New Surge of Syphilis among Patients Living with Human Immunodeficiency Virus in Martinique in 2015

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Abstract. A syphilis outbreak began in Martinique, French Antilles, in 2004, initially among men who had sex with men (MSM) and who were living with human immunodeficiency virus (HIV). The outbreak subsequently affected all groups at risk, leading to a first epidemic peak in 2008. After an initial decrease, the outbreak started growing again in 2014 among patients living with HIV with unprecedented incidence among MSM. Herein, we describe the change in medical and social parameters of the outbreak since 2005.

INTRODUCTION

As in other western countries, a syphilis outbreak began in Martinique, French Antilles, in 2004, and concerned initially men who had sex with men (MSM) and who were living with human immunodeficiency virus (HIV). The outbreak spread rapidly in the other groups at risk, including crack cocaine users and persons leaving in precarious conditions. After an initial decrease in incidence, the outbreak started growing again in 2014 among patients living with HIV (PLHIV) and primarily concerns MSM.

Unpublished data of the French sexually transmitted infections (STIs) surveillance network highlight an increase in STIs, including syphilis, since 2012 among MSM, with a progression of high-risk sexual behavior in this population. In France, one-third of patients with a new diagnosis of recent syphilis were coinfecting with HIV. In 2013, the incidence of HIV in Martinique was estimated at 26 per 100,000 person-years; among these persons, 35% were MSM.

MATERIALS AND METHODS

All PLHIV followed in the French University Hospital of Martinique between January 1, 2005 and December 31, 2015, with a new diagnosis of recent syphilis (primary, secondary, or early latent syphilis), were included. Both treponemal (*Treponema pallidum* hemagglutination assay) and nontreponemal tests (Venereal Disease Research Laboratory tests) were performed together at least annually in all PLHIV followed. All positive and discordant results were verified by using fluorescent treponemal antibody absorption. Characteristics of patients with a diagnosis made between January 1, 2005 and June 30, 2010 (first period), were compared with those diagnosed between July 1, 2010 and the December 31, 2015 (second period). Demographic and clinicobiological data were prospectively collected via the standardized electronic medical record Nadis®.¹ We determined the medical and social parameters of patients

affected by this outbreak, including demographical, immunovirological, socioprofessional data, and declared sexual orientation. Syphilis reinfections were defined as two or more distinct episodes of recent syphilis reported by the patient or the medical records.

RESULTS

Among a cohort of 1,047 PLHIV followed in Martinique in 2015, 201 recent cases of syphilis were diagnosed between January 1, 2005 and December 31, 2015 (Table 1). Median age of patients was 40.6 years. Mean annual incidence in the whole outbreak was 2.1%. The outbreak was characterized by a first epidemic peak in 2008 (first epidemic peak) and a new surge in 2015 (second epidemic peak) with respective annual incidences of 4.3 and 3.8%. Annual incidence among MSM living with HIV was evaluated at 6.6% in 2009 and 10.6% in 2015.

The main medical characteristics of patients are presented in Table 2: Age, immunovirological parameters (CD4 count, HIV viral load), and syphilis recurrence rates did not significantly differ between 2008 and 2015.

As shown in Figures 1 and 2, the population affected in the epidemic peaks of 2008 differed from that in 2015.

In 2015, recent syphilis was diagnosed in 36 men, including 31 MSM and two women. In 2008, recent syphilis was diagnosed in 23 men, including 13 MSM and 11 women. The outbreak affected proportionally more MSM during the second peak than during the whole study period (77.5% versus 62.2%, $P = 0.03$), whereas in the first peak MSM were less affected than during the whole study period (38% versus 63.2%, $P = 0.006$).

Socioprofessional status also differed between the two epidemic peaks: 12 patients were unemployed in 2015 (37.5%) versus 25 in 2008 (73.5%) and 93 (46.3%) considering the whole period of the study. Unlike the second peak of 2015, during the first peak, the outbreak affected proportionally more unemployed patients than during the whole period of the study ($P = 0.003$).

Concerning the educational level, recent syphilis was diagnosed among 25 patients without a bachelor's degree in 2008 (73.5%), 26 in 2015 (65%), and 111 (55.2%) considering the whole period of the study. Unlike the second peak of 2015, the first peak of 2008 affected proportionally more

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TABLE 1

Demographic data (number of patients) and incidence of recent syphilis among patients followed for HIV infection in Martinique per year, 2005–2015

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
PLHIV (total)	659	724	760	787	816	851	892	947	962	991	1,047
Women	245	267	279	291	314	333	343	362	368	365	378
Heterosexual men	259	274	293	295	299	313	332	355	346	364	377
MSM	155	183	188	198	203	205	217	230	248	262	292
Recent syphilis											
Total	Number	12	11	13	34	10	11	18	15	12	25
	Incidence (%)	1.8	1.5	1.7	4.3	1.2	1.3	2	1.6	1.2	2.5
MSM	Number	7	7	7	13	6	6	13	11	10	20
	Incidence (%)	4.5	3.8	3.7	6.6	3.0	2.9	6.0	4.8	4.0	7.6

HIV = human immunodeficiency virus; MSM = men who have sex with men; PLHIV = patients living with HIV.

patients with a lower educational level compared with the whole period of the study ($P = 0.04$).

DISCUSSION

In 2000, a syphilis outbreak started in western countries, including France.² This outbreak appeared in Martinique in 2004 among MSM living with HIV. Four years later, it shifted to other groups at risk, including heterosexuals, leading to a first epidemic peak in 2008.³ This shift was similar to that reported previously for HIV infection.⁴

The incidence of recent syphilis among PLHIV in Martinique more than tripled in 2015 compared with 2013. This highlights a clear surge of new cases during the past 2 years. However, the sociodemographic characteristics of infected patients have changed: although almost three-quarters of patients in the first epidemic peak were unemployed and/or had a low educational level, the proportion of patients in these categories was significantly lower in the 2015 peak. This sociodemographic switch may be related to the shift from one group at risk (PLHIV living in precarious conditions, crack-cocaine users, and sex workers) to another (MSM) with a higher mean socioprofessional level. In contrast, MSM were a minority during the 2008 epidemic peak, but the majority in 2015, confirming the upsurge during the two last years. However, these findings, which concern PLHIV, may not be generalizable to other populations affected by the syphilis epidemic and who are not infected with HIV. This outbreak of syphilis among MSM in

Martinique is not isolated. Indeed, similar outbreaks have previously been reported throughout the world at different times.^{5–9} The acquired immunodeficiency syndrome epidemic has resulted in behavioral changes with a decrease in syphilis among MSM in the 90s.¹⁰ The current surge of syphilis is consistent with reports of increased high-risk sexual practices among MSM,⁸ in part related to a decreased perceived risk of HIV transmission, due to highly active antiretroviral therapy¹¹ and preexposure prophylaxis development.¹² As already described,¹³ the increasing use of social media to meet sex partners could also have facilitated the rapid expansion of syphilis among MSM in Martinique. The high incidence of recent syphilis among patients already followed for an HIV infection, especially since 2010, reflects the lack of condom use and the failure of prevention policies in this population. Unfortunately, data on sexual practices were not collected in this study, and we do not know if this new surge is associated with a progression of high-risk sexual behavior. Another limitation to the study is the lack of a multivariate analysis, due to the small number of patients, to control for confounders in the characteristics of the population.

Syphilis is the most common coinfection in newly diagnosed PLHIV in France¹⁴ and is associated with more frequent complications among PLHIV.² As syphilis increases the risk of HIV infection¹⁵ and because MSM are at the highest risk of HIV infection,¹⁶ the control of this outbreak is a priority. Monitoring syphilis incidence among PLHIV is also an excellent indicator of sexual risk-taking among high-risk populations, including MSM. This study offers the

TABLE 2

Main characteristics of patients with recent syphilis among patients followed for HIV infection in Martinique: comparison between the first (2008) and the second (2015) epidemic peak

	2005–2015 (N = 201)	2008 (N = 34)	2015 (N = 40)	P value*
Age (years)	40.1 (31.6–46.6)	42.4 (36.6–48.6)	40.5 (29.1–48.5)	0.2
Women	23 (11.4%)	10 (31.5%)	2 (5%)	0.009
MSM	127 (63.2%)	13 (38.2%)	31 (77.5%)	< 0.001
Non-MSM men	51 (25.4%)	11 (32.4%)	7 (17.5%)	0.1
Viral hepatitis	25 (12.4%)	6 (17.6%)	2 (5%)	0.1
Immunovirological parameters				
Nadir CD ⁴ (/mm ³)	294 (132–400)	296 (119–379)	270 (170–478)	0.5
CD ⁴ (/mm ³)	584 (478–721)	558 (471–703)	621 (531–733)	0.8
HIV viral load (UI/mL)	20 (20–444)	20 (20–13,000)	20 (20–594)	0.4
HIV diagnosis (vs. syphilis):				
Before	152 (75.6%)	25 (73.5%)	36 (90%)	0.07
Concurrent	38 (18.9%)	7 (20.6%)	4 (10%)	
After	11 (5.5%)	2 (5.9%)	0	
Previous syphilis	74 (36.8%)	10 (29.4%)	14 (35%)	0.6

HIV = human immunodeficiency virus; MSM = men who have sex with men.

* Comparison between 2009 and 2015 (Student's test for quantitative values, χ^2 or Fisher's test for qualitative values).

FIGURE 1. Number of new cases of recent syphilis per year among patients followed for human immunodeficiency virus infection in Martinique according to gender and sexual orientation. This figure appears in color at www.ajtmh.org.

opportunity to establish the sociodemographic shift of this new surge in a relatively isolated population of 400,000 people living in Martinique, and to sound the alarm on sexual risk-taking among the MSM population.

CONCLUSION

These data reveal a growing outbreak of syphilis since 2014 among PLHIV in Martinique. Contrary to the first epidemic peak of 2008, this new outbreak concerns mainly MSM. A strengthening of targeted preventive policies to prevent high-risk sexual practices is urgently required.

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FIGURE 2. Number of new cases of recent syphilis per year among patients followed for human immunodeficiency virus infection in Martinique according to the professional status. This figure appears in color at www.ajtmh.org.

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REFERENCES

- Pugliese P, Cuzin L, Cabié A, Poizot-Martin I, Allavena C, Duvivier C, El Guedj M, de la Tribonnière X, Valantin MA, Dellamonica P, Nadis Group, 2009. A large French prospective cohort of HIV-infected patients: the Nadis Cohort. *HIV Med* 10: 504–511.
- Fenton KA, Breban R, Vardavas R, Okano JT, Martin T, Aral S, Blower S, 2008. Infectious syphilis in high-income settings in the 21st century. *Lancet Infect Dis* 8: 244–253.
- Cabié A, Rollin B, Pierre-François S, Abel S, Desbois N, Richard P, Hochedez P, Théodose R, Quist D, Hélénon R, Derancourt C, Cavalier A, Liautaud B, 2010. Reemergence of syphilis in Martinique, 2001–2008. *Emerg Infect Dis* 16: 106–109.
- Figuerola JP, Brathwaite A, Ward E, DuCasse M, Tscharf I, Nembhard O, Williams E, 1995. The HIV/AIDS epidemic in Jamaica. *AIDS* 9: 761–768.
- Chow EPF, Wilson DP, Zhang L, 2011. HIV and syphilis co-infection increasing among men who have sex with men in China: a systematic review and meta-analysis. *PLoS One* 6: e22768.
- Kahn RH, Heffelfinger JD, Berman SM, 2002. Syphilis outbreaks among men who have sex with men: a public health trend of concern. *Sex Transm Dis* 29: 285–287.
- Zoni AC, González MA, Sjögren HW, 2013. Syphilis in the most at-risk populations in Latin America and the Caribbean: a systematic review. *Int J Infect Dis* 17: e84–e92.
- Wolitski RJ, Valdiserri RO, Denning PH, Levine WC, 2001. Are we headed for a resurgence of the HIV epidemic among men who have sex with men? *Am J Public Health* 91: 883–888.
- Centers for Disease Control (CDC), 1984. Syphilis: United States, 1983. *Morb Mortal Wkly Rep* 33: 433–436.

10. Stall RD, Hays RB, Waldo CR, Ekstrand M, McFarland W, 2000. The Gay '90s: a review of research in the 1990s on sexual behavior and HIV risk among men who have sex with men. *AIDS 14 (Suppl 3)*: S101–S114.
11. Kravcik S, Victor G, Houston S, Sutherland D, Garber GE, Hawley-Foss N, Angel JB, Cameron DW, 1998. Effect of antiretroviral therapy and viral load on the perceived risk of HIV transmission and the need for safer sexual practices. *J Acquir Immune Defic Syndr Hum Retrovirol 19*: 124–129.
12. Strauss BB, Greene GJ, Phillips G, Bhatia R, Madkins K, Parsons JT, Mustanski B, 2016. Exploring patterns of awareness and use of HIV pre-exposure prophylaxis among young men who have sex with men. *AIDS Behav 21*: 1288–1298.
13. Centers for Disease Control and Prevention (CDC), 2003. Internet use and early syphilis infection among men who have sex with men: San Francisco, California, 1999–2003. *Morb Mortal Wkly Rep 52*: 1229–1232.
14. Morlat P, 2013. *Prise en charge médicale des personnes vivant avec le VIH. Recommandations du groupe d'experts. Rapport 2013*. Available at: <http://www.sante.gouv.fr/rapport-2013-sur-la-prise-en-charge-medicaledes-personnes-vivant-avec-le-vih.html>. Accessed September 20, 2016.
15. Fleming DT, Wasserheit JN, 1999. From epidemiological synergy to public health policy and practice: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. *Sex Transm Infect 75*: 3–17.
16. Roberts CP, Klausner JD, 2016. Global challenges in human immunodeficiency virus and syphilis co-infection among men who have sex with men. *Expert Rev Anti Infect Ther 14*: 1037–1046.