ORIGINALNI RAD

UDK BROJEVI:
616.972-055.34-055.1(497.11)
616.98:578.828(497.11)
DOI: https://www.doi.org/10.5937/zdravzast51-37819

PREVALENCIJA SIFILISA I HIV INFEKCIJE MEĐU MUŠKARCIMA KOJI IMAJU SEKSUALNE ODNOSE SA MUŠKARCIMA TESTIRANIM U JEDNOJ NEVLADINOJ ORGANIZACIJI U BEOGRADU

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SAŽETAK

Uvod/Cilj: U Beogradu sifilis i infekcija izazvana virusom humane imunodeficijencije (HIV) se najčešće javljaju među muškarcima koji imaju seksualne odnose sa muškarcima, koji su neretko stigmatizovani i diskriminisani, te se ne usuđuju da rade testiranja na ove bolesti u zdravstvenim ustanovama. Cilj ovog istraživanja je bio da se utvrde prevalencija sifilisa i HIV infekcije među muškarcima koji imaju seksualne odnose sa muškarcima koji su testirani u „*check-point*" centru udruženja „Potent" u Beogradu.
Metode: U ovu studiju preseka uključene su 993 osobe testirane na HIV i 860 osoba testiranih na sifilis brzim skrining testovima HEXAGON SYPHILIS i HEXAGON HIV. Rezultati brzih testova na HIV su potvrđeni pozitivnim Western-Blot testom na Infektivnoj klinici Kliničkog centra Srbije, a na sifilis pozitivnim serološkim testovima (VDRL – *Venereal Disease Research Laboratory*; laboratorijski test za istraživanje venerićnih bolesti i TPHA – *Treponema Pallidum Haemagglutination Assay; Treponema Pallidum* hemaglutacioni test) u Gradskom zavodu za kožne i venerične bolesti u Beogradu. U statističkoj analizi podataka korišćene su proporcije, procenti i χ^2 test.
Rezultati: Pozitivan test na HIV je zabeležen kod 11 (1,1%), a pozitivan test na sifilis kod 34 ispitanika (3,9%). Najmlađi novootkriveni HIV pozitivni ispitanik imao je 22 godine, a najstariji 46 godina, dok je najmlađa osoba sa pozitivnim testom na sifilis imala 19 godina, a najstarija 68.
Zaključak: Strategije testiranja na sifilis i HIV među muškarcima koji imaju seksualne odnose sa muškarcima bi trebalo da budu raznolike uključujući i testiranje u zajednici koje sprovode nevladine organizacije u saradnji sa zdravstvenim ustanovama.

Ključne reči: muškarci koji imaju seksualne odnose sa muškarcima, sifilis, HIV, brzi testovi, prevalencija

Uvod

Prema podacima Svetske zdravstvene organizacije za 2016. godinu u svetu je od neke od 4 izlečive infekcije koje se prenose seksualnim putem (hlamidijaza, trihomonijaza, gonoreja i sifilis) inficirano 376 miliona osoba, od toga procenjen broj obolelih od sifilisa je bio 6 miliona (1). Najveća prevalencija sifilisa je zabeležena među ključnim populacijama za širenje ove bolesti: seksualnim radnicama - 3,2% i muškarcima koji imaju seksualni odnos sa muškarcima (MSM) - 6% (2). Podaci iz naše zemlje ukazuju da je s početkom novog milenijuma došlo do značajnog porasta broja obolelih od sifilisa, a najveći broj inficiranih pripadao je upravo MSM populaciji (3). Najviše stope obolevanja od sifilisa u poslednjoj deceniji zabeležene su u 2018. godini kada je incidencija bila 2,93 na 100.000 stanovnika (4).

U svetu je krajem 2018. godine 38 miliona osoba živelo sa HIV infekcijom, a podaci iz Centralne Evrope, gde se nalazi i Republika Srbija ukazuju da je stopa novodijagnostikovanih osoba inficiranih HIV-om porasla u periodu od 2008. do 2017. godine za 129% (sa 1,4/100.000 u 2008. na 3,2/100.000 u 2017. godini) (5). Podaci iz naše zemlje pokazuju da su od prvog registrovanog slučaja HIV infekcije u 1984. godini pa do kraja 2018. godine registrovane 3852 osobe inficirane HIV-om, od kojih je 1967 obolelo od side (4). U toku 2018. godine u Republici Srbiji novootkriveno je 179 nosilaca anti-HIV antitela, i stopa novodi-

ORIGINAL PAPER

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PREVALENCE OF SYPHILIS AND HIV INFECTION AMONG MEN WHO HAVE SEX WITH MEN TESTED IN A NON-GOVERNMENTAL ORGANIZATION IN BELGRADE

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SUMMARY

Introduction/Aim: In Belgrade, syphilis and human immunodeficiency virus (HIV) infection most often occur among men who have sex with men who are often stigmatized and discriminated and hesitate to come to health institutions for testing for these diseases. The aim of this study was to assess prevalence of syphilis and HIV infection among men who have sex with men who were tested in the "check-point" center of the association "Potent" in Belgrade.
Methods: This cross-sectional study included 993 participants tested for HIV and 860 participans tested for syphilis by rapid screening tests HEXAGON SYPHILIS and HEXAGON HIV. The results of rapid HIV tests were confirmed by a positive Western-Blot test at the Infectious Diseases Clinic of the Clinical Center of Serbia, and for syphilis by positive serological tests (VDRL - Venereal Disease Research Laboratory and TPHA - Treponema Pallidum Haemagglutination Assay) at the City Institute for Skin and Venereal Diseases in Belgrade. Proportions, percentages and the χ^2 test were used in the statistical analysis of the data.
Results: A positive test for HIV was recorded in 11 (1.1%), and a positive test for syphilis in 34 participants (3.9%). The youngest newly diagnosed HIV positive case was 22 years old and the oldest 46 years old, while the youngest case with a positive test for syphilis was 19 years old and the oldest 68.
Conclusion: Strategies for testing for syphilis and HIV among men who have sex with men should be diverse, including community testing conducted by non-government organization in cooperation with health facilities.

Key words: men who have sex with men, syphilis, HIV, rapid tests, prevalence

Introduction

According to the data of the World Health Organization for 2016, 376 million people were infected with one of four curable sexually transmitted infections (chlamydia, trichomoniasis, gonorrhea, and syphilis), while the estimated number of new cases of syphilis was 6 million (1). The highest prevalence of syphilis was noted among key populations for the spread of this disease: female sex workers – 3.2% and men who had sex with men (MSM) – 6% (2). Data from our country indicate that at the beginning of new millennium there came to the significant increase in new cases of syphilis, while the largest number of infected belonged to the MSM population (3). The highest incidence rates of syphilis in the last decade were reported in 2018, when the incidence was 2.93 per 100,000 people (4).

Globally, 38 million people were living with HIV at the end of 2018, while data from Central Europe, where Serbia is located, indicate that the rate of new HIV diagnoses increased for 129% from 2008 to 2017 (from 1.4/100,000 in 2008 to 3.2/100,000 in 2017) (5). Data from our country show that since the first registered case of HIV infection in 1984, 3852 new cases of HIV were registered until the end of 2018, and of these 1967 people were affected by AIDS (4). During 2018, in the Republic of Serbia, there were 179 newly discovered carriers of anti-HIV antibodies, while the rate of newly diagnosed cases of HIV infection was 2.25 per 100,000 people. About 30% of patients became aware of their HIV status at the stage when AIDS was clinically manifested, while 76% of newly diagnosed cases of HIV infection

jagnostikovanih slučajeva HIV infekcije bila je 2,25 na 100.000 stanovnika. Oko 30% pacijenata je svoj HIV status saznalo u stadijumu klinički manifestne side, dok je 76% novootkrivenih slučajeva HIV infekcije pripadalo MSM populaciji (4).

U našoj sredini i sifilis i HIV infekcija se najčešće javljaju među muškarcima koji imaju seksualni odnos sa muškarcima koji su neretko stigmatizovani i diskriminisani te se ne usuđuju da se testiraju na ove bolesti u zdravstvenim ustanovama. Stoga se javlja potreba da se u okviru terenskih aktivnosti (*outreach*) i u *drop-in* centrima za MSM populaciju, a u saradnji sa zdravstvenim ustanovama, testiranja obave na njima „prihvatljivijem" terenu (6).

Cilj ovog istraživanja je bio da se utvrde prevalencija sifilisa i HIV infekcije među testiranim muškarcima koji imaju seksualni odnos sa muškarcima u „*check-point*" centru nevladinog udruženja „Potent" u Beogradu.

Metode

Istraživanje je sprovedeno u okviru projekta Ministarstva zdravlja broj 4013: „Podrška aktivnostima udruženja građana u oblasti prevencije i kontrole HIV infekcije u 2020. godini" i projekta Nacionalnog centra za seksualno i reproduktivno zdravlje „Potent" pod nazivom „Održivost usluga testiranja u zajednici i sveobuhvatna parnjačka podrška za osobe koje žive sa HIV-om u Republici Srbiji". U istraživanje su bili uključeni muškarci koji imaju seksualne odnose sa muškarcima koji su došli na dobrovoljno i poverljivo savetovanje i testiranje (DPST) na HIV i na sifilis u centar za testiranje udruženja „Potent" u Beogradu u periodu od 1. maja do 31. decembra 2020. godine.

U laboratorijskoj dijagnostici ovih oboljenja rađeni su imunohromatografski brzi skrining testovi treće generacije HEXAGON SYPHILIS i HEXAGON HIV (HUMAN GmbH) za detektovanja IgG, IgM i IgA antitela na *Treponema pallidum* za sifilis i detekciju antitela na HIV-1 i HIV-2. Senzitivnost ovog testa na HIV je 100% a specifičnost 99,9%, dok je senzitivnost testa na sifilis 99,3%, a specifičnost 99%. Testiranje je bilo sprovedeno prema preporukama proizvođača testova (7). Licencirani zdravstveni radnik je svim učesnicima istraživanja uzeo uzorak krvi iz prsta i nakon 20 minuta interpretirao rezultate. Svim ispitanicima je pruženo dobrovoljno i poverljivo savetovanje na HIV pre testiranja i nakon preuzimanja rezultata od strane tri savetnika za DPST. Svi rezultati testiranja uvođeni su u dnevne laboratorijske protokole. Rezultati brzih testova na HIV su potvrđeni pozitivnim *Western-Blot* testom na Infektivnoj klinici Kliničkog centra Srbije, a na sifilis pozitivnim serološkim testovima (VDRL – *Venereal Disease Research Laboratory* i TPHA – *Treponema Pallidum Haemagglutination Assay*) u Gradskom zavodu za kožne i venerične bolesti u Beogradu. U statističkoj analizi podataka korišćene su proporcije, procenti i χ^2 test.

Rezultati

U okviru istraživanja testirano je 993 MSM osoba na HIV i 860 na sifilis (Tabela 1). Pozitivan test na HIV je zabeležen kod 11 (1,1%), a na sifilis kod 34 ispitanika (3,9%). Najmlađi novootkriveni HIV pozitivni ispitanik imao je 22 godine a najstariji 46 godina, dok je najmlađa osoba sa pozitivnim testom na sifilis imala 19 godina, a najstarija 68.

Testirani na HIV i testirani na sifilis se nisu značajno razlikovali po uzrastu ($p > 0,05$). Značajnih razlika po uzrastu nije bilo ni između HIV pozitivnih i HIV negativnih, kao ni između onih sa pozitivnim i negativnim testom na sifilis ($p > 0,05$). Pozitivnih na sifilis je u poređenju sa pozitivnima na HIV bilo značajno više u uzrastu ≤ 29 godina ($p = 0,003$), kao i u uzrastu 30-39 godina ($p = 0,016$).

Tabela 1. Distribucija ispitanika testiranih na HIV i sifilis prema rezultatima testova i uzrastu

Uzrasne grupe	Testirani na HIV (N=993)		Testirani na sifilis (N=860)	
	Pozitivni Broj (%)	Negativni Broj (%)	Pozitivni Broj (%)	Negativni Broj (%)
≤ 29	2 (18,2)	459 (46,7)	14 (41,2)	411 (49,8)
30-39	6 (54,5)	380 (38,7)	16 (47,1)	305 (36,9)
40+	3 (27,3)	143 (14,6)	4 (11,7)	110 (13,3)
Ukupno	11 (1,1)	982 (98,9)	34 (3,9)	826 (96,1)

belonged to the MSM population (4).

In our environment, both syphilis and HIV infection appear most commonly among men who have sex with men, who are often stigmatized and discriminated, and therefore, they hesitate to come to health institutions for testing for these diseases. Therefore, the need arises to conduct testing in places which are "more acceptable" for them, within outreach activities and in drop-in centers for the MSM population (6).

The aim of this research was to determine the prevalence of syphilis and HIV infection among men who had sex with men who were tested at the check-point center of the non-governmental association "Potent" in Belgrade.

Methods

The study was conducted within the project number 4013 of the Ministry of Health: "Support to the activities of citizens' associations in the field of HIV prevention and control in 2020", and also the project of the National center for sexual and reproductive health "Potent", under the name "Sustainability of testing services in the community and the comprehensive peer support to people living with HIV in the Republic of Serbia". The study included men who had sex with men, who came for voluntary and confidential counseling and testing (VCCT) for HIV and syphilis to the center for testing of the association "Potent" in Belgrade in the period from 1st May to 31st December 2020.

Immunochromatographic 3rd generation rapid screening tests HEXAGON SYPHILIS and HEXAGON HIV (HUMAN GmbH) were done in the laboratory diagnostics of these diseases for IgG, IgM and IgA antibodies to *Treponema pallidum* for syphilis and for antibodies to HIV-1 and HIV-2. The sensitivity of this test for HIV is 100%, while its specificity is 99%, whereas the sensitivity of the test for syphilis is 99.3% and the specificity is 99%. Testing was conducted according to the recommendations of tests' manufacturers (7). A licensed healthcare worker collected a finger-stick blood sample from all participants of the study and interpreted the results after 20 minutes. All participants were offered a voluntary and confidential HIV counseling before testing and after the results were taken by three counselors for VCCT. All results of testing were introduced into daily laboratory protocols. The results of rapid HIV tests were confirmed by a positive Western-Blot test at the Infectious Diseases Clinic of the Clinical Center of Serbia, and for syphilis by positive serological tests (VDRL – Venereal Disease Research Laboratory and TPHA – Treponema Pallidum Haemagglutination Assay) at the City Institute for Skin and Venereal Diseases in Belgrade. Proportions, percentages and the χ^2 test were used in the statistical analysis of data.

Results

Within this study, 993 MSM participants were tested for HIV and 860 for syphilis (Table 1). A positive test for HIV was recorded in 11 (1.1%), and a positive test for syphilis in 34 participants (3.9%). The youngest newly diagnosed HIV positive participant was 22 years old and the oldest 46 years old, while the youngest person with a positive test for syphilis was 19 years old and the oldest 68 years old.

There was no significant difference between people tested for HIV and people tested for syphilis regarding age ($p > 0.05$). Also, there was no significant difference regarding age between HIV positive and HIV negative persons, as well as between those who had a positive and negative test for syphilis ($p > 0.05$). There were significantly more people who had a positive test for syphilis in comparison to those who had a positive test for

Table 1. Distribution of participants tested for HIV and syphilis according to testing results and age

Age groups	Tested for HIV (N=993)		Tested for syphilis (N=860)	
	Positive Number (%)	Negative Number (%)	Positive Number (%)	Negative Number (%)
≤ 29	2 (18.2)	459 (46.7)	14 (41.2)	411 (49.8)
30-39	6 (54.5)	380 (38.7)	16 (47.1)	305 (36.9)
40+	3 (27.3)	143 (14.6)	4 (11.7)	110 (13.3)
Total	11 (1.1)	982 (98.9)	34 (3.9)	826 (96.1)

Diskusija

Na globalnom nivou, procenjeno je da je kod muškaraca koji imaju seksualne odnose sa muškarcima 19 puta češća infekcija HIV-om u odnosu na opštu populaciju (8). Prevalencija sifilisa je najveća među MSM osobama koje žive sa HIV-om (9), a podaci Centara za prevenciju i kontrolu bolesti (engl. *Centers for Disease Control and Prevention* - CDC) su pokazali da čak 47% muškaraca koji praktikuju seksualne odnose sa muškarcima imaju koinfekciju sifilisa i HIV-a (10). Kombinacija ove dve bolesti je veoma opasna, jer kliničke i biološke karakteristike sifilisa olakšavaju transmisiju HIV infekcije, a nova infekcija sifilisom povećava koncentraciju HIV-a u telesnim tečnostima i smanjuje broj CD4 limfocita kod HIV-pozitivnih osoba, što povećava rizik da ljudi koji žive sa HIV-om lakše prenose virus (11). Stoga su rana identifikacija i lečenje sifilisa veoma važni i u sprečavanju prenošenja HIV infekcije.

U poslednjoj deceniji u Evropskim zemljama, kao i u našoj zemlji, sifilis se najčešće registrovao među MSM populacijom (12,13), a faktori koji doprinose pojavi ove infekcije bili su: promiskuitetno ponašanje, upotreba društvenih mreža i mobilnih aplikacija za brže nalaženje seksualnih partnera, zloupotreba psihoaktivnih supstanci, upotreba pre ekspozicione profilakse (PreP) za HIV i posledično nebezbedno seksualno ponašanje, naročito nekorišćenje kondoma za oralne seksualne odnose (14).

S obzirom na to da je MSM populacija teško dostupna javnom zdravstvenom sektoru, testiranja na sifilis i HIV u svetu se neretko sprovode u okviru „*outreach*" aktivnosti na terenu primenom brzih testova. Istraživanje sprovedeno u Nepalu među 167 muškaraca koji imaju seksualne odnose sa muškarcima je utvrdilo da je prevalencija HIV infekcije bila 5%, a novootkrivenog sifilisa 4% (15), dok je studija sprovedena u *Solt Lake County* u SAD utvrdila da je među 405 testiranih MSM osoba prevalencija sifilisa bila 3% (16).

Ovi rezultati su slični rezultatima našeg istraživanja. Naime, u Beogradu je prevalencija sifilisa među testiranim osobama bila 3,9%, a HIV infekcije 1,1%. Ako uporedimo broj novootkrivenih osoba sa sifilisom tokom ovog istraživanja sa ukupnim brojem novootkrivenih slučajeva sifilisa u Gradskom zavodu za kožne i venerične bolesti u Beogradu tokom 2020. godine (125 pacijenata), videćemo da je čak 27,2% novoobolelih pacijenata detektovano u „*check-point*" centru. Imajući u vidu da zbog COVID-19 pandemije veliki broj pacijenata nije imao pristup zdravstvenom sistemu, došlo je do značajnog porasta obolevanja od sifilisa u odnosu na prethodne dve godine (17), ⅓ novoobolelih je preko Centra za testiranje udruženja „Potent" došla do dijagnoze, a potom upućena referentnoj službi u Gradskom zavodu za kožne i venerične bolesti u Beogradu na lečenje. Prema podacima Gradskog zavoda za javno zdravlje, tokom 2020. godine je novootkriveno 33 slučaja HIV infekcije u Beogradu (18). Od tog broja 31 osoba je pripadala MSM populaciji, a jedna trećina novootkrivenih slučajeva HIV infekcije je detektovana tokom DPST-a u udruženju „Potent".

Rezultati ovog istraživanja su ohrabrujući i ukazuju na potrebu daljeg nastavka prakse testiranja posebno vulnerabilnih grupa, poput muškaraca koji imaju seksualne odnose sa muškarcima, na HIV i sifilis, na mestima gde se oni ne osećaju stigmatizovano i koja su im lako dostupna, a u okviru udruženja koja sarađuju sa zdravstvenim ustanovama.

Zaključak

Strategije testiranja na sifilis i HIV bi trebalo da budu raznolike, uključujući testiranje u zajednici u okviru projekata koje sprovode nevladine organizacije koje se bave prevencijom polno prenosivih infekcija među vulnerabilnim grupama u saradnji sa javnim zdravstvenim ustanovama, kao i testiranje na HIV infekciju u zatvorima, u ustanovama koje se bave lečenjem bolesti zavisnosti i zaštitom reproduktivnog zdravlja.

Konflikt interesa

Autor je izjavio da nema konflikta interesa.

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HIV in the age group < 29 years (p = 0.003), as well as in the age group 30-39 years (p = 0.016).

Discussion

Globally, it has been estimated that in men who have sex with men, the HIV infection is 19 times more frequent in comparison to the general population (8). The highest prevalence of syphilis is in MSM persons living with HIV (9), while data from the Centers for Disease Control and Prevention (CDC) have shown that even 47% of men, who have sex with men, have HIV and syphilis co-infection (10). The combination of these two diseases is very dangerous, because clinical and biological characteristics of syphilis facilitate the transmission of HIV infection, while the new infection with syphilis increases the concentration of HIV in body fluids and diminishes the number of CD4 lymphocytes in HIV positive persons, which increases the risk of easier transmission of virus in people living with HIV (11). Therefore, the early identification and treatment of syphilis is very important for the prevention of transmission of HIV infection, as well.

In the last decade, in European countries, as well as in our country, syphilis was most frequently registered in MSM population (12,13), while the factors that contribute to the appearance of this infection were the following: promiscuous behavior, use of social networks and phone applications to find sexual partners, abuse of psychoactive substances, use of pre-exposure prophylaxis (PrEP) for HIV and consequential unsafe sexual practices, especially non-use of condoms for oral intercourse (14).

Considering the fact that MSM population is hardly available for the public health sector, testing for syphilis and HIV are often conducted in the world within outreach activities with the help of rapid tests. In a study that was conducted in Nepal, it was found that among 167 men who had sex with men, the prevalence of HIV infection was 5%, and of syphilis 4% (15), while a study, which was conducted in the Salt Lake County in the USA, found that among 405 tested MSM persons, the prevalence of syphilis was 3% (16).

These results are in accordance with the results of our study. Namely, in Belgrade, the prevalence of syphilis among the tested persons was 3.9%, while the prevalence of HIV was 1.1%. If we compare the number of newly discovered persons with syphilis during this research with the total number of newly discovered syphilis cases at the City Institute for Skin and Venereal Diseases in Belgrade during 2020 (125 patients), we will see that even 27.2% of new cases were detected at the check-point center. Having in mind the fact that due to the COVID-19 pandemic, a large number of patients did not have access to the healthcare system, there came to the significant increase in syphilis cases in comparison to previous two years (17). 1/3 of new cases were diagnosed at the Center for testing of the association "Potent", and then they were referred to the City Institute for Skin and Venereal Diseases in Belgrade for treatment. According to the data of the Public Health Institute, during 2020, 33 new cases of HIV infection were discovered in Belgrade (18). Of that number, 31 persons belonged to the MSM population, while ⅓ of the newly discovered cases of HIV infection were detected during VCCT in "Potent" association.

The results of this study are encouraging and they point to the need of further continuation of testing for HIV and syphilis, especially in vulnerable groups such as men who have sex with men, in places where they do not feel stigmatized and which are easily available to them, within associations that cooperate with healthcare institutions.

Conclusion

Strategies for testing for syphilis and HIV should be diverse, including testing in the community within projects conducted by non-governmental organizations, which deal with the prevention of sexually transmitted infections among vulnerable groups in cooperation with public healthcare institutions, as well as testing for HIV infection in prisons, in institutions that deal with the treatment of addiction and protection of reproductive health.

Competing interests

The author declares no competing interests.

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Primljen: 12.05.2022. **Revizija:** 21.06.2022. **Prihvaćen:** 23.06.2022.

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Received: 05/12/2022 **Revised:** 06/21/2022 **Accepted:** 06/23/2022