

Awareness of chronic hepatitis B and C in men who have sex with men in Belgium: epidemiological survey and on-site screening

Marie Coessens ^{1,2}, Jeffrey Schouten,^{1,3} Tom Holvoet,^{1,3} Wim Verlinden^{1,2}

► Additional supplemental material is published online only. To view, please visit the journal online (<https://doi.org/10.1136/sextrans-2023-055912>).

¹Department of Gastroenterology and Hepatology, Vitaz, Sint-Niklaas, Belgium

²Laboratory of Experimental Medicine and Pediatrics, University of Antwerp Faculty of Medicine and Health Sciences, Wilrijk, Belgium

³Ghent University Faculty of Medicine and Health Sciences, Ghent, Belgium

Correspondence to

Dr Marie Coessens, Department of Gastroenterology and Hepatology, Vitaz, Sint-Niklaas, Belgium; marie.coessens@vitaz.be

Received 7 July 2023
Accepted 11 May 2024
Published Online First
2 July 2024



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To cite: Coessens M, Schouten J, Holvoet T, et al. *Sex Transm Infect* 2024;**100**:321–324.

ABSTRACT

Objectives To eliminate hepatitis B and C virus (HBV/HCV) as a public health threat by 2030, the WHO focuses on screening key populations, including men who have sex with men (MSM).

This study aims to assess HBV and HCV knowledge and awareness and HCV prevalence in MSM in Belgium.

Methods First, a questionnaire was designed to assess MSM's knowledge of HBV and HCV infection (disease process, vaccination, treatment and transmission routes). This questionnaire was conducted online, and by means of a tablet-based face-to-face questionnaire at the Antwerp and Belgian Pride. Second, HCV and HIV prevalence data were collected during outreach projects and office screening for sexually transmitted infections (STIs) organised by Sensoa and Exaequo, a Flemish and Walloon sexual health organisation.

Results 300 MSM completed the questionnaire (median age 36 years; 7.7% HIV+). Mean overall survey scores were low (HBV: 41.1%; HCV: 39.8%). Few participants identified all transmission routes correctly (HBV: 15%; HCV 1%).

The degree of education was significantly correlated with HBV knowledge and showed a trend towards correlation with HCV knowledge. HCV knowledge was significantly correlated with high-risk sexual behaviour.

The prevalence of HCV and HIV was 0.3% and 1.0%, respectively, in MSM attending commercial gay venues and 0% and 1.9% in MSM attending office STI screening.

Conclusions Knowledge of HBV and HCV infection in MSM is poor. More awareness campaigns are needed, focusing on frequent HCV risk factors (group sex, chemsex, receptive fisting, and sharing of anal toys and anal douching devices), especially targeting low-educated MSM. HBV vaccination of MSM requires continued attention.

The prevalence of HCV and HIV was remarkably low in commercial gay venues and may be higher in older MSM or in subcultures where risk factors coexist (eg, chemsex). The cost-effectiveness of internet-based approaches with subsequent at-home testing needs to be evaluated in the future.

BACKGROUND

Hepatitis B and C viruses (HBV and HCV) are two major pathogens that are more (HBV) or less (HCV) commonly sexually transmitted in men who have sex with men (MSM). Today, effective preventive and therapeutic measures for HBV infections exist and direct-acting antivirals (DAAs) have made

KEY MESSAGES

- ⇒ Knowledge of hepatitis B and C virus (HBV/HCV) infections among men who have sex with men (MSM) is poor.
- ⇒ Awareness campaigns for MSM need to focus on HBV vaccination, on all HCV risk factors (group sex, chemsex, receptive fisting, and sharing of anal toys and anal douching devices) and on low-educated MSM.
- ⇒ An HCV on-site screening approach in commercial gay venues was not cost-effective.

HCV infection a curable disease. However, global viral hepatitis mortality rates continued to rise in 2015.¹ Therefore, the WHO targets elimination of viral hepatitis as a public health threat by 2030, focusing on key populations including MSM.¹

In the early 2000s, there was a rapid expansion of the HCV epidemic among HIV+ MSM. The advent of DAAs has counteracted the rising HCV incidence, but ongoing sexual risk behaviour (ie, chemsex, group sex) continues to fuel the epidemic through reinfection. In essence, behavioural interventions play a key role in achieving elimination.² Therefore, this study aims to assess knowledge of HBV/HCV infections in MSM to identify potential targets for awareness campaigns. In addition, we need to assess the current state of the HCV epidemic among MSM attending commercial gay venues, as there are no large European data on this topic.

METHODS

Survey on HBV and HCV knowledge and awareness

Survey design

We used an online questionnaire (online supplemental table 1) in Dutch, taking 5–10 min to complete. Demographics were recorded, as well as the level of education (online supplemental table 2) and self-reported HIV, HBV and HCV infection. Presence of risky sexual practices (group sex, threesomes, chemsex, receptive fisting, sharing of anal toys, sharing of anal douching devices) and absolute number of sexual partners in the last 6 months were documented, as well as responses to 14 knowledge items on HBV and 15 on HCV. Correct answers to preventive questions were considered essential

for prevention of getting HBV/HCV infected (figure 1, questions in boxes).

Survey dissemination

The online questionnaire was promoted through Facebook, the website of OutTV and Sensoa (the Flemish expertise centre of sexual health), and promotional cards at the Belgian and Antwerp Gay Pride and in commercial gay clubs and saunas (from September to December 2017). Furthermore, we employed a face-to-face questionnaire using a tablet at the Belgian and Antwerp Pride (in May and August of 2018, respectively).

Prevalence study in MSM visiting commercial gay venues

Study design

We joined Sensoa in outreach projects and voluntarily tested visitors at peak times in 10 commercial gay bars and saunas in Antwerp, Brussels, Avelgem and Bekkevoort (where sex was possible) and during two editions of a gay fetish event in Antwerp (2019–2020).

Additional HCV test results were collected in cooperation with Exaequo (a Walloon non-profit sexual health organisation) during sexually transmitted infection (STI) screening in Exaequo offices and during outreach projects in commercial gay venues in Brussels and Wallonia in 2019.

During outreach projects, a team of three investigators (study team member, Sensoa/Exaequo member and volunteer) recruited MSM at random. MSM who agreed to participate completed the informed consent and performed an HCV and HIV test. During STI screening in offices, MSM presented at their own initiative.

Testing

During Sensoa's prevalence study, an oral quick test for HCV (OraQuick, rapid HCV antigen test by OraSure Technologies, Bethlehem, Pennsylvania, USA) was used. A DPP HIV 1/2 Assay on saliva (Chembio Diagnostics, Medford, New York, USA) was sampled and analysed in the laboratory of the Institute of Tropical Medicine in Antwerp. Test results were available online 3 days later.

TOYO VHC (Turkclab, Izmir, Turkey) and Multiplex HIV-1/HIV-2/Syphilis Antibody Test (INSTI, Biolytical Laboratories, Richmond, British Columbia, Canada) were used for the determination of HCV and HIV status on capillary blood by Exaequo. Tests were performed on-site and results were immediately communicated to the patient.

Statistical analysis

Statistical analysis was performed using IBM SPSS Statistics V.25.0.³ Descriptive statistics, independent t-tests and bivariate Spearman rank-order correlation coefficients were computed based on total knowledge scores (TS) and knowledge scores on prevention questions (PS). The latter was applied given that the three assumptions were met (ordinal variables, paired observations and monotonic relationship between the two variables). Missing data were not analysed. A *p* value less than 0.05 was considered statistically significant.

RESULTS

Survey on HBV and HCV knowledge and awareness

Population

300 MSM completed the questionnaire (median age 36 years; 40.3% no higher education; 7.7%, 3.7% and 2.0% self-reported HIV, HBV and HCV infection, respectively) (online supplemental table 3).

Sexual risk behaviour

The most reported sexual risk behaviours were group sex (≥ 3 partners: 24.7% including threesomes 17.7%) and chemsex

(11.0%), next to sharing anal toys (6.7%), receptive fisting (5.0%) and sharing anal douching devices (1.0%). One-third of respondents (29.3%) had sex with one partner in the last 6 months (≤ 5 partners: 56.0%; 6–10 partners: 11.3%; > 10 partners: 27.0%).

HBV and HCV knowledge items

Mean overall survey scores were low (HBV: 41.1%; HCV: 39.8%). Few participants identified all transmission routes correctly (HBV: 15%; HCV: 1%) and few participants answered all questions on prevention correctly (HBV: 42.7%; HCV: 33.3%).

Figure 1 displays the percentage of correctly answered survey questions.

Associations between scores on HBV and HCV knowledge items and influencing factors

The degree of education was significantly correlated with the total HBV knowledge scores (TS $p < 0.001$, $r_s = 0.209$; PS $p = 0.074$, $r_s = 0.107$) and showed a trend towards correlation with the HCV knowledge scores (TS $p = 0.057$, $r_s = 0.110$; PS $p = 0.052$, $r_s = 0.119$). The number of risky sexual practices (TS $p < 0.0001$, $r_s = 0.205$; PS $p = 0.002$, $r_s = 0.192$) and sexual partners (TS $p = 0.024$, $r_s = 0.131$; PS $p = 0.158$, $r_s = 0.087$) was significantly correlated with total HCV knowledge scores. MSM who reported having engaged in group sex ($p < 0.001$ (1.41–3.58)), threesomes ($p = 0.005$ (0.60–3.25)) and chemsex ($p = 0.023$ (0.18–2.46)) had higher total HCV knowledge scores (online supplemental table 4).

62% of MSM are interested in improving their knowledge, preferably online (82.3%).

Prevalence study in MSM visiting commercial gay venues

A total of 471 MSM participated in the prevalence study (online supplemental table 5). Screening visits (outreach setting, 315 MSM, median age 38 years) took place on weekdays (12.0%), Fridays (19.8%) and weekends (68.2%). At the Exaequo offices (156 MSM, median age 31 years), participants were mainly screened because of risky sexual behaviour (56.1%) or regular monitoring (41.5%) and much less often because of symptoms (0.6%).

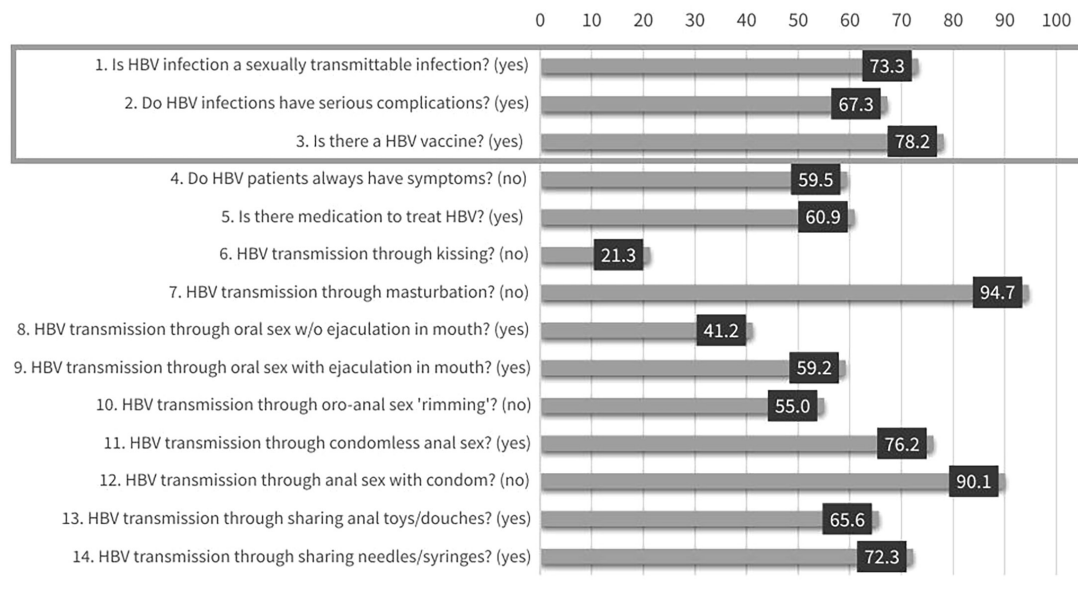
The prevalence of HCV and HIV was 0.3% and 1.0%, respectively, in MSM attending commercial gay venues and 0% and 1.9% in MSM attending office STI screening. The only positive HCV test result was from a known HIV-infected patient.

DISCUSSION

Very little research has been done on HCV awareness among MSM in the DAA era. Our data indicate that HCV awareness is still poor, as they are similar to those of a survey that was conducted among 333 MSM in Flanders in 2010.⁴ However, there is a pivotal role for behavioural interventions on the road towards elimination in the DAA era. Over one-fifth of MSM remain unaware of the HBV vaccine that has been available since 1982.

As also shown in a Dutch survey, most participants correctly identified sharing needles as an HCV transmission route, but other risk factors were far less well-known.⁵ As HCV is a bloodborne pathogen, it is well-known that direct blood exposure leads to HCV transmission. However, during group sex, a blood-contaminated penis, condom, fist or toy of an insertive partner can act as a vector for

Percentage of correctly answered survey questions on HBV



Percentage of correctly answered survey questions on HCV

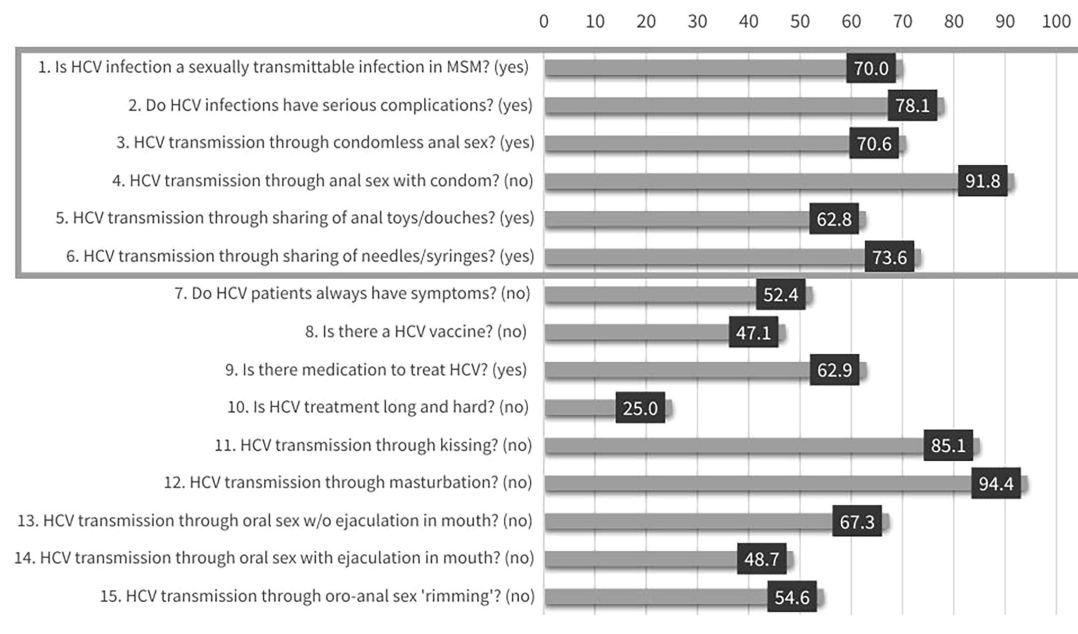


Figure 1 Percentage of correctly answered survey questions and transmission routes on HBV and HCV in a setting with two sexual partners (correct answer between brackets, preventive questions in the boxes, no weighting applied in score calculations). HBV, hepatitis B virus; HCV, hepatitis C virus; MSM, men who have sex with men.

subsequent receptive partners, and blood contact may go unnoticed.^{6,7} As we showed that many MSM engage here, we advocate that HCV awareness campaigns focus on all HCV risk factors, and not just on overt blood contact or condom use.

This study confirms a positive association between HCV knowledge and risky sexual behaviour, and between HBV and HCV knowledge and educational attainment.⁸ Therefore, awareness campaigns need to target low-educated MSM.

A time location-based HCV prevalence study among MSM in France showed higher chronic HCV prevalence (0.7% in all MSM; 3.0% in HIV+ MSM; 14.3% HIV+).⁹ Surprisingly, no new HCV cases were detected here. Possibly, MSM nowadays more often meet via internet-based partner selection.¹⁰

Every study has its limitations. As the survey was conducted in Dutch, MSM with a migrant background may be under-represented. Survey questions are simplified to be clear to

participants. An on-site screening approach may have induced selection bias. MSM already engaged in HIV clinics are less likely to participate.

CONCLUSION

In the HIV pre-exposure prophylaxis and DAA era, there is a pivotal role for behavioural interventions to prevent HCV (re) infection in MSM. Awareness campaigns are urgently needed, addressing frequent and poorly known HCV risk factors (group sex, chemsex, receptive fisting, and sharing of anal toys and anal douching devices) and targeting low-educated MSM. HBV vaccination of MSM requires continued attention.

An HCV on-site screening in MSM visiting commercial gay venues was not cost-effective. In the future, internet-based approaches with subsequent at-home testing need to be evaluated.

Handling editor Miłosz Parczewski

Acknowledgements We want to thank Lieselot Ooms and Tom Platteau (Swab2Know, Institute of Tropical Medicine Antwerp), Bart Bruyninckx (Sensoa) and Valentin Blaison (Exaequo) for their helpful assistance during the data collection.

Contributors WV designed the study and JS wrote the grant application. JS, TH and WV participated in collecting the data. MC was responsible for the data analysis and writing of the manuscript. JS, TH and WV reviewed the manuscript. WV is the principal investigator.

Funding This work was supported by Gilead Sciences and AbbVie (grant number 2017-491444).

Competing interests WV and JS have received research funding from Gilead Sciences and AbbVie. WV has been a speaker on lectures sponsored by Gilead Sciences and AbbVie. MC received a travel grant from Gilead Sciences.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by the Ethical Committee of the University Hospital Antwerp (ID ITG no. 970/14-B300201526652). Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

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ORCID iD

Marie Coessens <http://orcid.org/0000-0002-2626-3672>

REFERENCES

- 1 World Health Organization. Global hepatitis report 2017. 2017. Available: <https://www.who.int/publications-detail-redirect/global-hepatitis-report-2017> [accessed 8 Mar 2022]
- 2 van de Laar TJ, Richel O. Emerging viral Stis among HIV-positive men who have sex with men: the era of hepatitis C virus and human papillomavirus. *Sex Transm Infect* 2017;93:368–73.
- 3 IBM Corp. IBM SPSS statistics for Macintosh, version 25.0. Armonk, NY. 2017.
- 4 De Ryck I, Berghe VW, Antonneau C, et al. Awareness of hepatitis C infection among men who have sex with men in Flanders, Belgium. *Acta Clin Belg* 2011;66:46–8.
- 5 Lambers FAE, Prins M, Davidovich U, et al. High awareness of hepatitis C virus (HCV) but limited knowledge of HCV complications among HIV-positive and HIV-negative men who have sex with men. *AIDS Care* 2014;26:416–24.
- 6 Schmidt AJ, Rockstroh JK, Vogel M, et al. Trouble with bleeding: risk factors for acute hepatitis C among HIV-positive gay men from Germany—a case-control study. *PLoS One* 2011;6:e17781.
- 7 Apers L, Vanden Berghe W, De Wit S, et al. Risk factors for HCV acquisition among HIV-positive MSM in Belgium. *J Acquir Immune Defic Syndr* 2015;68:585–93.
- 8 Lea T, Hopwood M, Aggleton P. Hepatitis C knowledge among gay and other homosexually active men in Australia. *Drug Alcohol Rev* 2016;35:477–83.
- 9 Vaux S, Chevaliez S, Saboni L, et al. ANRS-Prevagay group. prevalence of hepatitis C infection, screening and associated factors among men who have sex with men attending gay Venues: a cross-sectional survey (PREVAGAY). *BMC Infect Dis* 2019;19:315.
- 10 Prinsenbergh T, Schinkel J, Zantkuij P, et al. Internet-guided HCV-RNA testing: a promising tool to achieve hepatitis C micro-elimination among men who have sex with men. *J Viral Hepat* 2022;29:677–84.

Table 1: Survey questions assessing HBV and HCV knowledge and awareness in Belgian MSM

Survey questions assessing HBV and HCV knowledge and awareness in Belgian MSM	
Is HBV/HCV infection an STI in MSM?	Yes
	No
	I don't know
Do HBV/HCV patients always have symptoms?	Yes
	No
	I don't know
Do HBV/HCV infections have serious complications?	Yes
	No
	I don't know
Is there an HBV/HCV vaccine?	Yes
	No
	I don't know
Is there medication to treat HBV/HCV?	Yes
	No
	I don't know
Is HCV treatment long and hard?	A heavy or long treatment with little chance of success
	A light and short treatment with a high chance of success
	I don't know
Which sexual practices carry a risk for HBV/HCV transmission? Several options are possible.	Kissing
	Masturbation
	Oral sex without ejaculation in the mouth
	Oral sex with ejaculation in the mouth
	Oro-anal sex ('rimming')
	Anal sex without condom
	Anal sex with condom
	Sharing anal toys/ anal shower equipment
	Sharing needles/syringes
	None of the above
I don't know	

Table 2: Coding of educational level

Educational level	Coding
1: without a diploma or primary education	1
2: lower secondary education, general (3 first years completed)	1
3: lower secondary education, technical, artistic or vocational (3 first years completed)	1
4: upper secondary education, general (6 years completed)	1
5: upper secondary, technical or artistic (6 years completed)	1
6: upper secondary, professional (6 years completed)	1
7: higher education: graduate, candidature, bachelor's degree	2
8: university education: licentiate, postgraduate, master, master after master	3
9: doctorate	3

Table 3: Characteristics of survey participants (in years and percentages)

Characteristics of survey participants		
Median age (years)		36 (29.5-45)
Residence (%)	Urban area	77
	Rural area	23
Ethnicity (%)	Caucasian	97.3
	Asian	0.3
	Mixed	2
	Other	0.3
Country of origin (%)	Belgium	83.7
	Europe (not Belgium)	15
	North America	0.7
	Asia	0.3
	South Africa	0.3
Educational level (%)	Master's degree	27.7
	Bachelor's degree	32
	No higher education	40.3

Table 4: Scores on knowledge items in MSM subgroups (TS: scores on total knowledge items, TrS: scores on transmission route questions, PS: scores on preventive questions)

	Group sex	Threesomes	Chemsex	Receptive fisting	Sharing of anal toys	Sharing of anal douching devices
TS	0.227	0.278	0.453	0.065	0.345	0.683
HBV	(-0.38 – 1.58)	(-0.52 – 1.82)	(-0.62 – 1.39)	(-0.07 – 2.23)	(-0.61 – 1.74)	(-1.18 – 1.79)
TrS	0.170	0.348	0.374	0.163	0.375	0.969
HBV	(-0.19 – 1.05)	(-0.39 – 1.10)	(-0.35 – 0.93)	(-0.21 – 1.25)	(-0.41 – 1.08)	(-0.96 – 0.93)
PS	0.122	0.027	0.578	0.007	0.176	0.09
HBV	(-0.04 – 0.38)	(0.03 – 0.54)	(-0.15 – 0.28)	(0.09 – 0.58)	(-0.08 – 0.42)	(-0.04 – 0.59)
TS	<0.001	0.005	0.023	0.081	0.109	0.108
HCV	(1.41 – 3.58)	(0.60 – 3.25)	(0.18 – 2.46)	(-0.14 – 2.49)	(-0.25 – 2.43)	(-0.31 – 3.08)
TrS	<0.001	0.003	0.028	0.133	0.135	0.256
HCV	(0.95 – 2.48)	(0.46 – 2.33)	(0.10 – 1.70)	(-0.22 – 1.64)	(-0.23 – 1.66)	(-0.50 – 1.89)
PS	<0.001	0.072	0.264	0.029	0.339	0.200
HCV	(0.34 – 1.08)	(-0.04 – 0.89)	(-0.17 – 0.61)	(0.05 – 0.94)	(-0.23 – 0.66)	(-0.20 – 0.94)

Table 5: Prevalence study

	n	Age (Median)	Belgian origin (%)	European origin (%)	HCV	HCV (%)	HIV	HIV (%)
Outreach	315	38	184 (58.8%)	284 (90.7%)	1	0.3%	3	1.0%
Outreach Sensoa	257		153	237	1		3	
Outreach Exaequo	58		31	47	0		0	
Office Exaequo	156	31	67 (43.0%)	121 (71.8%)	0	0%	3	1.9%

Abstract

Doelstellingen

Om de hepatitis B en C virus (HBV/HCV) eliminatiedoelstellingen te bereiken tegen 2030, richt de Wereldgezondheidsorganisatie zich op screening in sleutelpopulaties, waaronder mannen die seks hebben met mannen (MSM).

Deze studie onderzoekt de kennis van HBV/HCV infecties (ziekteproces, vaccinatie, behandeling en transmissieroutes) en de prevalentie van HCV infecties bij MSM in België.

Methoden

Een online vragenlijst werd gebruikt, alsook een face-to-face vragenlijst via tablet op de Antwerp Pride en Belgian Pride. Daarnaast werden HCV en HIV (humaan immunodeficiëntievirus) prevalentiegegevens verzameld door middel van SOI (seksueel overdraagbare infecties) screening in commerciële ontmoetingsplaatsen voor MSM, georganiseerd door Sensoa en Exaequo (Vlaamse en Waalse organisatie voor seksuele gezondheid) en SOI screening in Exaequo vestigingen.

Resultaten

Driehonderd MSM vulden de vragenlijst in (mediane leeftijd 36 jaar; 7,7% HIV+). Gemiddelde totaalscores waren laag (HBV: 41,1%; HCV: 39,8%). Weinig deelnemers identificeerden alle transmissieroutes correct (HBV: 15%; HCV 1%).

Het opleidingsniveau was significant gecorreleerd met kennis over HBV en vertoonde een trend naar correlatie met kennis over HCV. Kennis over HCV was significant gecorreleerd met seksueel risicogedrag.

De prevalentie van HCV en HIV bedroeg respectievelijk 0,3% en 1,0% bij MSM die gescreend werden in commerciële ontmoetingsplaatsen en 0% en 1,9% bij MSM die gescreend werden in Exaequo vestigingen.

Conclusie

De kennis over HBV en HCV infecties bij MSM is ontoereikend. Er zijn meer bewustwordingscampagnes nodig, gericht op risicofactoren voor HCV transmissie (groepsseks, chemsex, receptief fisten en het delen van anale speeltjes en anale douche apparaten), en op laagopgeleide MSM. HBV vaccinatie van MSM vereist blijvende aandacht.

De prevalentie van HCV en HIV was laag in commerciële ontmoetingsplaatsen voor MSM en is mogelijk hoger bij oudere MSM of in subculturen waar risicofactoren accumuleren (bijv. chemsex). In de toekomst is het nuttig om te evalueren of het gebruik van internetgebaseerde toepassingen met 'at-home testing', kosteneffectief is.