

EPIDEMIOLOGY OF SEXUALLY TRANSMITTED INFECTIONS IN UKRAINE



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INTRODUCTION

The control of sexually transmitted infections (STI) is currently a pressing global health issue, particularly in Ukraine. More than 3 million new cases of STI are registered worldwide annually. However, experts believe that the actual overall number of STI globally comes to nearly 1 billion [1–8]. The prevalence of STI, according to the WHO, remained substantial around the world over the last decade and could not but be alarming. Syphilis, gonorrhea, trichomoniasis, chlamydial infections are the most common diseases in the world. About 200 million patients with gonorrhea, 250 million with chlamydial infection, 100 million with mycoplasma infection and nearly 60 million patients with syphilis are diagnosed yearly. Another 250 million people have other sexually transmitted infections. Almost every 6th inhabitant of the planet suffers from STI, 500 million people suffer from curable STIs every year [2, 3, 9].

Nearly 400,000 new cases of STI have been registered in Ukraine over the recent years. It puts our country one of the first in the prevalence of STI in Europe. Trichomoniasis, syphilis, gonorrhea, chlamydial infection, urogenital mycoplasma infection and AIDS are the most common diseases. In 2017 95,363 new cases of STI (223.9 per 100,000 population) were registered in Ukraine, and 2768 (6.5 per 100,000 population) of all forms of syphilis. Trichomoniasis is the most common – 45,414 new cases have been reported. The incidence of chlamydial infection in Ukraine is 43.6 per 100 thousand (18,571 cases); urogenital mycoplasma infection is 25,704 (60.4 per 100 thousand) [10, 11].

ANALYSIS OF LITERATURE DATA

The main reasons for STI cases to grow in number are: declining living standards in a considerable part of the population, unemployment, especially among young adults; spread of alcoholism and drug addiction; rise in crime and involvement of young people in criminal environment, contributing to their corruption; uncontrolled pornography and prostitution; diminishing the strengthening role of a family, increase in the number of singles, single-parent families, early onset of sexual activity; nonavailability of the governmental program for sex and family education; weakening of the governmental approach to prevention of STI, inability to deal with outdated dispensary methods; population movement due to the war in

the east; ineffectiveness of conventional methods of health education.

Rates of typical STI, or syphilis, gonorrhea and trichomoniasis to be exact, decrease slowly although remain pretty high. The incursion of syphilis into a more well-off section of the society, infecting pregnant women and, as a result, the risk of congenital syphilis makes to reconsider current anti-epidemic measures [12–15]. Cases of gonorrhea have become less common, especially in large cities. To what extent it reflects the reality is unclear. The availability of antibiotics, a great number of the popular medical literature (often primitive), interventions by pharmacists, nurses promotes self-medication. Private physicians contribute to under-reporting gonorrhea cases as well. There is the evidence that gonorrhea is still prevalent among certain groups of the population, among adolescents aged 14–17, who are actively practicing sexual intercourse. Currently, in the majority of cases gonorrhea is latent (asymptomatic) [12, 15–17].

Chlamydial infection is also common in Ukraine. It is estimated that 8–12% of the population is infected with chlamydia [10, 12]. In approximately 60% of cases the infection is not a cause of concern, right up to complications, such as pelvic inflammatory disease, ectopic pregnancy, infertility, prostatitis, epididymitis or arthritis [14, 19–22]. Few studies have estimated the economic damage of STIs to the society in Ukraine. The exact financial loss due to STI is unknown.

Data, as in the case of the US, are available regarding this. More than 12 million new cases of STI are registered in this country annually. At 1994 prices, the overall cost of STI treatment in the US is estimated at \$17 billion annually. The amount includes the overall cost of STI (except for human immunodeficiency virus HIV/AIDS) and their complications (\$10 billion), as well as the cost of sexually transmitted HIV/AIDS treatment (\$6.7 billion) [18, 20]. These data are 16 years old. The real value of a dollar and energy prices have doubled ever since.

A variety of these infections has tremendous pathogenicity and clinically progress with mild symptoms or being asymptomatic. The nonexistence of pronounced symptoms predetermines a great number of infected individuals in the population, who is not seeking medical help in time. This circumstance makes it more complicated to clarify the epidemiological situation. According to local and foreign studies focused on the ep-

idemiology of STI, the incidence is extra high in the group of working and reproductive age individuals. The age of 25–40 is a known risk factor of sexually transmitted diseases [21–23].

Clinical and epidemiological data on obstetrics and gynecology conditions in STI are represented in various studies as almost the largest section. These are mainly scientific works dedicated to tubal factor infertility and chlamydia associated ectopic pregnancy. STI diagnosis in pregnant women demands complete economic justification of the total screening of pregnant women for infectious diseases of this group. The percentage of pregnant women infected is a crucial criterion, as it determines extensively active vertical transmission of infections in the population: the majority of children (up to 85%), who recovered from a congenital infection, were identified to be considered as sickly children from then on. Rhinitis and nasopharyngitis, vulvitis, conjunctivitis, digestive diseases, otitis and pneumonia are observed in half of the children previously born with any type of a congenital infection. Research on the STI epidemiology in pregnancy is currently complicated due to the lack of mandatory screening. Different diagnostic tests, including enzyme-linked immunosorbent assay (ELISA), direct immunofluorescence antibody test (DFA), polymerase chain reaction (PCR), culture methods don't enable to integrate data, findings of antibody testing for STI in pregnant women are rarely published, although are of great value in clinical practice. This is due to the fact that detecting antibodies to the antigens related to STIs can be informative in those types and localization of an infection, when detecting a pathogen is complicated. Taking into account the probability of mixed infections, the parallel study of antiviral humoral immunity makes sense.

Regional and age-related aspects of the STI epidemiology reflect distinctions in pathogenesis variations of this STI. The assessment of the epidemiological situation in a particular region is weighty for optimizing screening programs.

Purpose of the study – to analyze of STI structure and morbidity patterns over the 2014–2019 period according to the statistics division of the MoH of Ukraine.

MATERIALS AND METHODS

Our analysis was based on data collected by the statistics division of the MoH of Ukraine on the STI incidence in the overall population, namely 15 years right up to 60 and older, female and male, the prevalence of diseases depending on the place of residence (city or village). Special attention was paid to the STI analysis in women and men of reproductive age. Data from

temporarily occupied territories of the Autonomous Republic of Crimea, Donetsk, Luhansk Oblasts and the city of Sevastopol are not available.

Statistical processing of the study results was performed using the MedStat package [24] and the statistical package EZR v.1.32 (Saitama Medical Center, Jichi Medical University, Saitama, Japan) [25].

RESULTS OF THE STUDY AND ITS DISCUSSION

It is worth noting that STI frequency in Ukraine over the period of 2014–2019 was declining with years. Epidemiological features of the STI frequency across Ukraine in 2014–2019 according to the data of the MoH of Ukraine are shown in the Table 1.

Patients with syphilis aged 18–29 prevailed in 2014–2019, 40-year-olds and older in 2019. The lowest incidence was observed in 2014 in the age group of 15–17-year-olds, thereby indicating the tendency to decrease in the number of patients from one year to another. The number of men suffering from syphilis was higher (9.76 as opposed to 7.53 in women in 2014). Syphilis was predominantly diagnosed in men aged 35–39 and older and women from 18 to 29 years. In 2015 this tendency still persisted: higher incidence of syphilis was reported in men, mostly at 35–39 years [22].

The number of patients with syphilis among men and women in 2016 came to 9.20 in contrast to 6.14. A majority of patients were aged 35–39, a minority – from 15 to 17 years. The number of patients among men and women was approximately equal (7.54 as opposed to 5.65) in 2017. The maximum number of patients was registered at 35–39 years. In 2018, the number of male patients comprised 7.18 as opposed to 4.98 in women. This tendency persisted in 2019 (7.29 in contrast to 4.74). Thus, the incidence of syphilis in the population of Ukraine declined by almost 1.5 times over the period of 5 years (2014–2019), but in accordance with the Table 2 remained considerably high at reproductive age among women and men.

A significant decrease in the frequency of this disease from 14.85 to 7.97 per 100,000, by 1.8 times should be also mentioned when analyzing data on the incidence of gonococcal infection, however, it was 2.5 and 3 times higher (37.26 and 24.12 per 100,000) in men and women of reproductive age (Table 2). Gonococcal infection is 2 times more common in men according to the data obtained.

The incidence of chlamydial infection decreased from 53.02 to 32.54 per 100,000 over the period of 2014–2019; in 2014 a high incidence was detected. During the whole period STI

Table 1. Incidence of STI in Ukrainian population in 2014–2019 (per 100,000)

STI	2014	2015	2016	2017	2018	2019
Syphilis	8.65	7.68	7.67	6.59	6.08	6.01
Gonorrhea	14.85	13.87	12.88	11.58	9.94	7.97
Chlamydial infection	53.02	46.27	42.93	39.80	37.19	32.54
Trichomoniasis	128.77	117.78	112.50	125.51	93.84	79.79
Urogenital mycoplasmosis	71.88	64.40	58.59	57.95	57.35	51.94
Total	277.17	250.00	234.57	241.43	204.40	178.25

Table 2. Incidence of STI in Ukrainian population of reproductive age in 2014–2019 (per 100,000)

STI	2014	2015	2016	2017	2018	2019
Syphilis	13.25	9.15	17.87	11.72	10.10	9.56
Gonorrhea	37.26	34.98	32.27	28.25	27.84	24.12
Chlamydial infection	143.90	124.51	117.98	104.75	105.94	95.80
Trichomoniasis	320.87	239.99	283.40	262.64	246.03	210.78
Urogenital mycoplasmosis	201.70	150.91	165.88	159.55	130.05	147.44
Total	716.98	559.54	617.40	566.91	519.96	487.70

were predominantly registered in the age group of 18–39-year-olds (143.90 in 2014 and 95.80 in 2019). Chlamydial infection is more common in men.

The incidence of trichomoniasis decreased by 1.6 times from 128.77 to 79.79 per 100,000 from 2014 to 2019. The incidence of trichomoniasis was the highest at reproductive age was 320.87 in 2014 and 210.78 in 2019. Over the years from 2014 to 2019, trichomoniasis was more common in women.

When it comes to urogenital mycoplasma infection, its frequency was also decreasing over the period of 5 years from 71.88 to 51.94 per 100,000, by 1.3 times. However, the tendency to high values of this disease persists in the population of reproductive age: 201.70 cases in 2014 as opposed to 147.44 per 100,000 and women are more likely to contract the disease.

Comparative analysis of the incidence of STI from 2014 to 2019 in men and women of reproductive age and the frequency of these diseases in the overall population of Ukraine per 100,000 offered evidence of the following (Figure).

The analysis of the age structure in patients with STI indicates a persistently high incidence among individuals of re-

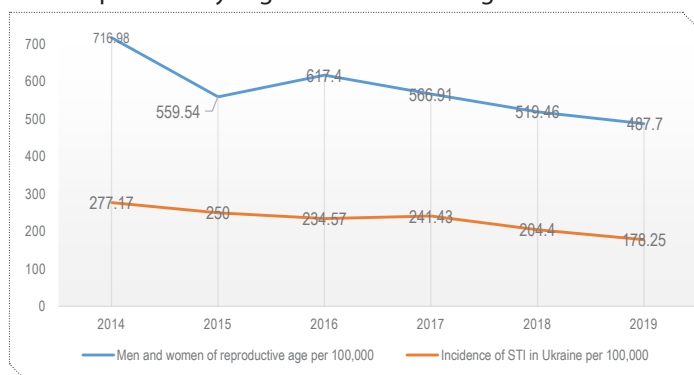


Figure. Incidence of STI in Ukraine in 2014–2019 per 100,000

Table 3. Incidence of STI in urban and rural populations (2014–2019)

STI	2014				2019			
	Urban population		Rural population		Urban population		Rural population	
	n	Per 100,000	n	Per 100,000	n	Per 100,000	n	Per 100,000
Syphilis	2384	8.1	1290	9.6	1822	5.9	664	5.1
Gonorrhea	4587	15.8	2565	8.6	2505	8.6	758	5.8
Chlamydial infection	19245	65.2	3889	25.0	11256	38.8	2561	20.5
Trichomoniasis	37082	125.7	20439	152.5	22739	78.4	12109	93.4
Urogenital mycoplasmosis	28009	94.9	3654	27.3	19509	67.2	2914	22.5
Total	91307	309.7	31837	223.0	57831	198.9	19006	147.3

productive age, which comes to 35–40%. The duration of an incubation period and symptoms of STI change as evidenced by our observations. Subclinical and asymptomatic cases, as well as mixed infection become more frequent according to the local and foreign literature [3].

Analysis of the STI distribution by social status indicated that unemployed and uneducated individuals were the majority. Persons staying in custody and unskilled labor came next. Students were of particular epidemiological significance.

According to the Table 3, we can trace the STI incidence in absolute numbers among urban and rural populations that persists in equal proportions during the last 5 years in Ukraine, namely, the urban population is 2.5–3 times more likely to suffer from STI comparing to the rural population. This tendency persisted in 2014–2019.

STI can lead to serious effects on reproductive health and even be life-threatening. They can provoke pelvic inflammatory disease, infertility (in men and women), ectopic pregnancy, unfavorable pregnancy outcomes including miscarriage, stillbirth, preterm birth and severe perinatal infections in children. STI also increase the risk of HIV infection. Most STI negatively affect reproductive health of both men and women, although the outcomes are more common and severe in women than in men.

Nowadays, STI and reproductive health concerns are inextricably linked. 40.1 thousand cases of female infertility (77.4%) and 11.8 thousand cases of male infertility (22.6%) were registered in Ukraine. The frequency of female infertility comes to 40–50%, male to 30%. According to the official information by the WHO, nearly 10% of married couples in each country suffer from infertility and STI are the cause of infertility in 30% of them [2, 12, 13].

On the one hand we can trace a decline in the STI incidence worldwide, particularly in Ukraine. The decline really takes place,

by several times as compared to 70–80 years. Hardly curable infections with unpredictable complications replaced typical STI. It concerns mycoplasma, ureaplasma, chlamydial and viral infections. And these infections, as well as people adapt to life and become resistant and incurable, which in turn leads to severe complications, also being the cause of infertility, complications from pregnancy, childbirth and neonatal conditions. If these conditions affected indirectly, did not affect at all or did not harm the fetus or pregnancy, the government would not spend so much money on prevention. STI affect not only the future progeny, they affect the health of the future wife and future husband. It should be borne in mind that only 12% of current STI are clinically apparent. Remaining of STI percent can be totally asymptomatic or latent. There is a variety of infertility causes in women, but the principal type is tubal-peritoneal factor infertility – 50–60% (typical as a result of pelvic inflammatory disease), and in men – disorders of spermatogenesis, associated with STIs, account for 30–40% [1, 13].

CONCLUSIONS

Based on this research we can conclude that the STI incidence was gradually decreasing from 2014 to 2019. STI are almost 2.5–3 times more common in locals. The analysis of the age structure in patients with STI indicates a consistently high incidence among men and women of reproductive age, which comes to 35–40%. The mean level for the STI incidence in women of reproductive age came to 20–29 years. Women aged 18–25 turned out to be the main risk groups for STI. It was mentioned that women suffer from trichomoniasis and urogenital mycoplasma infection 3–4 times more often as compared to men.

Thus, STI is a national issue facing healthcare in Ukraine. Prevention, early diagnosis and modern adequate treatment of a couple with an STI are the basic premises for a decrease in the frequency of male and female infertility.

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Purpose of the study – to analyze the structure and morbidity patterns of control of sexually transmitted infections (STI) for the period from 2014 to 2019 in accordance with data collected by the Statistical Department of the MoH of Ukraine.

Materials and methods. It was analyzed data on the STI incidence in entire population, namely from 15 years to 60 years and older, female and male, the prevalence of diseases depending on the place of residence (city or village) was performed. Particular attention is paid to the STI analysis in women and men of reproductive age. Data from the temporarily occupied territories of the Autonomous Republic of Crimea, Donetsk, Luhansk Oblasts and the city of Sevastopol are missing.

Results. The incidence of STI over 5 years (2014–2019) changed as follows: syphilis decreased by almost 1.5 times (from 8.65 to 6.01 per 100,000), but remained significantly high at reproductive age (13.25 vs. 9.56 per 100,000), men are more susceptible. Significant reduction in the incidence of gonorrhea from 14.85 to 7.97 per 100,000, by 1.8 times, but among men and women of reproductive age 2.5 and 3 times more (37.26 and 24.12 per 100,000), men are more susceptible. Cases of chlamydial infection decreased from 53.02 to 32.54 per 100,000, and were more common in the age group of 18–39 years, men are more susceptible. The incidence of trichomoniasis decreased by 1.6 times from 128.77 to 79.79 per 100,000. The incidence of trichomoniasis was the highest at reproductive age – 320.87 in 2014 and 210.78 in 2019 per 100,000, more often found in women. The incidence of urogenital mycoplasmosis also decreased over 5 years from 71.88 to 51.94 per 100,000, by 1.3 times, women are more susceptible. The urban population suffers from STI 2.5–3 times more than the rural population.

Conclusion. STI is a national health problem in Ukraine. Prevention, early diagnosis and modern adequate treatment of a couple with STI are the key to reducing the incidence of male and female infertility.

Keywords: sexually transmitted infections, population of Ukraine, reproductive age.

ЕПІДЕМІОЛОГІЯ ІНФЕКЦІЙ, ЩО ПЕРЕДАЮТЬСЯ СТАТЕВИМ ШЛЯХОМ, В УКРАЇНІ

O.I. Krotik, завідувачка відділення планування сім'ї та ДРТ з кабінетом ендокринної гінекології Клініки репродуктивних технологій УДІР НМАПО ім. П.Л. Шупика, м. Київ

Мета дослідження – провести аналіз структури та динаміки захворюваності населення України інфекціями, які передаються статевим шляхом (ІПСШ), за період з 2014 по 2019 рр. згідно з даними статистичного відділу МОЗ України.

Матеріали та методи. Було проведено аналіз даних щодо захворюваності на ІПСШ всього населення, а саме від 15 до 60 років і старше, жіночого і чоловічого, розповсюдженості захворювань згідно з місцем проживання (місто чи село). Особлива увага приділена аналізу захворюваності на ІПСШ у жінок та чоловіків репродуктивного віку. Дані з тимчасово окупованих територій АР Крим, Донецької, Луганської областей та міста Севастополя відсутні.

Результати. Частота захворюваності на ІПСШ протягом 5 років (2014–2019 рр.) змінилась таким чином: на сифіліс знизилась майже в 1,5 разу (з 8,65 до 6,01 на 100 тис. населення), але її рівень лишився високим у репродуктивному віці (13,25 проти 9,56 на 100 тис.), частіше хворіють чоловіки. Має місце значне зниження частоти захворювання на гонококову інфекцію – з 14,85 до 7,97 на 100 тис., в 1,8 разу, а серед чоловіків та жінок репродуктивного віку – в 2,5 та 3 рази більше (37,26 та 24,12 на 100 тис. відповідно), частіше хворіють чоловіки. Частота випадків хламідійної інфекції зменшилась з 53,02 до 32,54 на 100 тис., частіше вона виявлялась у віковій групі 18–39 років, частіше хворіють чоловіки. Частота випадків виявлення трихомоніазу знизилась в 1,6 разу з 128,77 до 79,79 на 100 тис. Найвища захворюваність на трихомоніаз спостерігалась в репродуктивному віці – 320,87 в 2014 р. та 210,78 в 2019 р. на 100 тис., частіше виявляється у жінок. Частота уrogenітального мікоплазмозу також знижувалась протягом 5 років із 71,88 до 51,94 на 100 тис., в 1,3 разу; частіше хворіють жінки. Міське населення хворіє на ІПСШ в 2,5–3 рази частіше порівняно з сільським.

Висновок. ІПСШ – національна проблема охорони здоров'я України. Профілактика, рання діагностика та сучасне адекватне лікування сімейної пари з ІПСШ є запорукою зниження частоти чоловічого та жіночого безпліддя.

Ключові слова: інфекції, що передаються статевим шляхом, населення України, репродуктивний вік.

ЭПИДЕМИОЛОГИЯ ИНФЕКЦИЙ, КОТОРЫЕ ПЕРЕДАЮТСЯ ПОЛОВЫМ ПУТЕМ, В УКРАИНЕ

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Цель исследования – провести анализ структуры и динамики заболеваемости инфекциями, передающимися половым путем (ИППП), за период с 2014 по 2019 гг. согласно данным статистического отдела МЗ Украины.

Материалы и методы. Проведен анализ данных относительно заболеваемости ИППП всего населения, а именно с 15 лет до 60 и старше, женского и мужского, распространенности заболеваний в зависимости от места жительства (город или село). Особое внимание уделено анализу заболеваемости ИППП у женщин и мужчин репродуктивного возраста. Данные со временно оккупированных территорий АР Крым, Донецкой, Луганской областей и города Севастополя отсутствуют.

Результаты. Частота заболеваемости ИППП в течение 5 лет (2014–2019 гг.) изменилась следующим образом: заболеваемость сифилисом снизилась почти в 1,5 раза (с 8,65 до 6,01 на 100 тыс. населения), однако ее уровень остался высоким в репродуктивном возрасте (13,25 против 9,56 на 100 тыс.), чаще болеют мужчины. Отмечено значительное снижение частоты заболевания гонококковой инфекцией с 14,85 до 7,97 на 100 тыс., в 1,8 раза, но среди мужчин и женщин репродуктивного возраста – в 2,5 и 3 раза больше (37,26 и 24,12 на 100 тыс.), чаще болеют мужчины. Частота случаев хламидийной инфекции сократилась с 53,02 до 32,54 на 100 тыс., эта инфекция чаще встречалась в возрастной группе 18–39 лет, чаще болеют мужчины. Частота выявления трихомониаза снизилась в 1,6 раза с 128,77 до 79,79 на 100 тыс. Наивысшая заболеваемость трихомониазом наблюдалась в репродуктивном возрасте – 320,87 в 2014 г. и 210,78 в 2019 г. на 100 тыс., чаще выявлялась у женщин. Частота уrogenітального мікоплазмоза также снижалась в течение 5 лет с 71,88 до 51,94 на 100 тыс., в 1,3 раза, чаще выявляется у женщин. Городское население болеет ИППП в 2,5–3 раза чаще по сравнению с сельским.

Выводы. ИППП – национальная проблема здравоохранения Украины. Профилактика, ранняя диагностика и современное адекватное лечение семейной пары с ИППП является залогом снижения частоты мужского и женского бесплодия.

Ключевые слова: инфекции, передаваемые половым путем, население Украины, репродуктивный возраст.