

# بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

دکتر زهراسادات ثقة الاسلامی

متخصص بیماریهای عفونی و گرمسیری

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# STD Related Infertility

- Sexually transmitted diseases (STDs) are diseases transmitted from person to person through sexual contact, and are particularly common in adults **25 years old and younger**.
- Sexually transmitted infections (STIs) are caused by bacteria or a virus that spreads in the body, leading to STDs. the totality of the evidence linking *N. gonorrhoeae* and *C. trachomatis* to infertility is compelling. However, the associations found between *M. genitalium*, *T. vaginalis* and other potential pathogens are suggestive, but far from definitive
- Some STDs, such as gonorrhea and chlamydia, can affect fertility in men and women; these often go unnoticed due to lack of symptoms, resulting in more damage.

# PID and tubal factor infertility

- PID is most often caused by the STDs gonorrhea or chlamydia when bacteria enter the reproductive system. PID causes scarring of the cervix, vagina, ovaries, fallopian tubes and uterus. If left untreated, PID can cause irreversible damage resulting in infertility.
- Problems with the fallopian tubes is a leading cause of female infertility and such problems can be caused by STDs. PID is one cause of what is called tubal factor infertility. The American Society for Reproductive Medicine (ASRM) reports that 25%–35% of female infertility is due to tubal factors. If the fallopian tubes are damaged or blocked, this can result in infertility in two ways: it can prevent sperm from reaching the egg in the fallopian tube for fertilization, and it can prevent a fertilized egg from entering the uterus to implant for pregnancy.

# Chlamydia (chlamydia trachomatis)

- Chlamydial genital infections are the **most common** bacterial sexually transmitted infections in the world. Chlamydia is passed through sexual contact and can infect both men and women. Many people who have chlamydia aren't aware of it because the disease often has **no symptoms**.
- **Young age** is the single factor most strongly associated with increased risk of chlamydial infection among sexually active females
- **Oral contraceptives may increase susceptibility** or enhance detection because of increased cervical ectopy, resulting in more exposure of susceptible endocervical cells. Alternatively, oral contraceptive use may be a surrogate marker for increased sexual activity.
- chlamydia can cause damage and scarring to the uterus or fallopian tubes if left untreated, resulting in involuntary **infertility** and **ectopic pregnancy** . The CDC reports that if chlamydia is left untreated, about 10%-15% of women will develop **PID**.

# CLINICAL MANIFESTATIONS

C. trachomatis infections can be divided into four clinical categories:

- (1) Trachoma
- (2) oculogenital diseases in adults
- (3) Perinatal infections
- (4) LGV.

Slightly **more than half** of adults with inclusion conjunctivitis have a concurrent C. trachomatis genital tract infection, although they may not have genital symptoms. In such individuals, the presumed mode of transmission is autoinoculation of the eye with infected genital secretions or, in some cases, direct inoculation from an infected partner

Chlamydia is believed to induce **chronic inflammation**, scarring, and eventual blockage of the fallopian tubes from repeated or prolonged infection

Tubal infertility and ectopic pregnancy have a strong association with serologic evidence of prior chlamydial infection, even though most women with these reproductive health issues **do not have a history of an STD or PID**

- In males, chlamydia can impact **sperm health**, contributing to male infertility. Infection of the **testis and prostate** is implicated in a **deterioration of sperm**, possibly affecting fertility. Chlamydia infections also may affect male fertility by **directly damaging the sperm**, because sperm parameters, proportion of DNA fragmentation, and acrosome reaction capacity are impaired with chlamydial infection
- Chlamydial epididymitis is often associated with **oligospermia** during the acute phase, but there are no data indicating that future fertility is impaired. In addition, epididymitis is usually unilateral, and attempts to correlate chlamydial infections with male factor infertility have been unsuccessful.

**C. trachomatis** has been proposed as a potential cofactor for human papillomavirus (**HPV**) in the development of cervical cancer.

This association has only been noted with cervical **squamous cell carcinoma** and not cervical adenocarcinoma

**C. trachomatis** and other sexually transmitted agents that produce **genital mucosal inflammation** cause increase shedding of **HIV** in genital secretions

. Chlamydia infect columnar or squamocolumnar cells; therefore, **endocervical** and not vaginal specimens should be collected. It has been estimated that one third of the specimens submitted for study in patients with suspected Chlamydia infection are inappropriate.

Nucleic acid amplification tests (**NAATs**) are the test of choice for the diagnosis of chlamydia infections

# Pregnancy Complications

C. trachomatis infections affect pregnancy outcome. In one study, women experiencing recurrent spontaneous abortions had high titers of antichlamydial IgG but negative endocervical cultures for C. trachomatis, suggesting an association between **prior or chronic C. trachomatis infection and spontaneous abortion.**

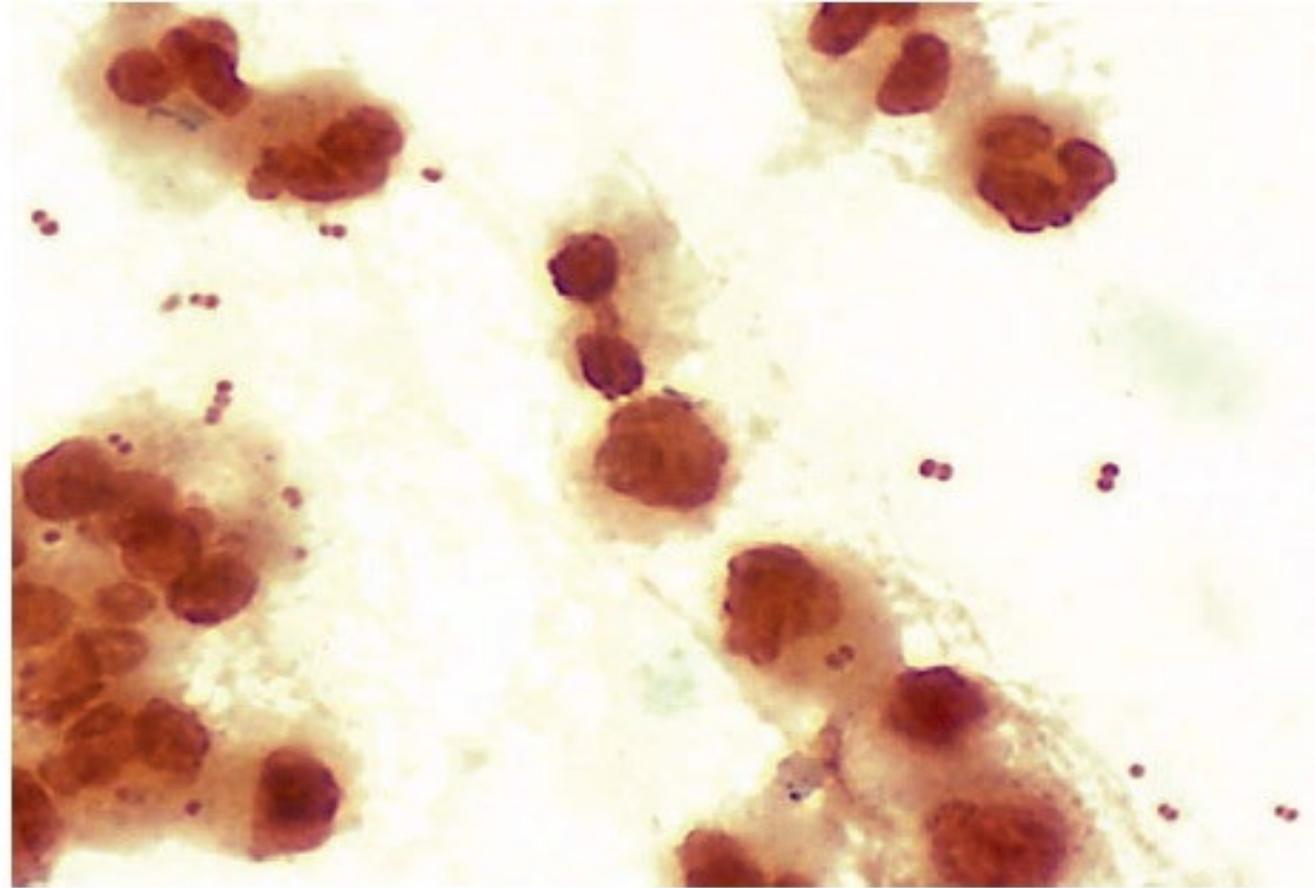
Some women with recent C. trachomatis infection had infants with **lower birth weight** compared with women lacking Chlamydia-specific IgM

An association between chlamydial infection and **prematurity** and **premature rupture of membranes** has been reported

Transmission during vaginal delivery can lead to **neonatal conjunctivitis and pneumonia**

# Lymphogranuloma Venereum

- LGV is a sexually transmitted infection caused by serovars L1, L2, and L3 of *C. trachomatis*. These serovars produce a **more invasive disease** than the genital infections caused by serovars D to K.
- The separation of enlarged femoral and inguinal nodes by the inguinal ligament produces the “**groove sign**,” which is characteristic of LGV. Inguinal or femoral lymphadenopathy may be misdiagnosed as inguinal hernia.



# Gonorrhea

- Gonorrhea can be contracted by anyone who is sexually active. Transmitted through vaginal, anal or oral sex, the prevalence of gonorrhea in young adults ages 15-24 is common because they are more sexually active. It is second only to chlamydia as the most commonly reported sexually transmitted disease in the United States
- **Without treatment, gonorrhea can lead to very serious complications in men and women.**
- Gonorrhea can thrive in a female's reproductive tract, specifically in the uterus and the fallopian tubes causing PID and tubal factor infertility.
- In males, gonorrhea can cause the sperm ducts to become inflamed, called epididymitis. If left untreated, this can cause male infertility through scarring that blocks the duct and prevents sperm from entering the female during intercourse.

Women have a **50%** risk of acquiring the infection as the result of a single exposure to an infected man, whereas men have a risk of approximately **20%** as the result of a single exposure to an infected woman.

**The major reservoir for gonococci is the asymptotically infected person.**

Asymptomatic carriage is more common in women than in men

# Gonorrhoea in Pregnancy

Gonorrhoea during pregnancy is associated with spontaneous abortion, premature labor, early rupture of fetal membranes, and perinatal infant mortality.

The risk of acquisition of *C. trachomatis* with a single episode of sexual intercourse with an infected partner has been estimated to be substantially **less than that of *N. gonorrhoeae***

**Recent exposure to a new partner was much more strongly associated with gonorrhea than with chlamydial infection**

Most individuals infected with *N. gonorrhoeae* develop symptoms and seek care quickly, but many men and most women with *C. trachomatis* are either asymptomatic or minimally symptomatic and are only diagnosed as a result of screening.

The incubation period for symptomatic chlamydial urethritis is longer, taking 7 to 14 days compared with 4 days for gonococcal urethritis. Both infections present with dysuria, but the urethral discharge with chlamydial urethritis is usually white, gray, or sometimes clear, in contrast to the more **purulent discharge** observed with **gonococcal urethritis**.

The discharge of NGU may be so slight as to be demonstrable only after penile “stripping” or “milking” and only in the morning. Some patients may deny the presence of discharge but may note stained underwear in the morning resulting from scant discharge overnight.

# Human papillomavirus (HPV)

- HPV is transferred primarily by skin-to-skin contact. HPV is a viral infection that generally causes warts on the skin and in the genital area. Treating these warts can take a long time, altering the sexual relations of a couple.
- Some strains of HPV can increase the possibility of a woman developing precancerous cells and cervical cancer. The process of removing cancerous and precancerous cells from the cervix can affect fertility. The procedures to remove these cells can change the production of cervical mucus, affecting a woman's ability to conceive. In males, some HPV types can cause persistent infection and progressively turn into genital cancers affecting fertility.

- HPV may have an impact on spermatogenesis because abnormal sperm results were more frequently found in HPV-infected men
- HPV 52 was most commonly found in the cases of low sperm concentration (oligospermia) and reduced sperm motility (asthenospermia) samples.

# Herpes simplex virus (HSV)

- HSV is a sexually transmitted infection that cause herpes. Genital herpes is most commonly caused by the type 2 virus (HSV-2) and are small blisters that appear on the genitals. If a woman with HSV becomes pregnant, passing the virus to the infant through vaginal delivery can be life threatening for the baby. HSV can have an indirect effect on fertility by causing a couple to avoid sexual contact during outbreaks, which can prolong the process of trying to conceive.
- While herpes has no impact on female fertility, herpes *can* reduce a man's sperm count. A 2013 study found that herpes was associated with **low sperm count** among men who were tested. This is the only known effect of herpes on fertility.

# HIV

HIV can impact fertility in many ways that involve biological, psychological, and social factors. **Biological changes caused by HIV, including systemic illnesses, stress, and weight loss, may affect the function of reproductive organs and result in infertility.**

Several HIV/AIDS-related comorbidities are also associated with infertility. These include orchitis, acute epididymitis, and pelvic inflammatory disease caused by opportunistic pathogens and coinfections with sexually transmitted infections (STIs) acquired through a similar route of transmission as HIV. The common STIs caused by *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, *Ureaplasma urealyticum*, *Treponema pallidum*, herpes simplex virus-2, and *Trichomonas vaginalis* can damage the reproductive system and cause infertility

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- Hypogonadism especially in men with AIDS is one of the important endocrine disorders that causes infertility. Although cART provides significant benefits in reducing morbidity and mortality among HIV-infected persons, some antiretroviral drugs, including nucleoside reverse transcriptase inhibitors, are toxic to cellular mitochondria and may affect the mitochondrial biogenesis of sperm and oocytes
- HIV-infected individuals may **have limited access to reproductive** care given the severity of their disease, cost of care, stigmatization, and lack of specific HIV infection/infertility knowledge among their providers

# Syphilis

- Syphilis is an STD caused by a bacterial infection usually spread by sexual contact. But it can also be transmitted through contact with a syphilis sore. If left untreated, mothers can also pass syphilis to their unborn babies. Women with untreated syphilis who become pregnant have a 50% chance of miscarriage or stillbirth, which has a direct impact on the ability to have a child.
- Later stages of the disease cause damage to organs and nerves, which can affect all the systems of the body, including the reproductive system.
- For men, **epididymitis** causes most syphilis-related infertility. Scarring of the sperm ducts from this condition can prevent sperm from being released during ejaculation, causing male infertility. If syphilis goes untreated for a long period of time, the disease can begin **degenerating nerves and eventually lead to erectile dysfunction.**

- The **nontreponemal tests** are used as screening tests because they are rapid to perform and inexpensive. Positive reactivity with one of these tests is **confirmed** with a **treponemal test**
- The results of treponemal tests generally remain positive for the life of the person who has syphilis
- VDRL and RPR can be used to monitor the effectiveness of therapy

# Trichomonas vaginalis

Trichomonas vaginalis is the causative agent of **trichomoniasis**, a common cause of **vaginitis**. In men, it may cause **urethritis** but is more commonly **asymptomatic**. More recently, however, recognition of the high rates of disease and of associations of trichomoniasis in women with adverse outcomes of pregnancy and increased risk for HIV infection suggest a need for increased control efforts.

# CLINICAL MANIFESTATIONS

The organisms create **microulcerations** in the genital mucosa.

In women, it is the squamous epithelium of the vagina that is infected. Symptoms in women include vaginal discharge, pruritus, and irritation. Signs of infection include vaginal discharge (42%), odor (50%), and edema or erythema (22% to 37%).

The discharge is classically described as **frothy**, but it is actually frothy in only about 10% of patients .

The color of the discharge may vary. Colpitis macularis (**strawberry cervix**) is a specific clinical sign for this infection but is detected with reliability only by colposcopy and rarely during routine examination

# COMPLICATIONS

In a large multicenter study, after adjusting for demographic, behavioral, and microbiologic variables, *T. vaginalis* was significantly associated with **low birth weight, premature rupture of membranes, and preterm delivery.**

The CDC has not revised recommendations for treatment during pregnancy.

Acquisition of HIV has been associated with trichomoniasis in several African studies, possibly as a result of the local inflammation often caused by the parasite

The associations between HIV and trichomoniasis, as well as other STDs, may relate to the following:

- (1) increased shedding of HIV as a result of the local inflammation produced by the STD
- (2) increased susceptibility to HIV as a result of the macroscopic or microscopic breaks in mucosal barriers caused by the STD
- (3) a higher prevalence of STDs among HIV-infected individuals as a result of common risk factors for both infections; and
- (4) an increased susceptibility to STDs as a result of the immunosuppression associated with HIV infection.

The RNA concentration of HIV in the seminal fluid of men with urethritis was significantly higher in men with trichomoniasis than in those with symptomatic urethritis with an unidentified cause.

In addition, successful treatment of trichomonal urethritis reduced the levels of HIV RNA so that they were similar to those seen in uninfected control subjects.

# STD treatments

## Chlamydia

- Chlamydia is caused by bacteria, which means that it can be treated with antibiotics. It is important not to have sex during treatment and to complete the full dosage of medication to ensure the infection clears up fully. Retesting three months after treatment is essential to prevent reinfection. It is often recommended to have any partners treated as well to prevent reinfection.

## Gonorrhea

- Treatment for gonorrhea includes antibiotics for both males and females. All prescribed medication should be finished, and patients should follow up with their doctor if symptoms persist. To avoid reinfection, partners of the infected person should go through testing even if they show no symptoms.

## HPV

- Although there is no cure for the virus, there are treatments available for the symptoms of infections such as genital warts, which can be treated with a prescription medication. There are also treatments for cervical pre-cancer and other HPV-related cancers. If the type of HPV found can lead to cancer, then further monitoring will be done for abnormal cell changes in the cervix. These changes may be a sign of cervical cancer and can be treated with several methods that include removing the abnormal cells.

## HSV

- There is no cure for genital herpes, yet medication is available to help reduce outbreaks. Antiviral medications can help accelerate the healing of sores and other symptoms.

## Syphilis

- In its early stages, syphilis can be treated with penicillin, an antibiotic medicine that can eradicate the organism that causes syphilis.

Primary prevention of STIs needs to be given high priority

1. Assessing risk
2. pre-exposure vaccination of individuals at risk for vaccine-preventable STIs
3. Identification of both asymptomatic and symptomatic individuals with STIs
4. Effective diagnosis, treatment, counseling and follow-up of infected individuals
5. Evaluation, treatment and counseling of sex partners of infected individuals

# Assessing risk

## Risk factors:

- .New sex partner in past 60 days
- .Multiple sex partners or a sex partner with multiple concurrent sex partners
- .Sex with partners recently treated for an STI
- .Trading sex for money or drugs
- .Sexual contact (oral,anal,penile or vaginal)with sex workers

# Risk groups

.Adolescents

.Men who have sex with men

.Patients with HIV infection

.Pregnant women

***THANKS FOR YOUR ATTENTION***

