antibiotic therapy . If there is no improvement within two to three days , the patient is typically advised to seek further medical attention . Hospitalization sometimes becomes necessary if there are other complications . Treating sexual partners for possible STIs can help in treatment and prevention .

For women with PID of mild to moderate severity , parenteral and oral therapies appear to be effective . It does not matter to their short- or long @-@ term outcome whether antibiotics are administered to them as inpatients or outpatients . Typical regimens include cefoxitin or cefotetan plus doxycycline , and clindamycin plus gentamicin . An alternative parenteral regimen is ampicillin / sulbactam plus doxycycline . Another alternative is to use a parenteral regimen with ceftriaxone or cefoxitin plus doxycycline . Clinical experience guides decisions regarding transition from parenteral to oral therapy , which usually can be initiated within 24 ? 48 hours of clinical improvement .

= = Prognosis = =

Even when the PID infection is cured , effects of the infection may be permanent . This makes early identification essential . Treatment resulting in cure is very important in the prevention of damage to the reproductive system . Formation of scar tissue due to one or episodes of PID can lead to tubal blockage , increasing the risk of the inability to get pregnant and long @-@ term pelvic / abdominal pain . Since certain occurrences such as a post pelvic operation , the period of time immediately after childbirth (postpartum) , miscarriage or abortion increases the risk of acquiring another

infection leading to PID .

== Complications ==

PID can cause scarring inside the reproductive system , which can later cause serious complications , including chronic pelvic pain , infertility , ectopic pregnancy (the leading cause of pregnancy @-@ related deaths in adult females) , and other complications of pregnancy . Occasionally , the infection can spread to in the peritoneum causing inflammation and the formation of scar tissue on the external surface of the liver (Fitz @-@ Hugh ? Curtis syndrome) .

== Epidemiology ==

Globally about 106 million cases of chlamydia and 106 million cases of gonorrhea occurred in 2008 . The number of cases of PID ; however , is not clear . It is estimated to affect about 1 @.@ 5 percent of young women yearly . In the United States PID is estimated to affect about one million people yearly . Rates are highest with teenagers and first time mothers . PID causes over 100 @,@ 000 women to become infertile in the US each year .