

Research Article

# Complications of Urogenital Chlamydial Infection in Women

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## Abstract

**The objective** of the research was to identify the spectrum of complications in women with chronic urogenital chlamydial infection.

**Materials and methods.** There were examined 128 women with chronic inflammatory diseases of genital organs at the age of 16-40 years who were diagnosed with urogenital chlamydial infection and 25 apparently healthy women. In both women with chlamydial infection and healthy ones, urogenital chlamydial infection was diagnosed based on the data of clinical examination and the results of laboratory tests (the identification of chlamydial morphological structure on the pathologic specimens stained according to the Romanowsky-Giemsa method; the identification of chlamydial antigens using the direct immunofluorescence technique; the study of *Chlamydia trachomatis* antibody titers using the enzyme-linked immunosorbent assay).

**Results.** According to the results of our study, chlamydiae were the most common causes of inflammatory lesions of the urogenital organs in women of different ages leading to different reproductive complications and affecting females mostly at the age of 21-30 years. In women of Group I and Group II, chronic chlamydial disease was detected; disease duration ranged from 6 months to more than 2 years. Miscarriages, infertility (primary, secondary), ectopic pregnancy (tubal, ovarian) were the severest and the most numerous reproductive complications in the examined patients.

**Conclusion.** Chronic chlamydial infection is the most common disease of the female urinogenital organs leading to a wide spectrum of complications including infertility (primary, secondary), miscarriages, ectopic pregnancy (tubal, ovarian), chronic abdominal pain, sexual dysfunction (low libido, hypo/anorgasmia, painful intercourse, neurotic symptoms).

## Keywords

urogenital chlamydial infection; complications; infertility; miscarriages; ectopic pregnancy; chronic abdominal pain; sexual dysfunction

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## Problem statement and analysis of the latest research

Sexually transmitted infections (STIs), also referred to as sexually transmitted diseases (STDs) are common. Nowadays there are more than 20 causative agents of STDs including bacteria, viruses, yeast fungi, anthropods [2]. STDs are characterized by a relatively rapid spread among certain population groups (risk groups) and high contagiousness, thereby

requiring special measures of public health prevention [2, 11]. Clinical syndromes associated with urogenital chlamydial infection indicated that, in addition to causing local lesions of the genital mucosa and conjunctiva, chlamydia can lead to the inflammatory process in the endometrium, the fallopian tubes, the ovaries and the peritoneum via the intracanalicular spread; in rare cases, it can cause meningoencephalitis which results in severe

complications [6, 11, 14]. Chlamydial cervicitis is considered as a very common type of urogenital chlamydial infection; chlamydiae grow most frequently in the epithelium lining the cervical canal of the uterus. This pathogen is, obviously, a specific parasite of squamous and columnar epithelial cells growing in the transition zone, namely the endocervix without involving ectocervical cells [2, 12]. As chlamydial cervicitis easily affects men, sexual partners need testing as well [7, 12].

In 40-70% of women with urogenital chlamydial infection, the symptoms are not apparent. Chronic chlamydial infection affects the reproductive system. Chlamydiae are associated with impaired spermatogenesis and infertility in men, while in women, they cause adhesive and obliterative inflammation in the fallopian tubes resulting in tubal infertility [3, 10]. There are the following types of infertility: endocrine (no past genital inflammation), tubal factor and combined infertility, as well as primary (infertility in a couple who has never had a child) and secondary (failure to conceive following a previous pregnancy) infertility [1, 7]. Hormonal infertility is caused by the inability of hormone-related proteins to carry out their biological functions that results in relative hormone imbalance on the background of unchanged function of the organs secreting hormones [12, 14]. According to Pogodin O.K., chlamydial infection was found in 32.2% of women with endocrine infertility, 36.6% of females with tubal factor infertility and 51% of women with combined infertility [8, 9]. Microbial (chlamydiae and ureaplasma) association was detected in 51.4% of patients [13]. According to other authors, high titers of anti-chlamydia antibodies in men correlated with partial or total fallopian tube obstruction in their infertile wives [4, 5]. Obstructive infertility is caused by sclerotic changes in the fallopian tubes, the destruction of their epithelium and the impairment of intraorganic circulation. Some authors suggested that these pathological changes occurred due to the increase in the concentration of peptides with a molecular weight of 27 and 15 kD, as well as non-steroidal lipid activators with a molecular weight of 50 kD in the whole plasma of the fraction. Then, the stimulation of fibroblast proliferation and the

activation of DNA synthesis occurred that could result in connective tissue proliferation and weakened intercellular junctions [4, 13]. According to the authors, who studied primary and secondary infertility, among women with urogenital chlamydial infection, in 65.82% of cases, secondary infertility was diagnosed, and in 34.18% of cases, females developed primary infertility [2, 3]. Chronic active chlamydial infection led to the reduction in the reproductive function and infertility in 20 and 10% of male patients, respectively. Infertility due to inflammatory or other intoxication with the increase in pH and semen viscosity, and the decrease in sperm motility was diagnosed more often. The decrease in sperm count and the increase in the number of their pathologically altered forms were more rarely observed [2, 5]. The impairment of the male reproductive function in chlamydial infection correlated with the duration and severity of the disease, the involvement of the prostate gland, seminal vesicles and epididymis in the pathological process. Decreased semen fertility was often observed in case of the combination of chlamydial and ureaplasma infections [12, 14]. Chlamydial infection is of medical and social importance in perinatology, obstetrics and gynecology, as it affects female reproductive health and health status of newborns; being localized in the female urogenital organs, it contributes to the development of pathologies during pregnancy and causes chlamydial infection in newborns [2, 11, 15, 16].

**The objective of the research** was to identify the spectrum of complications in women with chronic urogenital chlamydial infection.

## 1. Materials and Methods

There were examined 128 women with chronic inflammatory diseases of genital organs at the age of 16-40 years who were diagnosed with urogenital chlamydial infection and 25 apparently healthy women. All the patients were divided into 2 groups depending on the method of treatment: Group I (the main group) included 64 women who were treated according to the developed method of treating complicated chlamydial infection, including a combina-

tion of a polyenzyme preparation "Wobenzym" and an antibiotic "Doxycycline", as well as a hepatoprotective agent "Darsil" and vaginal suppositories "Hravahin"; Group II included 64 females who received traditional therapy only. In both women with chlamydial infection and healthy ones, urogenital chlamydial infection was diagnosed based on the data of clinical examination and the results of laboratory tests. Clinical examination included the patients' complaints, medical and sexual history, life history, physical examination.

There were used the following methods of laboratory investigation:

1. The identification of chlamydial morphological structure on the pathologic specimens stained according to the Romanowsky-Giemsa method. The method of identifying chlamydiae in affected cells involves the detection of cytoplasmic inclusions by staining the pathogenetic agent according to the Romanowsky-Giemsa method.
2. The identification of chlamydial antigens using the direct immunofluorescence technique that relies on the use of antibodies to label a specific target antigen with a fluorescent dye (also called fluorophores or fluorochromes). The fluorophore allows visualization of the target distribution in the sample under a fluorescent microscope.
3. The study of Chlamydia trachomatis antibody titers using the enzyme-linked immunosorbent assay (ELISA) that is based on the interaction of chlamydial antigen adsorbed to the wells of polystyrene plates with serum immunoglobulin G (IgG), immunoglobulin M (IgM). The study was carried out using an analyzer and reagent kit "Chlamy Best-IgG-strip" (ELISA set, Vector-Best, Novosibirsk, Russia).

## 2. Results and Discussion

According to the results of our study, chlamydial infection was spread by sexual contact in 100% of examined patients. The pathogens are commonly found in the affected reproductive organs where they survive multiplying generally in columnar epithelial cells of the mucous membranes. According to the results of our study, chlamydiae were the most common causes of inflammatory lesions of the urogenital organs in women of different ages leading to different reproductive complications and affecting mostly females at the age of 21-30 years (Table 1).

**Table 1.** Distribution of women with urogenital chlamydial infection according to their age (n=128)

Age groups	Absolute value	Percentage, %
up to 15 years of age	-	-
16-20 years of age	13	10.16
21-30 years of age	92	71.87
31-40 years of age	23	17.97
41-50 years of age	-	-
51 years of age and older	-	-

Chronic chlamydial disease was detected in all the women of Group I and Group II: there were 17 (31.28%) females with disease duration of 6 months to 1 year, 39 (30.47%) women with disease duration of 1 to 2 years and 72 (56.25%) females with disease duration of >2 years (Table 2).

Alongside with specific urinogenital complications, non-specific complications that may be regarded as residual effects and consequences of chlamydial infection are possible. All the examined women with chronic urogenital chlamydial infection developed at least one complication (Table 3).

Miscarriages and infertility were the severest and the most numerous reproductive complications in the examined patients. Infertility is the inability of a person of reproductive age to reproduce due to impaired fertilization or implantation of a fertilized egg. There are the following types of female infertility: primary (infertility in a woman who has never

**Table 2.** Structural analysis of chronic disease duration in women with urogenital chlamydial infection (n=128)

Duration	Group I, abs. (%)	Group II, abs. (%)	Total, abs. (%)
6 months – 1 year	7 (5.47)	10 (7.81)	17 (13.28)
1 year – 2 years	17 (13.28)	22 (17.19)	39 (30.47)
>2 years	40 (31.25)	32 (25.00)	72 (56.25)

**Table 3.** Complications of urogenital chlamydial infection in women (n=128)

Complications	Incidence, abs. (%)
<b>Infertility</b>	48 (37.5)
Primary infertility	10 (7.81)
Secondary infertility	38 (29.69)
<b>Miscarriages</b>	39 (30.47)
<b>Ectopic pregnancy</b>	
Tubal	11 (8.59)
Ovarian	5 (3.91)
<b>Chronic abdominal pain</b>	25 (19.53)
<b>Sexual dysfunction</b>	
Low libido	39 (30.47)
Hypo/anorgasmia	56 (43.75)
Painful intercourse	29 (22.66)
Neurotic symptoms	56 (43.75)

had a child), secondary (the inability to become pregnant or to carry a baby to term after previously giving birth to a baby), and absolute (the absence of the possibility of becoming pregnant naturally due to birth defect, the absence of the uterus, ovaries, fallopian tubes, or surgical interventions) infertility. Infertility was diagnosed in 48 (37.5%) women with chronic urogenital chlamydial infection. Primary infertility was found in 10 (7.81%) women, and secondary infertility was seen in 38 (29.69%) women. Miscarriages were found in 39 (30.47%) females. 25 (19.53%) women suffered from chronic abdominal pain. There are the following types of ectopic

pregnancy: tubal pregnancy, ovarian pregnancy and abdominal pregnancy. Among studied women, ectopic pregnancy was diagnosed in 16 (12.5%) females: there were 11 (8.59%) women with tubal pregnancy and 5 (3.91%) women with tubal ectopic pregnancy. There was no case of abdominal pregnancy. Among women with chronic urogenital chlamydial infection, 39 (30.47%) females suffered from low libido; 56 (43.75%) women were diagnosed with hypo/anorgasmia; 29 (22.66%) women experienced pain during sexual intercourse; in 56 (43.75%) females, neurotic symptoms were observed (Table 3). When assessing libido impairment in patients, its dynamics and decrease due to the disease were the main criteria. Libido decreases probably due to the inhibitory process in the cerebral cortex that occurs in the response to changes in hormonal profile in case of ovarian inflammation, and nerve impulses from the foci of inflammation. Pain and discomfort in the genital area led to partial disactualization of sexual feeling.

The orgasm is an important criterion for female sexual life, as well as the final stage of the interaction of all the components of female copulative cycle and changes in any of them may result in its dysfunction. Due to prolonged persistent inflammatory process caused by chlamydiae, the genital segmentary component of the copulative cycle was affected resulting in impaired interaction of nerve centers with target organs responsible for orgasm. In other cases, chronic inflammation may affect the neurohumoral component of the copulative cycle. The psychic component may play an important role in orgasmic dysfunction in women with sexually transmitted diseases as well. If a man (sexual partner) spread infection to his female partner, even the idea of his past betrayals and a fear of new infection can prevent a woman from reaching orgasm. Neurotic symptoms with characteristic somatic, autonomic vascular, sensory and psycho-emotional disorders were observed in 56 (43.75%) women. In most cases, clinical and anamnestic data allowed us to consider these disorders as somatogenic neurosis. Among neurotic manifestations, neurasthenia-like syndromes and hysteria prevailed. Such women limited their sexual activity or completely refused



to have sex with their husbands (sexual partners) that resulted in their sexual dissatisfaction. Trying to save their marriage, some women hid the fact that they had experienced discomfort or pain during sexual intercourse. Among complications/residual effects of chronic urogenital chlamydial infection, abdominal adhesion is common. This is a pathological condition that is associated with the formation of adhesions in the abdominal cavity due to progressive disorganization of connective tissue. The adhesions may be focal or diffuse. Depending on the clinical course, there are acute intermittent and chronic adhesive disease. Due to the functional and anatomical features, it affects women only. The disease may result from pelvioperitonitis or perihepatitis - Fitz-Hugh-Curtis syndrome (the co-existence of acute chlamydial peritonitis and acute fibrous perihepatitis). This disorder was included in the list of complications developed; however, it was not detected.

### 3. Conclusions

Thus, chronic chlamydial infection is the most common disease of the female urogenital organs. The analysis of the results obtained indicated a wide spectrum of complications of chronic urogenital chlamydial infection in females. These complications included infertility (primary, secondary), miscarriages, ectopic pregnancy (tubal, ovarian), chronic abdominal pain, sexual dysfunction (low libido, hypo/anorgasmia, painful intercourse, neurotic symptoms). The wide spectrum of complications of chlamydial infection in women requires a special careful approach to its treatment.

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