

KARAKTERISTIKE OBOLELIH OD GONOREJE I SIFILISA LEČENIH U GRADSKOM ZAVODU ZA KOŽNE I VENERIČNE BOLESTI U BEOGRADU 2016. I 2024. GODINE

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SAŽETAK

Uvod/Cilj: Gonoreja i sifilis su česte bakterijske polno prenosive infekcije čiji se kontinuirani porast beleži širom sveta, a objašnjava se porastom rizičnog seksualnog ponašanja, upoznavanjem seksualnih partnera preko mobilnih aplikacija, praktikovanjem hemseksa ali i češćim testiranjem na ove polne bolesti među vulnerabilnim grupama. Cilj ovog rada je bio da utvrdi da li postoje razlike u karakteristikama obolelih od gonoreje i sifilisa lečenih u Gradskom zavodu za kožne i venerične bolesti u Beogradu tokom 2016. i 2024. godine i da se identifikuju faktori koji utiču na trenutnu epidemiološku situaciju vezanu za gonoreju i sifilis.

Metode: Podaci o osnovnim demografskim karakteristikama, seksualnoj orijentaciji, HIV statusu i prethodnom obolevanju od polnih bolesti obolelih od gonoreje i sifilisa prikupljeni su iz elektronskih kartona i obrazaca za notifikaciju partnera obolelih od ovih infekcija. U statističkoj analizi podataka korišćeni su χ^2 test i studentov t-test.

Rezultati: Oboleli od gonoreje u 2024. godini, u poređenju sa obolelim osobama iz 2016. godine, su značajno češće muškarci ($p < 0,001$), neoženjeni ($p < 0,001$), sa višim stepenom obrazovanja ($p < 0,001$), zaposleni ($p < 0,001$), strani državljani ($p < 0,001$), homoseksualne orijentacije ($p < 0,001$), imali podatak o preležanoj i gonoreji i sifilisu u ličnoj anamnezi ($p < 0,001$) i dijagnozu gonoreje postavljenu uzorkovanjem sa ekstragenitalnih mesta ($p < 0,001$). Oboleli od sifilisa u 2024. godini, u poređenju sa obolelim osobama iz 2016. godine, su značajno češće neoženjeni/neudati ($p < 0,001$), sa višim stepenom obrazovanja ($p = 0,022$), zaposleni ($p < 0,001$), strani državljani ($p = 0,011$), homoseksualne orijentacije ($p = 0,001$) i imali su podatak o preležanoj i gonoreji i sifilisu u ličnoj anamnezi ($p = 0,014$).

Zaključak: Češća testiranja na gonoreju i sifilis kod muškaraca koji imaju seksualne odnose sa muškarcima u nevladinim organizacijama i u sklopu propisivanja pre ekspoziционе profilakse za HIV, savremeno dijagnostikovanje gonoreje uzorkovanjem materijala iz rektuma i farinksa, praktikovanje rizičnih seksualnih odnosa uz upotrebu hemseksa, kao i migracije izazvane ratom u Ukrajini su uticali na pojavu razlika u karakteristikama obolelih od gonoreje i sifilisa registrovanih u Beogradu u posmatranim godinama.

Ključne reči: gonoreja, sifilis, demografske karakteristike, dijagnoza, lečenje, seksualna orijentacija

Uvod

Prema procenama Svetske zdravstvene organizacije (engl. *World Health Organization* – WHO) iz 2020. godine, u svetu godišnje od gonoreje oboli 82 miliona, a od sifilisa 7,1 miliona osoba starosne dobi od 15 do 49 godina, što predstavlja porast u odnosu na procene iz 2012. godine i to za 5% za gonoreju i 26% za sifilis (1). I u Beogradu se poslednjih godina registruje porast broja novoobolelih od ove dve bakterijske polno prenosive infekci-

je. Podaci iz Beograda pokazuju da je u periodu od 2016. do 2024. godine došlo do porasta incidencije gonoreje za 229,8% (sa 4,16 na 100.000 stanovnika u 2016. godini na 9,56 na 100.000 stanovnika u 2024. godini), a incidencije sifilisa za 165,8% (sa 5,12 na 100.000 stanovnika u 2016. godini na 8,49 na 100.000 stanovnika u 2024. godini) (2, 3).

Podaci iz literature ukazuju da je veći broj faktora uticao na porast obolevanja od sifilisa i gonore-

CHARACTERISTICS OF PATIENTS WITH GONORRHEA AND SYPHILIS TREATED AT THE CITY INSTITUTE FOR SKIN AND VENEREAL DISEASES IN BELGRADE IN 2016 AND 2024

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SUMMARY

Background/Aim: Gonorrhea and syphilis are common bacterial sexually transmitted infections, with a continuous increase being recorded worldwide. This rise is explained by the increase in risky sexual behaviors, meeting sexual partners through mobile applications, engaging in chemsex, as well as more frequent testing for these sexually transmitted infections among vulnerable groups. The aim of this study was to determine whether there are differences in the characteristics of patients with gonorrhea and syphilis treated at the City Institute for Skin and Venereal Diseases in Belgrade during 2016 and 2024, and to identify factors that influence the current epidemiological situation related to gonorrhea and syphilis.

Methods: Data on basic demographic characteristics, sexual orientation, HIV status, and history of previous sexually transmitted infections among patients with gonorrhea and syphilis were collected from electronic medical records and partner notification forms of individuals diagnosed with these infections. The statistical analysis of the data was performed using the χ^2 test and Student's t-test.

Results: Patients diagnosed with gonorrhea in 2024, compared to those diagnosed in 2016, were significantly more often male ($p<0.001$), unmarried ($p<0.001$), had a higher level of education ($p<0.001$), were employed ($p<0.001$), foreign citizens ($p<0.001$), with a homosexual orientation ($p<0.001$), had a history of both gonorrhea and syphilis in their personal medical records ($p<0.001$), and were more often diagnosed with gonorrhea through sampling from extra genital sites ($p<0.001$). Patients diagnosed with syphilis in 2024, compared to those from 2016, were significantly more often unmarried ($p<0.001$), had a higher level of education ($p=0.022$), were employed ($p<0.001$), foreign citizens ($p=0.011$), with a homosexual orientation ($p=0.001$), and had a history of both gonorrhea and syphilis in their personal medical records ($p=0.014$).

Conclusion: More frequent testing for gonorrhea and syphilis among men who have sex with men, conducted by non-governmental organizations and as part of HIV pre-exposure prophylaxis programs, modern diagnostic methods for gonorrhea using samples from the rectum and pharynx, engagement in risky sexual behavior involving chemsex, as well as migration driven by the war in Ukraine, have all contributed to the observed differences in the characteristics of individuals diagnosed with gonorrhea and syphilis in Belgrade during the years under study.

Keywords: gonorrhea, syphilis, demographic characteristics, diagnosis, treatment, sexual orientation

Introduction

According to the estimates of the World Health Organization (WHO) from 2020, each year globally there are 82 million new cases of gonorrhea and 7.1 million new cases of syphilis among adults aged 15 to 49 years, which is an increase by 5% for gonorrhea and 26% for syphilis compared to the estimates from 2012 (1). An increase in the number of persons newly infected with these two bacterial sexually transmitted infections has also

been registered in Belgrade. Data from Belgrade show that from 2016 to 2024, the incidence of gonorrhea increased by 229.8% (from 4.16 per 100,000 inhabitants in 2016 to 9.56 per 100,000 inhabitants in 2024), while the incidence of syphilis increased by 165.8% (from 5.12 per 100,000 inhabitants in 2016 to 8.49 per 100,000 inhabitants in 2024) (2,3).

je u svetu u poslednjoj deceniji: lakše upoznavanje seksualnih partnera putem društvenih mreža i mobilnih aplikacija (4, 5); primena preekspozicione profilakse (PrEP) za HIV, naročito u populaciji muškaraca koji imaju seksualne odnose sa muškarcima (MSM), koja štiti od dobijanja HIV infekcije, ali ne i od ostalih polno prenosivih infekcija (6, 7); upotreba droga koje utiču na seksualno ponašanje (hemseks) tako što povećavaju intenzitet seksualnog zadovoljstva kod korisnika, ali sa druge strane potenciraju nebezbedno seksualno ponašanje – seks bez kondoma i praktikovanje grupnog seksa (8), kao i veći obuhvat testiranja na sifilis i gonoreju, naročito među vulnerabilnim grupama za polno prenosive infekcije, i primenu novog protokola za dijagnostiku gonoreje polimeraznom lančanom reakcijom – PCR metodom (engl. *Polymerase chain reaction*) koji podrazumeva uzimanje i testiranje uzoraka i sa ekstragenitalnih regija – farinksa i rektuma (9).

Cilj rada je bio da utvrdimo da li postoje razlike u karakteristikama obolelih od gonoreje i sifilisa lečenih u Gradskom zavodu za kožne i venerične bolesti u Beogradu tokom 2016. i 2024. godine i da identifikujemo faktore koji utiču na trenutnu epidemiološku situaciju vezanu za gonoreju i sifilis.

Metode

U okviru studije preseka, sprovedene prvi put 2016. i drugi put 2024. godine, analizirani su oboleli od gonoreje i sifilisa koji su tokom navedenih godina lečeni od gonoreje i sifilisa u Gradskom zavodu za kožne i venerične bolesti u Beogradu. Podaci o osnovnim demografskim karakteristikama obolelih od gonoreje i sifilisa u Gradskom zavodu za kožne i venerične bolesti u Beogradu tokom 2024. godine (pol, državljanstvo, uzrast, obrazovanje, zaposlenost i bračni status) i podaci o seksualnoj orijentaciji, HIV statusu i prethodnom obolevanju od polnih bolesti prikupljeni su iz elektronskih kartona, kao i iz obrazaca za notifikaciju partnera obolelih od sifilisa i gonoreje. Podatke o obolelima od gonoreje i sifilisa lečenih u Gradskom zavodu za kožne i venerične bolesti u Beogradu tokom 2016. godine preuzeli smo iz ranije publikovane epidemiološke studije preseka koja je proučavala razlike u seksualnom ponašanju između obolelih od gonoreje i sifilisa tokom 2016. godine (10).

Dijagnoza gonoreje postavljena je na osnovu kliničkog pregleda obolelih i laboratorijske pot-

vrde oboljenja izolovanjem Gram-negativnih intracelularnih diplokoksa iz uretre muškaraca ili endocerviksa žena i pozitivnim PCR testom na *Neisseria gonorrhoeae* sa ekstragenitalnih mesta (rektuma i/ili farinksa). Dijagnoza sifilisa postavljena je kliničkim pregledom i pozitivnim netreponemskim (*Venereal Disease Research Laboratory* - VDRL; laboratorijski test za istraživanje veneričnih bolesti) i treponemskim (*Treponema Pallidum Haemagglutination Assay* - TPHA; *Treponema Pallidum* hemaglutinacioni test) serološkim testovima za sifilis U statističkoj analizi podataka korišćeni su χ^2 test i studentov t-test.

Rezultati

U tabeli 1 prikazane su karakteristike obolelih od gonoreje u 2016. godini (140 pacijenata) i u 2024. godini (153 pacijenta), a koji su lečeni u Gradskom zavodu za kožne i venerične bolesti u Beogradu. Oboleli od gonoreje u 2024. godini, u poređenju sa obolelim osobama iz 2016. godine, su značajno češće bili muškarci ($p < 0,001$), pripadali su neoženjenim osobama ($p < 0,001$), imali su viši stepen obrazovanja ($p < 0,001$), bili su zaposlena lica ($p < 0,001$), među njima je bilo više stranih državljana ($p < 0,001$), bili su homoseksualne orijentacije ($p < 0,001$), češće su imali podatak o preležanim i gonoreji i siflisu u ličnoj anamnezi ($p < 0,001$) i češće im je dijagnoza gonoreje postavljena pozitivnim PCR testom uzorkovanim sa ekstragenitalnih mesta ($p < 0,001$). U odnosu na uzrast, podatke o polno prenosivim infekcijama u ličnoj anamnezi i HIV pozitivni status nisu uočene značajne razlike između obolelih u ove dve posmatrane godine.

Karakteristike obolelih od sifilisa lečenih u Gradskom zavodu za kožne i venerične bolesti tokom 2016. godine (138 pacijenata) i u toku 2024. godine (154 pacijenta) prikazane su u Tabeli 2. Oboleli od sifilisa u 2024. godini, u poređenju sa obolelima iz 2016. godine, su značajno češće pripadali neoženjenim/neudatim licima ($p < 0,001$), imali su viši stepen obrazovanja ($p < 0,05$), bili su zaposleni ($p < 0,001$), među njima je bilo više stranih državljana ($p = 0,011$), bili su homoseksualne orijentacije ($p = 0,001$) i češće su imali podatak o preležanoj i gonoreji i siflisu u ličnoj anamnezi ($p = 0,014$). U odnosu na uzrast, pol, podatke o polno prenosivim infekcijama u ličnoj anamnezi i HIV pozitivnom statusu nisu postojale značajne razlike među obolelima u posmatranim godinama.

Data from the literature indicate that a greater number of factors have influenced the increase in the incidence of syphilis and gonorrhea in the world in the last decade: easier meeting of sexual partners through social networks and mobile applications (4,5); the implementation of pre-exposure prophylaxis (PrEP) for HIV, especially in the population of men who have sex with men (MSM), which protects from getting HIV, but not from other sexually transmitted infections (6,7); the use of drugs that affect sexual behavior (chemsex) by increasing the intensity of sexual pleasure of the user, but on the other hand encouraging unsafe sexual behavior – sex without condoms and practicing group sex (8), as well as greater share of testing for syphilis and gonorrhea, especially among vulnerable groups for sexually transmitted infections and the application of the new protocol for the diagnosis of gonorrhea using the polymerase chain reaction (PCR) method, which involves taking and testing samples from extragenital sites – the pharynx and rectum (9).

The aim of this study was to determine whether there are differences in the characteristics of patients with gonorrhea and syphilis treated at the City Institute for Skin and Venereal Diseases in Belgrade in 2016 and 2024, and to identify factors that affect the current epidemiological situation related to gonorrhea and syphilis.

Methods

As part of the cross sectional study, which was conducted for the first time in 2016 and the second in 2024, patients with syphilis and gonorrhea, who were treated at the City Institute for Skin and Venereal Diseases in Belgrade during the mentioned years, were analyzed. Data on basic demographic characteristics of patients with gonorrhea and syphilis treated at the City Institute for Skin and Venereal Diseases in Belgrade during 2024 (sex, citizenship, age, education, marital status) and data on sexual orientation, HIV status and previous sexually transmitted diseases were collected from electronic medical records and partner notification forms of individuals diagnosed with gonorrhea and syphilis. Data on patients affected by gonorrhea and syphilis, who were treated at the City Institute for Skin and Venereal Diseases in Belgrade in 2016, were taken from the previously published epidemiological

cross-sectional study which analyzed differences in sexual behavior among patients with gonorrhea and syphilis during 2016 (10).

The diagnosis of gonorrhea was established based on the clinical examination of patients and the laboratory confirmation of disease with the isolation of Gram-negative intracellular diplococci from the urethra in men or the endocervix in women and with the PCR test for *Neisseria gonorrhoeae* from extragenital sites (rectum and/or pharynx). The diagnosis of syphilis was established using the clinical examination and positive nontreponemal (Venereal disease Research Laboratory – VDRL; laboratory test for the examination of venereal diseases) and treponemal (Treponema Pallidum Haemagglutination Assay – TPHA) serological tests for syphilis. The χ^2 test and Student's t-test were used in the statistical analysis of data.

Results

The characteristics of patients with gonorrhea in 2016 (140 patients) and in 2024 (153 patients), treated at the City Institute for Skin and Venereal Diseases in Belgrade were shown in Table 1. The patients diagnosed with gonorrhea in 2024 compared to patients in 2016 were significantly more often men ($p<0.001$), unmarried ($p<0.001$), had a higher degree of education ($p<0.001$), were employed ($p<0.001$), were more often foreign citizens ($p<0.001$), were persons with a homosexual orientation ($p<0.001$), more often had a history of both gonorrhea and syphilis in their personal medical records ($p<0.001$) and the diagnosis of gonorrhea was more often established using the positive PCR test sampled from extragenital sites ($p<0.001$). In relation to age, data on sexually transmitted infections in personal medical history and HIV status, there were no significant differences between these two observed years.

The characteristics of patients with syphilis treated at the City Institute for Skin and Venereal Diseases during 2016 (138 patients) and during 2024 (154 patients) were shown in Table 2. Patients diagnosed with syphilis in 2024, compared to patients in 2016 were more often unmarried persons ($p<0.05$), had a higher degree of education ($p<0.001$), were more often foreign citizens ($p=0.011$), were persons with a homosexual orientation ($p=0.001$) and more often had a history of both gonorrhea and syphilis in their personal

Tabela 1. Izabrane karakteristike pacijenata obolelih od gonoreje u Gradskom zavodu za kožne i venerične bolesti Beograd u 2016. i 2024. godini

Karakteristike	Oboleli od gonoreje 2016. godina N=140	Oboleli od gonoreje 2024. godina N=153	p vrednost za χ^2 test
Uzrast (AS$\pm$SD)	31,04 $\pm$ 9,77	32,79 $\pm$ 8,61	0,105*
Pol			
Muški	125 (89,3)	151 (98,7)	<0,001
Ženski	15 (10,7)	2 (1,3)	
Bračni status			
Neoženjen/neudate	114 (81,4)	148 (96,7)	<0,001
Oženjen/udate	14 (10,0)	4 (2,6)	
Razvedeni	12 (8,5)	1 (0,7)	
Udovci/Udovice	0 (0,0)	0 (0,0)	
Obrazovanje (godine školovanja)			<0,001
≤12	92 (65,7)	60 (39,2)	<0,001
>12	48 (54,3)	93 (60,8)	
Zanimanje			
Zaposlena lica	74 (52,6)	124 (81,0)	<0,001
Nezaposlena lica	42 (30,0)	6 (3,9)	
Izdržavana lica	21 (15,0)	21 (13,7)	
Penzioneri	3 (2,4)	2 (1,4)	
Državljanstvo			
Republika Srbija	140 (100,0)	134 (87,6)	<0,001
Strano	0 (0,0)	19 (12,4)	
Seksualna orijentacija			<0,001
Heteroseksualna	85 (60,7)	22 (14,4)	<0,001
Homoseksualna	47 (33,6)	131 (85,6)	
Biseksualna	8 (5,7)	0 (0)	
Polno prenosive infekcije u ličnoj anamnezi			
Gonoreja	60 (42,9)	80 (52,3)	0,106
Sifilis	31 (22,1)	39 (22,5)	0,502
Gonoreja i sifilis	6 (4,3)	14 (9,2)	0,099
HIV pozitivan status	3 (2,1)	27 (17,6)	<0,001
PCR pozitivan test na <i>Neisseria gonorrhoeae</i> sa ekstragenitalnog mesta	8 (5,7)	17 (11,1)	0,098
	0 (0,0)	47 (30,7)	<0,001

AS- aritmetička sredina; SD-standardna devijacija; *p vrednost za Studentov t-test; PCR- polimerazna lančana reakcija (engl. *Polymerase chain reaction*)

Diskusija

Gradski zavod za kožne i venerične bolesti predstavlja referentnu ustanovu za lečenje polno prenosivih infekcija u Beogradu u kojoj se registruje preko 95% novoobolelih od sifilisa i gonoreje (2,3). Porast incidencije gonoreje i sifilisa u Beogradu u periodu od 2016. do 2024. godine je u skladu sa porastom incidencije ovih oboljenja i u zemljama Evropske unije (EU). U periodu 2014-2023. godina u zemljama EU došlo je do porasta incidencije gonoreje za 321%, a sifilisa za 100% (11, 12). Najviša zabeležena stopa incidencije gonoreje

bila je u 2023. godini i iznosila je 24,8 na 100.000 stanovnika, dok je najviša stopa incidencije sifilisa takođe zabeležena u 2023. godini i iznosila je 9,9 na 100.000 stanovnika.

Prema rezultatima našeg istraživanja prema uzrastu nisu postojale značajne razlike kod obolelih od gonoreje i sifilisa u posmatranim godinama (2016. vs. 2024), a oboljenja su najčešće registrovana kod osoba uzrasta 20 do 39 godina, što je u skladu sa izveštajima o obolelima od gonoreje i sifilisa u Republici Srbiji i u zemljama EU. Prema podacima Instituta za javno zdravlje Re-

Table 1. Selected characteristics of patients with gonorrhea at City Institute for Skin and Venereal Diseases in Belgrade in 2016 and 2024.

Characteristics	Gonorrhoea cases 2016 N=140	Gonorrhoea cases 2024 N=153	p value for χ^2 test
Age (AM$\pm$SD)	31.04 $\pm$ 9.77	32.79 $\pm$ 8.61	0.105*
Gender			
Male	125 (89.3)	151 (98.7)	<0.001
Female	15 (10.7)	2 (1.3)	
Marital status			
Never married	114 (81.4)	148 (96.7)	<0.001
Married	14 (10.0)	4 (2.6)	
Divorced	12 (8.5)	1 (0.7)	
Widowed	0 (0.0)	0 (0.0)	
Education (years spent in school)			<0.001
≤ 12	92 (65.7)	60 (39.2)	
>12	48 (54.3)	93 (60.8)	
Occupation			
Employed	74 (52.6)	124 (81.0)	<0.001
Unemployed	42 (30.0)	6 (3.9)	
Supported persons	21 (15.0)	21 (13.7)	
Retired	3 (2.4)	2 (1.4)	
Citizenship			
Republic of Serbia	140 (100.0)	134 (87.6)	<0.001
Foreign	0 (0.0)	19 (12.4)	
Sexual orientation			<0.001
Heterosexual	85 (60.7)	22 (14.4)	
Homosexual	47 (33.6)	131 (85.6)	
Bisexual	8 (5.7)	0 (0)	
Sexually transmitted infections in personal history			
Gonorrhea	60 (42.9)	80 (52.3)	0.106
Syphilis	31 (22.1)	39 (22.5)	0.502
Both gonorrhea and syphili	6 (4.3)	14 (9.2)	0.099
HIV positive	3 (2.1)	27 (17.6)	<0.001
PCR positive test for <i>Neisseria gonorrhoeae</i> from an extragenital site	8 (5.7)	17 (11.1)	0.098
	0 (0.0)	47 (30.7)	<0.001

AM- arithmetic mean; SD-standard deviation; *p value for Student t-test; PCR- Polymerase chain reaction

medical records ($p=0.014$). In relation to age, sex, data on sexually transmitted infections in their personal medical history and HIV positive status, there were no significant differences between patients in the observed years.

Discussion

The City Institute for Skin and Venereal Diseases is the reference institution for the treatment of sexually transmitted infections in Belgrade, where more than 95% of new cases of syphilis and gonorrhea are registered (2,3). The increase in the incidence of gonorrhea and syphilis

in Belgrade from 2016 to 2024 is in accordance with the increase in incidence of these diseases in the countries of the European Union (EU). In the period 2014-2023, in the EU countries, the incidence of gonorrhea increased by 321%, and the incidence of syphilis by 100% (11,12). The highest recorded incidence rate of gonorrhea was in 2023 and it amounted to 24.8 per 100,000, while the highest incidence rate of syphilis was also recorded in 2023 and it amounted to 9.9 per 100,000.

According to the results of our research, there was no significant difference in relation to

Tabela 2. Izabrane karakteristike pacijenata obolelih od sifilisa u Gradskom zavodu za kožne i venerične bolesti Beograd u 2016. i 2024. godini

Karakteristike	Oboleli od gonoreje 2016. godina N=138	Oboleli od gonoreje 2024. godina N=154	p vrednost za χ^2 test
Uzrast (AS$\pm$SD)	34,03 $\pm$ 10,21	36,31 $\pm$ 11,34	0,073*
Pol			
Muški	132 (95,7)	148 (96,1)	0,845
Ženski	6 (4,3)	6 (3,9)	
Bračni status			<0,001
Neoženjen/neudate	114 (82,6)	150 (97,4)	
Oženjen/udate	14 (10,1)	4 (2,6)	
Razvedeni/	9 (6,5)	0 (0,0)	
Udovci/Udovice	1 (0,7)	0 (0,0)	
Obrazovanje (godine školovanja)			0,022
≤12	75 (54,3)	63 (40,9)	
>12	63 (45,7)	91 (59,1)	
Zanimanje			<0,001
Zaposlena lica	84 (60,9)	137 (89,0)	
Nezaposlena lica	42 (30,4)	3 (1,9)	
Izdržavana lica	8 (5,8)	10 (6,5)	
Penzioneri	4 (2,9)	4 (2,6)	
Državljanstvo			0,011
Republika Srbija	138 (100,0)	147 (95,5)	
Strano	0 (0,0)	7 (4,5)	
Seksualna orijentacija			0,001
Heteroseksualna	31 (22,5)	19 (12,3)	
Homoseksualna	95 (68,8)	132 (85,7)	
Biseksualna	12 (8,7)	3 (2,0)	
Polno prenosive infekcije u ličnoj anamnezi		65 (42,2)	0,277
Gonoreja	18 (13,0)	16 (10,4)	0,480
Sifilis	24 (17,4)	28 (18,2)	0,860
Gonoreja i sifilis	4 (2,9)	18 (11,7)	0,014
HIV pozitivan status	31 (22,5)	28 (18,2)	0,363

AS- aritmetička sredina; SD-standardna devijacija; *p vrednost za Studentov t-test;

publike Srbije u 2023. godini (13) najveće uzrasno specifične stope za gonoreju su bile u grupi od 20 do 29 godina (6,6 na 100.000) i od 30 do 39 godina (5,01 na 100.000), dok su za sifilis bile najveće od 20 do 29 godina (14,2 na 100.000) i od 30 do 39 godina (14,1 na 100.000). Podaci iz zemalja EU za 2023. godinu (11, 12) pokazuju da su najveće uzrasno specifične stope za gonoreju kod muškaraca bile u grupi 25 do 34 godina (131,1 na 100.000) i od 20 do 24 godine (126,8 na 100.000) a kod žena od 20 do 24 godina (71,7 na 100.000) i od 15 do 19 godina (33,1 na 100.000), dok su za sifilis najveće stope kod muškaraca bile u uzrasnoj grupi od 25 do 34 godina (43,1 na 100.000) i od 35 do 44 godine (35,5 na 100.000) a kod žena od 20 do 24

godine (7,5 na 100.000) i od 25 do 34 godine (6,2 na 100.000).

Oboleli od gonoreje u 2024. godini, u poređenju sa obolelim osobama iz 2016. godine, su značajno češće bili neoženjeni zaposleni muškarci sa višim stepenom obrazovanja homoseksualne orijentacije, pripadali su stranim državljanima i u ličnoj anamnezi su imali podatak o preležanoj gonoreji i sifilisu, a gonoreja im je češće dijagnostikovana PCR testom uzorkovanim sa ekstragenitalnih mesta. Prema našim rezultatima u 2024. godini MSM osobe su činile čak 86% obolelih od gonoreje, dok je njihov udeo u obolelima od gonoreje u zemljama EU u toku 2023. godine bio 58% (11). Češće obolevanje od gonoreje među MSM populacijom

Table 2. Selected characteristics of patients with syphilis at City Institute for Skin and Venereal Diseases in Belgrade in 2016 and 2024

Characteristics	Syphilis cases 2016 N=140	Syphilis cases 2024 N=153	p value for χ^2 test
Age (AM$\pm$SD)	34.03 $\pm$ 10.21	36.31 $\pm$ 11.34	0.073*
Gender			
Male	132 (95.7)	148 (96.1)	0.845
Female	6 (4.3)	6 (3.9)	
Marital status			<0.001
Never married	114 (82.6)	150 (97.4)	
Married	14 (10.1)	4 (2.6)	
Divorced	9 (6.5)	0 (0.0)	
Widowed	1 (0.7)	0 (0.0)	
Education (years spent in school)			0.022
≤ 12	75 (54.3)	63 (40.9)	
>12	63 (45.7)	91 (59.1)	
Occupation			<0.001
Employed	84 (60.9)	137 (89.0)	
Unemployed	42 (30.4)	3 (1.9)	
Supported persons	8 (5.8)	10 (6.5)	
Retired	4 (2.9)	4 (2.6)	
Citizenship			0.011
Republic of Serbia	138 (100.0)	147 (95.5)	
Foreign	0 (0.0)	7 (4.5)	
Sexual orientation			0.001
Heterosexual	31 (22.5)	19 (12.3)	
Homosexual	95 (68.8)	132 (85.7)	
Bisexual	12 (8.7)	3 (2.0)	
Sexually transmitted infections in personal history		65 (42.2)	0.277
Gonorrhea	67 (48.6)		
Syphilis	18 (13.0)	16 (10.4)	0.480
Both gonorrhea and syphili	24 (17.4)	28 (18.2)	0.860
HIV positive	4 (2.9)	18 (11.7)	0.014
	31 (22.5)	28 (18.2)	0.363

AS- aritmetička sredina; SD-standardna devijacija; *p vrednost za Studentov t-test;

age between patients affected by gonorrhea and syphilis in the observed years (2016 vs. 2024), while these diseases were most often registered in persons aged 20 to 39, which is in accordance with reports on patients diagnosed with gonorrhea and syphilis in the Republic of Serbia and EU countries. According to the data of the Institute of Public Health of the Republic of Serbia in 2023 (13), the highest age-specific rates for gonorrhea were in the age group 20 to 29 years (6.6 per 100,000) and in the group 30 to 39 years (5.01 per 100,000), while the highest rates for syphilis were in the age group 20 to 29 (14.2 per 100,000) and in the group 30 to 39 (14.1 per 100,000). Data from the EU countries for the year 2023 (11,12) show that the

highest age-specific rates for gonorrhea in men were in the age group 25 to 34 years (131.1 per 100,000) and in the group 20 to 24 years (126.8 per 100,000), and in women in the age group 20 to 24 years (71.7 per 100,000) and in the group 15 to 19 years (33.1 per 100,000), while for syphilis the highest rates were in men in the age group 25 to 34 years (43.1 per 100,000) and in the group 35 to 44 years (35.5 per 100,000) and in women in the age group 20 to 24 years (7.5 per 100,000) and in the group 25 to 34 years (6.2 per 100,000).

Patients diagnosed with gonorrhea in 2024, compared to patients in 2016 were significantly more often single employed men with a higher level of education, persons with a homosexual

moglo bi se objasniti visoko rizičnim seksualnim ponašanjem, seksom sa nepoznatim osobama upoznatim preko mobilnih aplikacija, upotrebom hemseksa, ali i ekspanzijom testiranja na gonoreju zbog propisivanja PrEP-a za HIV, kao i uzorkovanjem materijala sa ekstragenitalnih mesta, jer su infekcije farinksa i rektuma obično asimptomatske (11). Tokom 2016. godine u Beogradu se nisu vršila testiranja na gonoreju iz farinksa i rektuma, tako da se dijagnoza gonoreje postavljala direktnom mikroskopijom (10), a tokom 2024. godine kod skoro $\frac{1}{3}$ novoobolelih dijagnoza je postavljena pozitivnim PCR testom na *Neisseria gonorrhoeae* iz rektuma i/ili farinksa. Ova testiranja se sprovode u privatnim laboratorijama i ne praktikuju se u državnim ustanovama, tako da su dostupnija zaposlenim osobama višeg stepena obrazovanja i boljeg materijalnog statusa. Nevladine organizacije koje rade sa MSM populacijom u Beogradu, svoje korisnike, a naše pacijente, upućuju na ova testiranja u okviru savetovanja za PrEP za HIV (14), a oni sa pozitivnim nalazom dolaze u Gradski zavod za kožne i venerične bolesti radi ordiniranja terapije.

Oboleli od sifilisa u 2024. godini u poređenju sa obolelim osobama iz 2016. godine su značajno češće pripadali zaposlenim neoženjenim/neudatim licima sa višim stepenom obrazovanja, a među njima je bilo i više stranih državljana, bili su homoseksualne orijentacije i češće su imali podatak o preležanoj i gonoreji i sifilisu u ličnoj anamnezi. Prema našim rezultatima u 2024. godini MSM osobe su činile čak 86% obolelih od sifilisa, dok je njihov udeo u obolelima od sifilisa u zemljama EU u toku 2023. godine bio 72% (12). Faktori koji utiču da se sifilis najčešće registruje u ovoj populaciji su visoko rizična seksualna ponašanja (veći broj partnera, analni seksualni odnosi bez upotrebe kondoma, upotreba hemseksa), HIV pozitivan status, upotreba PrEP-a i regularna testiranja na sifilis pre uvođenja PrEP-a za HIV prema vodiču Međunarodne unije za borbu protiv seksualno prenosivih infekcija (engl. *International union against sexually transmitted infections* – IUSTI) u Evropi (15). Prema podacima istraživanja sprovedenog u Beogradu koje je obuhvatilo 469 MSM osoba u toku 2023. godine 26,2% ispitanika je praktikovalo hemseks koji je bio povezan i sa visokorizičnim seksualnim ponašanjem i podatkom o ponavljanom obolevanju od sifilisa i gonoreje u ličnoj anamnezi (16). Rezultati ovog istraživanja takođe potvrđuju da su

oboleli od sifilisa u 2024. godini u anamnezi imali podatak o češćem obolevanju od sifilisa i gonoreje. Studija među pacijentima sa ponovnim obolevanjem od polno prenosivih infekcija rađena u Beogradu je pokazala da pored specifičnih dimenzija ličnosti ovi pacijenti praktikuju visoko rizična seksualna ponašanja (17). Praksa čestog testiranja na sifilis i HIV među MSM populacijom sprovodi se brzim testovima kod korisnika usluga nevladinih organizacija koje rade sa ovom osetljivom grupom na polno prenosive infekcije i u našoj sredini (18). U istraživanju razloga dolaska MSM osoba u jednu nevladinu organizaciju u Beogradu, čak 95% korisnika je došlo radi testiranja na sifilis i HIV, a 12,1% njih je došlo radi uvođenja PrEP-a za HIV (14). U toku 2016. godine u Beogradu nije postojala mogućnost testiranja na sifilis u nevladinim organizacijama, niti su bili dostupni lekovi za PrEP čija je upotreba podrazumevala i prethodno testiranje na sifilis.

Oboleli od sifilisa i gonoreje u 2024. godini u poređenju sa obolelima iz 2016. godine su značajno češće bili strani državljani, naime tokom 2016. godine u našoj ustanovi nisu ni registrovani strani državljani oboleli od sifilisa i/ili gonoreje. Broj stranaca koji su imigrirali u toku 2023. godine u Republici Srbiju je bio 9,5 puta veći u odnosu na 2012. godinu, a $\frac{2}{3}$ njih su činili muškarci. Najveći broj imigranata u toku 2023. godine je došao u Beograd (44%), a čak 83,5% njih je došlo iz Ruske Federacije, Narodne Republike Kine, Turske i Indije (19). U našem istraživanju preko 90% obolelih stranaca od sifilisa i gonoreje bili su Ruski državljani. Broj Ruskih državljana koji su imigrirali u Republiku Srbiju u 2023. godini bio je 47 puta veći u odnosu na 2012. godinu i 54,4% osoba su bili muškarci prosečne starosti od 30 godina (19). Studija koja se bavila istraživanjem polno prenosivih infekcija među populacijom migranata, imigranata i raseljenih lica je utvrdila da su incidencija i prevalencija HIV infekcije, hepatitisa B, hepatitisa C i sifilisa u pomenutoj populaciji bile veće u odnosu na domaće stanovništvo (20). Stigmatizacija, kulturološke i jezičke barijere, kao i teža dostupnost zdravstvenih usluga ovu populaciju čine vulnerabilnom za polno prenosive infekcije.

Zaključak

Oboleli od gonoreje i sifilisa u 2024. godini su u poređenju sa obolelima iz 2016. godine bili obrazovaniji, češće neoženjeni, zaposleni muškar-

orientation, foreign citizens and had a history of gonorrhea and syphilis, while gonorrhea was more often diagnosed using the PCR test sampled from extragenital sites. According to our results in 2024, MSM accounted for 86% of patients with gonorrhea, while their share in patients affected by gonorrhea in the EU countries in 2023 was 58% (11). The more frequent incidence of gonorrhea among the MSM population could be explained by high-risk sexual behavior, including sex with unknown persons met through mobile applications, the use of chemsex, as well as by the expansion of testing for gonorrhea due to the prescription of PrEP for HIV, and sampling the material from extragenital sites, because infections of the pharynx and rectum are usually asymptomatic (11). During 2016, tests for gonorrhea sampled from the pharynx and rectum were not performed in Belgrade, so the diagnosis of gonorrhea was established using direct microscopy (10), and in 2024, in almost ⅓ of new cases the diagnosis was established using the positive PCR test for *Neisseria gonorrhea* from the pharynx and/or rectum. These tests are conducted in private laboratories and they are not practiced in state institutions, and therefore, they are more accessible to employed persons with a higher degree of education and better financial status. Non-governmental organizations that work with the MSM population in Belgrade refer their users to these tests as part of counseling for PrEP for HIV (14), and those with a positive result come to the City Institute for Skin and Venereal Diseases in order to get the therapy.

Patients diagnosed with syphilis in 2024 compared to patients in 2016 were significantly more often employed unmarried persons with a higher degree of education, and there were more foreign citizens among them, they were persons with a homosexual orientation, and more often they had data on both gonorrhea and syphilis in their personal medical records. According to our results in 2024, MSM accounted for even 86% of patients affected by syphilis, while their share in syphilis cases in the EU countries in 2023 was 72% (12). The factors that affect the fact that syphilis is most frequently registered in this population are high-risk sexual behaviors (greater number of partners, anal sexual relations without the use of condoms, use of chemsex), HIV positive status, use of PrEP and regular testing for syphilis before the introduction of PrEP for HIV according

to the Guidelines of the International Union Against Sexually Transmitted Infections (IUSTI) in Europe (15). According to the data of the study conducted in Belgrade, which included 469 MSM persons in 2023, 26.2% of respondents practiced chemsex, which was also related to high-risk sexual behavior and information about repeated cases of syphilis and gonorrhea in the personal medical records (16). The results of this study also confirm that patients with syphilis in 2024 had a history of more frequent syphilis and gonorrhea in their personal medical records. A study which was conducted among patients with recurrent sexually transmitted infections in Belgrade showed that in addition to specific dimensions of personality, these patients practiced high-risk sexual behaviors (17). The practice of frequent testing for syphilis and HIV among the MSM population is conducted using rapid tests in users of the services of non-governmental organizations that work with this group which is vulnerable to sexually transmitted diseases in our environment (18). In a study that analyzes the reasons why MSM persons visit a non-governmental organization in Belgrade, as many as 95% of users came in order to be tested for HIV and syphilis, while 12.1% of them came in order to get PrEP for HIV (14). During 2016, there was no possibility of testing for syphilis in non-governmental organizations in Belgrade, and PrEP drugs were not available, the use of which also required previous testing for syphilis.

Patients with syphilis and gonorrhea in 2024 compared to patients in 2016 were significantly more often foreign citizens, namely, during 2016, no foreign citizens diagnosed with gonorrhea and syphilis were registered in our institution. The number of foreigners who immigrated to the Republic of Serbia in 2023 was 9.5 times higher than in 2012, and ⅔ of them were men. The largest number of immigrants came to Belgrade in 2023 (44%), and as many as 83.5% of them came from the Russian Federation, the People's Republic of China, Turkey and India (19). In our study, more than 90% of foreigners diagnosed with gonorrhea and syphilis were Russian citizens. The number of Russian citizens who immigrated to the Republic of Serbia in 2023 was 46 times higher than in 2012, and 54.4% of them were men with an average age of 30 (19). A study that dealt with the investigation of sexually transmitted infections in the population of migrants, immigrants and displaced persons

ci, lica homoseksualne orijentacije sa podatkom o prethodnom obolevanju od gonoreje i sifilisa i među njima je bilo više stranih državljana naročito iz Ruske Federacije i sa dijagnozom gonoreje postavljenom PCR testom sa ekstragenitalnih lokacija. Češća testiranja na gonoreju i sifilis kod MSM osoba u nevladinim organizacijama i u sklopu propisivanja PrEP-a, savremeno dijagnostikovanje gonoreje uzorkovanjem materijala iz rektuma i farinksa, praktikovanje rizičnih seksualnih odnosa uz upotrebu hemseksa, kao i migracije izazvane ratom u Ukrajini, su uticali na pojavu razlika u karakteristikama obolelih od gonoreje i sifilisa registrovanih u Beogradu u posmatranim godinama.

Konflikt interesa

Autor je izjavio da nema konflikta interesa.

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found that the incidence and prevalence of HIV infection, hepatitis B, hepatitis C and syphilis in the above mentioned population were higher than in the local population (20). Stigmatization, cultural and language barriers, as well as limited availability of health services make this population vulnerable to sexually transmitted infections.

Conclusion

Patients with gonorrhea and syphilis in 2024 compared to patients in 2016 were more educated, more often unmarried, employed men, persons with a homosexual orientation, with information on previous gonorrhea and syphilis and there were more foreign citizens among them, especially from the Russian Federation, with a diagnosis of gonorrhea which was established using the PCR test sampled from extragenital sites. More frequent testing for gonorrhea and syphilis among MSM in non-governmental organizations and as part of prescribing PrEP, modern diagnostic methods for gonorrhea using samples from the rectum and pharynx, engagement in risky sexual behavior involving chemsex, as well as migrations caused by the war in Ukraine have contributed to the appearance of differences in the characteristics of individuals diagnosed with gonorrhea and syphilis in Belgrade in the observed years.

Competing interests

The author declared no competing interests.

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