Acute/Recent Infections and Reinfections by HCV in MSM with and without HIV in the Region of Madrid (ATHENS Study)

 # P376

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Background

Direct-acting antivirals (DAAs) have revolutionized HCV treatment, offering high cure rates and playing a key role in the WHO's goal to eliminate viral hepatitis as a public health threat by 2030 [1].

In high-income countries, DAAs have significantly reduced HCV-related complications and mortality [2,3]. Despite these advances, preventing new HCV infections remains challenging, especially without a vaccine [4].

Data from European countries indicate that HCV infections and reinfections among MSM engaged in high-risk behaviors present a significant challenge to HCV elimination efforts [5-7].

Since much of this information comes from studies conducted in the early years of DAA implementation, it is essential to understand the current landscape, especially given the potential of these treatments to reduce HCV prevalence [8].

1) World Health Organization. **Global hepatitis report 2017**. Geneva, 2017.
2) Politi J, et al. **Hepatology 2022**; 75: 1247.
3) Ramos-Rincon JM, et al. **J Viral Hepat 2022**; 29: 777.
4) Tian F, et al. **Hepatology 2024**; 80: 440.
5) Salazar-Vizcaya L, et al. **Open Forum Infect Dis 2018**; 5: ofy154.
6) Berenguer J, et al. **AIDS 2019**; 33: 685.
7) Koopsen J, et al. **Clin Infect Dis 2021**; 72: e1056.
8) van Santen DK, et al. ***EClinicalMedicine* 2023**; 56:101810.

Study Aim

- Investigate the current epidemiology of HCV infections and reinfections among MSM in the Madrid region, regardless of HIV status.
- Identify key risk factors contributing to HCV transmission in this population group.

Methods I

Design & Setting	Prospective study conducted in the region of Madrid (~7 million) from 2021 to 2023.
Participants	MSM aged 18+ with HIV (**MSM-HIV+**) or without HIV receiving PrEP (**MSM-HIV-**)
Inclusion	• **MSM-HIV+**: Recruited from individuals included since 2015 in the Cohort of the Spanish Network of AIDS Research (CoRIS) in Madrid Centers [1] or those included in the Madrid-CoRE registry (HIV/HCV treated with all-oral DAA in Madrid) [2]. • **MSM-HIV-**: Recruited from PrEP users at Centro Sanitario Sandoval, a major Sexual Health Clinic in Madrid linked to the Madrid-PrEP Registry [3].
Study Visits	• **MSM-HIV+**: Baseline plus FU visits at 6 and 12 mo. (± 2 mo.). • **MSM-HIV-**: Baseline plus FU every 3 mo. up to 12 mo. (following PrEP protocol).
Data Collection	• **MSM-HIV+**: Data registered in an eCRF using REDCap tools. Some baseline data were leveraged from CoRIS and Madrid-CoRE databases. • **MSM-HIV-**: Data imported directly from the Madrid-PrEP Registry database.

1) Sobrino-Vegas P, et al. **Enferm Infecc Microbiol Clin 2011**; 29: 645.
2) Berenguer J, et al. **Hepatology 2018**; 68: 32.
3) Fernández Piñeiro N, et al. **Enferm Infecc Microbiol Clin 2024**. Epub 2024. DOI: 10.1016/j.eimc.2024.03.014

Methods II

Investigations	**Baseline** • Demographics, HCV/STI history, assessment of risky sexual practices and drug use, HIV variables for MSM-HIV+. • Laboratory tests: HCV serology, PCR for Gonorrhea and Chlamydia (pharynx, urethra, anus), syphilis serology, and HIV serology for MSM-HIV-. **Follow-up visits**: • Reassessment of sexual practices, drug use, and repeat lab tests.
Outcomes	• Prevalence of HCV infection (positive HCV-RNA test) at baseline. • Incidence of HCV infection and reinfection during follow-up.
Statistics	• Prevalence/incidence estimates (95% CI), stratified by HCV/HIV status. • Multivariable logistic regression to identify HCV-associated variables. Missing data were handled with multiple imputations.
Ethics	• Study approved by Hospital Gregorio Marañón Ethics Committee. • Informed consent obtained from all participants. • Compliance with local confidentiality and data protection regulations.

Baseline Characteristics of Participants

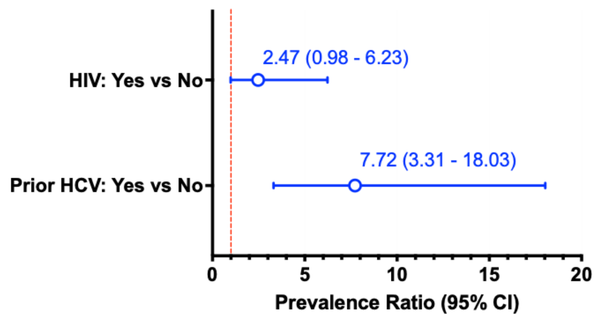
Characteristic	MSM-HIV+ CoRIS N = 492	MSM-HIV+ Madrid-CoRE N = 241	MSM-HIV+ N = 733	MSM-HIV- N = 639	P*
Demographics					
– Age	37.5 (31 - 45)	48 (41 - 55)	41 (34 - 49)	37 (33 - 44)	<0.001
– Native-born Spaniard	287 (58.3)	160 (66.4)	447 (61.0)	368 (57.6)	0.205
– Caucasian	434 (88.2)	206 (85.5)	640 (87.3)	NA	
HIV-related variables					
– Prior AIDS defining categories	49 (10.0)	35 (14.5)	84 (11.5)	NA	
– Antiretroviral therapy	489 (99.4)	241 (100.0)	730 (99.6)	NA	
– CD4 cell count	786 (596 - 983)	773 (555 - 973)	777 (591 - 979)	NA	
– Undetectable HIV RNA	464 (94.3)	228 (94.6)	692 (94.4)	NA	
Risk practices for STI/HCV					
– CLAI in the previous 2 months	229/353 (64.9)	124/185 (67.0)	353/538 (65.6)	623/639 (97.5)	<0.001
– Chemsex	90 /354 (25.4)	90 /186 (48.4)	180/540 (33.3)	157/582 (27.0)	0.023
– Slamsex	12 /354 (3.4)	29 /186 (15.6)	41 /540 (7.6)	18 /361 (5.0)	0.132
Prior history of HCV/STI					
– HVC infection	13 /492 (2.6)	241/241 (100)	254/733 (34.7)	14 /515 (2.7)	<0.001
– Any STI	332/492 (67.5)	218/241 (90.5)	550/733 (75.0)	433/639 (67.8)	0.003
– Syphilis	286/491 (58.2)	208/241 (86.3)	494/732 (67.5)	106/414 (25.6)	<0.001
– *Neisseria gonorrhoeae*	146/443 (33.0)	89 /205 (43.4)	235/648 (36.3)	134/414 (32.4)	0.209
– *Chlamydia trachomatis*	95 /438 (21.7)	62 /200 (31.0)	157/638 (24.6)	135/414 (32.6)	0.005

Abbreviations: STI, sexually transmitted infection; CLAI, condomless anal intercourse.

Baseline Prevalence of Active HCV Infection

Participant category	N°	N° with prevalent HCV	HCV prevalence % (95% CI)
All	**1372**	**23**	**1.68 (1.07 - 2.20)**
MSM-HIV+	733	17	2.32 (1.36 - 3.69)
MSM-HIV-	639	6	0.94 (0.35 – 2.03)
Prior HCV infections	**268**	**15**	**5.60 (3.17 – 9.06)**
MSM-HIV+	254	12	4.72 (2.46 - 8.11)
MSM-HIV-	14	3	21.4 (4.66 - 50.8)
No prior HCV infections	**1104**	**8**	**0.72 (0.31 – 1.42)**
MSM-HIV+	479	5	1.04 (0.34 - 2.42)
MSM-HIV-	625	3	0.48 (0.10 – 0.40)

HCV Prevalence Ratios by HIV Status and Prior HCV Infection

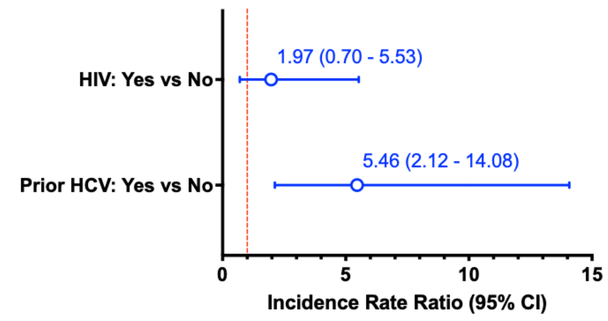


HCV Infection Incidence During Follow-up

Participants with prevalent HCV infection at baseline were excluded from the incidence analysis

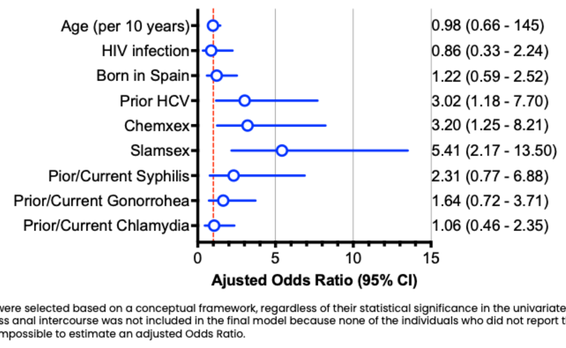
Participant category	N°	Years FU	N° with incident HCV	HCV incidence per 100 PY (95% CI)
All	**1372**	**1240.4**	**18**	**1.45 (0.91 – 2.30)**
MSM-HIV+	733	705.3	13	1.84 (1.07 - 3.17)
MSM-HIV-	639	535.1	5	0.93 (0.39 – 2.24)
Prior HCV infections	**268**	**254.5**	**11**	**4.32 (2.391 – 7.80)**
MSM-HIV+	254	246.8	10	4.05 (2.18 - 7.53)
MSM-HIV-	14	7.7	1	12.9 (1.82 – 91.7)
No prior HCV infections	**1104**	**884.3**	**7**	**0.79 (0.38 – 1.66)**
MSM-HIV+	479	458.6	3	0.65 (0.21 - 2.03)
MSM-HIV-	625	425.8	4	0.94 (0.35 – 2.50)

HCV Incidence Ratios by HIV Status and Prior HCV Infection



Baseline Factors Associated with Acute/Recent HCV Infections

Infections with an estimated duration of < 12 mo. (prevalent and incident)[1] were grouped, reflecting their shared epidemiological context. Reinfections, however, were excluded.



- Variables were selected based on a conceptual framework, regardless of their statistical significance in the univariate analysis.
- Condomless anal intercourse was not included in the final model because none of the individuals who did not report this behavior had HCV, making it impossible to estimate an adjusted Odds Ratio.

1) NEAT-ID Consensus Panel. **AIDS 2020**; 34: 1699.

HCV Reinfections During the Study

Participant category	N°	Person-time years	N° with HCV Reinfection	Reinfection incidence per 100 PY (95% CI)
All MSM	**39**	**22.7**	**2**	**8.70 (1.05 – 31.4)**
MSM-HIV+	29	15.1	1	6.67 (0.17 – 37.1)
MSM-HIV-	10	7.6	1	7.60 (0.32 – 69.6)

Study Population: 39 participants who experienced a first episode of HCV during the study period (either prevalent or incident cases), all of whom achieved HCV RNA negativity during follow-up—36 following DAA therapy and 3 through spontaneous clearance.

Definition of Reinfection: A reinfection was defined as a positive HCV RNA test occurring after a previously negative test, following either DAA therapy or spontaneous clearance.

Person-Time: Calculated from the first negative HCV RNA test after DAA therapy or spontaneous clearance, with censoring at the time of a new positive HCV RNA test, the last recorded HCV RNA test, or the end of the observation period.

Conclusions

- Between 2021 and 2023, the prevalence of active HCV infection among MSM in Madrid was 1.68%, with an incidence rate of 1.45 per 100 PY, indicating ongoing transmission in this group.
- MSM with a history of HCV infection had a significantly higher prevalence (7.7 times) and incidence (5.5 times), identifying them as a key population for targeted interventions.
- Despite successful treatment or spontaneous clearance, the reinfection rate (8.7 per 100 PY) underscores the need for continuous monitoring and tailored prevention strategies.
- Slamsex and chemsex were major drivers of HCV transmission, highlighting the importance of targeted prevention and harm reduction efforts.
- High-risk behaviors among MSM present substantial challenges to HCV elimination, emphasizing the need for focused interventions on screening, rapid treatment, and harm reduction to achieve elimination targets.

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