Pelvic Inflammatory Disease: updates from diagnosis to treatment

Doença Inflamatória Pélvica: atualizações do diagnóstico ao tratamento

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ABSTRACT

Pelvic inflammatory disease (PID) is a clinical syndrome caused by several microorganisms, mainly those related to sexually transmitted infections (STIs), which ascend the female genital tract towards the upper genital organs. It is a disease that affects young women, who have an active sex life and have a history of chlamydia, for example. Its clinical picture may be symptomatic, with pain in the lower abdomen being the main complaint, or in some cases the patient may be asymptomatic. The disease is confirmed by classifying the symptoms into major, minor or elaborate criteria, and by complementary laboratory and imaging tests. Its treatment can be outpatient or hospital, depending on the degree of symptoms and should be started as soon as possible, even empirically, using broad-spectrum antimicrobials. The importance of a quick diagnosis and treatment is due to the possible consequences that PID can cause, such as infertility. This literature review aims to disclose the causes and symptoms of the disease, which is one of the most important sexually transmitted infections, since the lack of a quick diagnosis and treatment, or even an inadequate treatment, increases the chances of complications for the women's health. This is a literature review on Pelvic Inflammatory Disease. A search was carried out for scientific articles in the databases Google Scholar, Scielo and indexed journals between the years 2020 to 2023, in Portuguese and English, with the following descriptors:
Pelvic Inflammatory Disease, Sexually Transmitted Infections and Chlamydia trachomatis. Even though it is a condition that affects many young women, PID is an underreported disease, therefore, it is necessary to have more teaching about sex education, since the main cause of PID is STIs.

**Keywords:** PID, STI, chlamydia.

**RESUMO**

A doença inflamatória pélvica (DIP) é uma síndrome clínica causada por diversos microrganismos, principalmente os relacionados as infecções sexualmente transmissíveis (IST), que ascendem o trato genital feminino em direção aos órgãos genitais superiores. É uma doença que acomete mulheres jovens, que tem vida sexual ativa e possuem histórico clamídia, por exemplo. Seu quadro clínico pode ser sintomático, tendo a dor em baixo ventre a principal queixa ou em alguns casos a paciente pode ser assintomática. A doença é confirmada por meio da classificação dos sintomas em critérios maiores, menores ou elaborado, e por exames complementares laboratoriais e de imagem. Seu tratamento pode ser ambulatorial ou hospitalar, dependendo do grau dos sintomas e deve ser iniciado o mais breve possível, mesmo que de maneira empírica, usando antimicrobianos de amplo espectro. A importância de um rápido diagnóstico e tratamento se deve as possíveis consequências que a DIP pode causar, como a infertilidade. Esta revisão de literatura, tem como objetivo divulgar as causas e sintomas da doença, que é uma das mais importantes infecções sexualmente transmissíveis, uma vez que a falta de um rápido diagnóstico e tratamento, ou mesmo um tratamento inadequado aumentam as chances de complicações para a saúde das mulheres. Trata-se de uma revisão de literatura sobre a Doença Inflamatória Pélvica onde realizou-se pesquisa de artigos científicos nas bases de dados Google Acadêmico, Scielo e revistas indexadas entre os anos de 2020 a 2023, em língua portuguesa e inglesa, com os seguintes descritores: Doença Inflamatória Pélvica, Infecções Sexualmente Transmissíveis e Chlamydia trachomatis. Dessa forma, mesmo sendo uma afecção que afeta muitas mulheres jovens, a DIP é uma doença subnotificada, logo, é necessário que haja maior ensinamento sobre educação sexual, uma vez que a principal causa da DIP são as ISTs.

**Palavras-chave:** DIP, IST, chlamydia.

**1 INTRODUCTION**

Pelvic inflammatory disease (PID) is an acute inflammation of the female upper genital tract and can affect the ovaries, fallopian tubes, endometrium, peritoneum and adjacent pelvic structures (CÂMARA et al., 2021).

It manifests itself acutely, chronically or subclinically and its main cause is sexually transmitted infections (STIs), caused by *Chlamydia trachomatis* and *Neisseria gonorrhoeae*, in addition to microorganisms from the vaginal microbiota, anaerobic bacteria, gram-negative bacilli and Streptococcus agalactiae. (SCHEER et al., 2021).

Sexual activity is its main risk factor, women who have multiple partners increase the risk of developing the disease by up to 4 times. Its frequency is higher in young women, mainly
in the 15 to 25 age group and with a previous history of PID; the use of oral contraceptive methods and intrauterine devices (IUD) increase the chance of acquiring the disease, whereas barrier contraception prevents the condition as it avoids endocervical gonococcal infections and chlamydia. Unfortunately, the prevalence of PID is underestimated, since the disease is not compulsory notification, so the number of affected patients is often unknown (BRASIL, 2020).

Its clinical presentation is very variable, ranging from an asymptomatic condition or with mild symptoms, to complaints such as abdominal or pelvic pain, which may or may not be associated with dyspareunia, leukorrhea and dysuria, in addition to abnormal vaginal secretion and bleeding and may evolve with tubal abscess or peritonitis. Early diagnosis of the disease is extremely important to avoid negative complications for women's health and is based on a detailed anamnesis, physical and specular examination, in addition to complementary laboratory and imaging tests (MENEZES et al. 2021).

PID can be treated on an outpatient or inpatient basis and should be started if no other diagnosis is more likely in sexually active women under the age of 25 or who have any risk factors. The therapeutic regimen must present antimicrobial coverage for the etiological agents of PID, and the notification and treatment of sexual partners is extremely important. Clinical improvement is expected after starting drug treatment and its cure is based on the disappearance of signs and symptoms, in addition to the normalization of complementary exams. Outpatient follow-up after treatment is essential, in addition to the use of barrier contraceptive methods, prevention and control of STIs (BRASIL, 2020). In this way, the main objective of this research is to gather information and inform about pelvic inflammatory disease.

2 METHODS

The study is a literature review on Pelvic Inflammatory Disease. A search for scientific articles was carried out in the databases: Google Scholar, Scielo and indexed journals between the years 2020 to 2023, in Portuguese and English, with the following descriptors: pelvic inflammatory disease, sexually transmitted infections and Chlamydia trachomatis.

In this review, the exclusion criteria were theses, dissertations, duplicate articles and those that deviated from the topic. In addition, complementary research was carried out in the Brazilian Protocol for Sexually Transmitted Infections and in the Department of Chronic Conditions and Sexually Transmitted Infections of the Ministry of Health.
3 RESULTS AND DISCUSSION

Pelvic inflammatory disease is an inflammatory and infectious syndrome that affects the genital tract, especially the upper part, such as the endometrium, uterine tubes, ovaries, peritoneum and adjacent structures, such as the liver, and occurs secondary to the rise of micro-lower genital tract organisms. More than 85% of infections are due to pathogenic agents of sexually transmitted infections, primarily Chlamydia trachomatis and Neisseria gonorrhoeae, which, as they are gram-negative bacteria, survive in the intra and extracellular environment, in addition to anaerobic bacteria such as S. agalactiae and H. influenzae and the vaginal flora. (MELO et al., 2021).

The occurrence of PID can occur in three ways: the lymphatic route, common in postpartum, post-abortion and in some cases after insertion of the IUD; the hematogenous route, quite rare, but related to genital tuberculosis and the ascending route, the most common, where microorganisms ascend towards the upper genital organs. (MESQUITA et al., 2020).

The passage of these agents happens through the internal orifice of the uterine cervix, once it is unprotected due to STIs, and facilitated by the perimenstrual and immediate post-menstrual period, since the cervix is open, and by the fluidity of the cervical mucus imposed by the action of estrogen. The housing of these pathogens, called stage zero or pre-PID, increases oxygen consumption and provides a site of anaerobiosis allowing the growth and development of anaerobic agents, resulting in a polymicrobial infection. (MENEZES et al. 2021).

The main risk factors that increase the likelihood of having PID are: sexual activity and its early onset, age under 25 years, multiple sexual partners, history of previous or current STIs or PID, bacterial vaginosis and use of oral contraceptive methods or devices intrauterine implants. Adolescents who are sexually active and who have multiple partners are 3 to 4 times more likely to acquire the disease, since these patients have biological factors and behaviors that favor its appearance, such as the low prevalence of antibodies against chlamydia. People with mycoplasma infection, chlamydia or a history of bacterial vaginosis are more likely to develop PID. (RIBEIRO et al., 2022).

The choice of contraceptive method is also of great importance when it comes to the risk of acquiring the disease, oral contraceptives can decrease the perception of the need to use condoms and increase the risk of acquiring an STI, and IUDs are related to PID due to manipulation of the cervical canal and endometrium, as well as endometrial biopsy and curettage, decreasing defense mechanisms and increasing the risk of developing inflammation by 3 to 5 times. The manifestations of the disease can be acute, caused mainly by STIs, chronic, by Mycobacterium tuberculosis, responsible for bacterial vaginosis, or subclinical, when there
is no previous history of PID or STIs, being the vast majority of cases and justifying the high underreporting. (SCHEER et al., 2021).

Clinical diagnosis, based on anamnesis, physical examination, mainly pelvic bimanual examination and Papanicolaou, remains the most important way to identify the disease, even though there is a wide variety of signs and symptoms, ranging from patients with mild and nonspecific manifestations or even asymptomatic, which makes it difficult to identify and treat PID. The most common complaints are pelvic pain, fever, dyspareunia, abnormal vaginal bleeding, vaginal discharge and frequency of urination. (KRZYUY et al., 2021).

To facilitate the diagnosis, the Ministry of Health divides the symptoms into major, minor and elaborate criteria, with 3 major criteria added to 1 minor, or the presence of 1 elaborate for pelvic inflammatory disease to be confirmed, as can be seen in Figure 1. (BRASIL, 2020).

Figure 1: DIP diagnostic criteria

<table>
<thead>
<tr>
<th>MAJOR CRITERIA</th>
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<tr>
<td>- Pain in the hypogastric</td>
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<td>- Pain on appendages palpation</td>
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<td>- Pain on mobilization of the cervix</td>
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<th>MINOR CRITERIA</th>
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<tr>
<td>- Axillary temperature &gt;37.5°C or rectal temperature &gt;38.3°C</td>
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<tr>
<td>- Abnormal vaginal discharge or endocervical discharge</td>
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<tr>
<td>- Pelvic mass</td>
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<td>- More than five leukocytes per immersion field in endocervical material</td>
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<tr>
<td>- Leukocytosis in peripheral blood</td>
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<tr>
<td>- Elevated C-reactive protein (CRP) or erythrocyte sedimentation rate (ESR)</td>
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<tr>
<td>- Laboratory evidence of cervical infection by gonococcus, chlamydia or mycoplasma</td>
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<th>ELABORATED CRITERIA</th>
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<tr>
<td>- Histopathologic evidence of endometritis</td>
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<tr>
<td>- Presence of ovarian tube abscess or cul-de-sac of Douglas on imaging study</td>
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<tr>
<td>- Laparoscopy with evidence of PID</td>
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Source: Authors 2023

As can be seen, pain in the hypogastrium, pain on appendages palpation, and pain on mobilization of the uterine cervix are the major criteria. Axillary temperature > 37.5 °C, abnormal vaginal contents or endocervical secretion, pelvic mass, more than 5 leukocytes per field of immersion in endocervical material, peripheral blood leukocytosis, elevated CRP or
ESR, and laboratory evidence of cervical gonococcal infection, chlamydia or mycoplasma are minor criteria. Histopathological evidence of endometritis, presence of ovarian tube abscess or Douglas's cul-de-sac on imaging and laparoscopy with evidence of PID are the elaborated criteria. (BRASIL, 2020).

In addition, laboratory tests, such as a pregnancy test, urine summary and culture, and serology for HIV, syphilis and hepatitis, and imaging, where transvaginal or pelvic ultrasound is the choice, as it is a widely available and non-invasive test, help in the diagnosis of the disease, in addition to ruling out other possible causes of the symptoms, such as ectopic pregnancy, ovarian torsion, hemorrhagic or ruptured ovarian cyst, urinary tract infection and endometriosis. Lastly, laparoscopy is the gold standard for investigating salpingitis, allowing a precise and complete bacteriological investigation, but it is not indicated in mild to moderate cases of PID. This surgery classifies pelvic inflammatory disease into four degrees of complexity and assists in the therapy adopted. (KRZYUY et al., 2021).

Grade I, or mild, is endometritis and acute salpingitis without peritonitis, grade II, or moderate without abscess, acute salpingitis with peritonitis, grade III, or moderate with abscess, acute salpingitis with tubal occlusion or tubo-ovarian abscess, and grade IV, or severe, is a ruptured tubo-ovarian abscess. (CÂMARA et al., 2021).

The treatment of PID should start immediately and can be done on an outpatient basis or in a hospital, according to the clinical condition of each woman. Patients with mild conditions, without signs of pelvisperitonitis, should be treated on an outpatient basis, with broad-spectrum antibiotics to cover all the etiological agents of the disease, the association of ceftriaxone, doxycycline and metronidazole being the first line. Hospital treatment, on the other hand, is done for women with severe symptoms or high chances of complications, the use of ceftriaxone and doxycycline is the choice for patients with hospitalization criteria such as: pregnancy and absence of clinical response after 72 hours of starting oral treatment. (BRASIL, 2020).

As it is a disease whose main cause is STIs, it is important to take into account the treatment of sexual partners, including two months prior to diagnosis, being treated even if asymptomatic, sexual abstinence during treatment or for at least 30 days and the use of condoms are also valid, in addition to outpatient follow-up even after the end of medications. The importance of a prompt diagnosis and initiation of treatment is to avoid long-term sequelae such as infertility, ectopic pregnancy and chronic pelvic pain. It is important to highlight the close relationship between PID and STIs, therefore, sex education is fundamental in the treatment and prevention of the disease. The use of condoms even when using other contraceptive
methods, the treatment of the sexual partner, even if without symptoms, are ways to reduce cases and complications of PID (MESQUITA et.al., 2020).

4 CONCLUSION

Described as a clinical syndrome caused by the rise of microorganisms from the lower genital tract, PID can happen spontaneously, facilitated by hormonal actions during the menstrual period, which favors the opening of the uterine cervix, or due to manipulations in the genitals, such as IUD insertion, curettage and endometrial biopsy.

Most cases of the disease are caused by agents responsible for STIs, such as N. gonorrhoeae, responsible for about 40% of cases, or associated with bacterial vaginosis, such as M. tuberculosis. These agents also influence the manifestation of the disease, which can be acute, chronic or subclinical. The main risk factors for PID include unfavorable socioeconomic conditions, sexual activity during adolescence, multiple partners, use of contraceptives, among others. A well-detailed anamnesis and physical examination, including abdominal, speculum and bimanual examination, are essential for the diagnosis of the disease, since complaints can be diverse or often non-existent.

It is worth mentioning that complementary exams are also fundamental for the investigation and for the exclusion of other possible diseases. Women with a mild clinical picture and physical examination without signs of pelviperitonitis should be treated on an outpatient basis, with effective therapeutic regimens for all etiological agents of PID, which is why there is no recommendation for monotherapy. In more severe cases, with fever, vomiting and nausea, or by indication, such as pregnancy, follow-up should be in the hospital. The recommendation for treatment, no matter how small the suspicion, is due to the possible consequences that PID can cause, such as chronic pelvic pain, which negatively affects the lives of most women.

In view of the above, it is concluded that pelvic inflammatory disease affects young women, who have started their sexual life early, and can be caused by actions of the body itself, such as hormonal oscillation during the menstrual cycle. The disease occurs mainly due to sexually transmitted diseases, therefore, it is essential the sexual education about the importance of using contraceptive methods, condoms, risk factors for STIs and other ways to prevent conditions such as PID.
REFERENCES


