Panorama *of* Emergency Medicine

Vol. 2 No. 1 2024 Original Article

The Epidemiology of Syphilis and Co-infection with HIV in a Tertiary Care Center in Lebanon: A Retrospective Review

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ABSTRACT

Introduction

Syphilis is an ancient STI causing a new worldwide outbreak in general and in Lebanon specifically.

Methods

We conducted a retrospective chart review to assess the rate of syphilis increase in an infectious diseases clinic in Lebanon from 2006 to 2023. We studied the epidemiology of these cases, stage and treatment response and their association to HIV infection and its control.

Results

There was an 862% increase in syphilis cases from 2006 to 2019. Most of our cases were middle-aged men living with HIV. Most of them had well-controlled HIV infection (83%) with CD4 counts above 200 (90%). Most of the diagnosed cases of syphilis were primary and secondary (98%), responding to penicillin G.

Discussion

Our data mostly parallels international data, except for gender distribution. Despite successful treatment of most cases in our clinic, the alarming rise of new cases highlights the urgent need for public health measures to mitigate this epidemic.

Conclusion

Inclusive awareness is needed to stop syphilis spread in Lebanon, and more screening is key in identifying new cases early for a successful eradication.

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Submitted: 1 July 2024
Revised: 5 Sep 2024
Accepted: 9 Sep 2024

Published by New Health Concept
panoramaoem.cloud

How to cite this paper? Abdessamad H, El Khatib D, Hojeij M, T Azzam W, Asmar R, et al. The Epidemiology of Syphilis and Co-infection with HIV in a Tertiary Care Center in Lebanon: A Retrospective Review. Panorama of Emergency Medicine. 2024,2(1)
http://doi.org/10.26738/poem.v2i1.40

INTRODUCTION

Syphilis is a bacterial sexually transmitted disease. The disease starts as a painless sore on the genitalia, rectum, or mouth. Although the treatment of syphilis is simple, the co-infection of syphilis and the Human Immunodeficiency Virus (HIV) can have significant morbidity and sometimes mortality [1].

With advances in the treatment of HIV, it became easy to slow down viral replication shortly after anti-retroviral therapy is initiated [2]. This is seen as an "undetectable" result on blood quantitative Polymerase Chain Reaction (PCR) for HIV, translating to an un-transmissibility of the virus [2]. Hence, treatment of HIV is one of the best methods to limit its spread. In addition, the widespread use of the HIV pre-exposure prophylaxis (PreP), is another effective protective factor against acquiring HIV in healthy individuals before exposure [3].

This does not come without a downside, as undetectable viral load status in people on treatment as well as the availability of PreP offered people a false sense of security, encouraging them further to engage in unprotected sex [4]. This increases the risk of acquiring other sexually transmitted infections (STIs). A perfect example is syphilis, which is acquired through unprotected intercourse, and whose screening can serve as a marker for risky sexual behavior [5]. The real-life situation is a translation of that, with the rising incidence of syphilis worldwide as well as in Lebanon, especially among the population of People Living with HIV (PLH). According to CDC, there has been an increase syphilis cases in the United States, from 101590 new cases in 2017 to 171074 in 2021 [6]. The rates of congenital syphilis have also increased from 941 in 2017 to 2677 in 2021 [6]. As per the World Health Organization (WHO), syphilis is present in up to 12% of the population of men who have sex with men (MSM) [7].

Besides, with the economic crisis smashing Lebanon since 2019 and subsequent shortage of and rising prices of drugs and condoms, there is a reduced usage of PrEP and condoms [8].

It has become certain that syphilis and HIV have a high rate of co-occurrence [9]. These two diseases share a synergistic relationship. Syphilis provides a favorable environment for HIV acquisition through the impairment of mucosal barrier and increased presence of white blood cells (WBCs) in the area [9]. Moreover, syphilis infection can result in decreased CD4 count and increased HIV viral load [10]. To our knowledge, no studies have previously assessed the relation of HIV CD4 count and viral load on the serologic response of syphilis to treatment.

Therefore, this study provides scientific evidence about syphilis rates in people who live with HIV and in the general population by gathering data from 2006 till 2023, thus reflecting the outcome of the economic crisis during this period. Furthermore, this study discusses the effect of HIV on syphilis' serology response to treatment.

MATERIAL & METHODS

Study type

Retrospective observational study.

Objectives

- To determine the prevalence of syphilis in our ID clinic from 2006 to 2023
- To determine the rate of co-infection with HIV among those diagnosed with syphilis.
- To describe the demographics of people with syphilis and the reason they get tested.
- To describe their response to treatment
- To address the effect of HIV on the prognosis of syphilis

Procedure

We included 11396 Lebanese adults since 2006 till 26 December 2023 and documented their syphilis and HIV status. The study included 2 phases:

Phase I: Files from 12/2006 till 12/2023: We accessed the files of 11396 patients who presented to the infectious diseases (ID) clinics at the LAU Medical Center – Rizk Hospital in Beirut, Lebanon (LAUMCRH) who are at least 18 years old. We checked these patients' syphilis and HIV status. This data helped to determine the changing rate of syphilis throughout the years in the population of patients presenting to infectious diseases clinics at our center.

Phase II: We followed up the data of 91 patients who had syphilis from December 2016 till April 2023 and collected information about their age, gender, sexual orientation, reason for syphilis screening, syphilis serology response to treatment, and their HIV status. Those who were HIV positive were further assessed to determine their CD4 count, HIV viral load, and if both infections were concomitant at the time of diagnosis.

Ethical Considerations

This study was done in accordance with the Declaration of Helsenki and was approved by the by the Ethical Committee for Research at Lebanese American University (LAU¬), Institutional Review Board.

In order not to breach patient confidentiality, another sheet was made linking the patient names to numbers and this number is the one to be used in the data collection sheet. The former was destroyed.

RESULTS

The percentage of syphilis positivity in patients presenting to ID clinics remained less than 1% from 2006 till 2013 but has increased to 3.37% in 2014 and 8.08% in 2015. After that, it plateaued until 2020 where new cases started increasing in frequency again up to 19.52% in 2023.

The analysis of the 91 patients who admitted to the infectious disease clinic showed that 95.6% (88 patients) were males, 3.3% were females and 1% transgender women. Among those, 3% were heterosexual, 46% were homosexual and 48% did not have documentation of their sexual orientation.

In terms of age distribution, most of these patients fell within the age range of 30-39 years (43 patients), followed by the age range of 40-49 years (20 patients). There were 13 patients aged between 18-29, 10 patients aged between 50-59, and 4 patients who were 60 years old or older.

Among those with a diagnosis of syphilis, 81% (74/91) were HIV positive. 9% of those had concomitant acquisition of both infections, diagnosed with syphilis and HIV in the first visit and 91% were already known to be PLH at the time of diagnosis. 86% of these patients had a controlled HIV infection and 91% had a CD4 count above 200/mm^3.

Most diagnosed syphilis cases were primary and secondary syphilis (98%). All of them were treated with benzathine penicillin G, and only 2 patients were treated with doxycycline. 32% of the patients did not follow-up with a VDRL test after the injection, 24.7% showed decreasing serology, 31.8% showed stable serology after 6 months and 11% were re-infected at some point after this follow-up.

Those reasons for syphilis screening varied between voluntary, suspected partner, pre-workup testing, and physician-initiated testing and counseling. For the reason of syphilis screening among PLH, 85% were referred by a physician for syphilis testing during a physical examination. The remaining patients had different reasons for admission: 5.8% sought voluntary testing, 4.6% were admitted due to suspected exposure from a sexual partner, and another 4.6% were admitted for pre-work up testing.

Statistical analysis was performed using IBM SPSS 29.0. Descriptive statistics were reported using frequencies and percentages for the categorical variables, and median, mean, and standard deviation for the continuous variables. In our analysis, we utilized the chi square test to assess the relationship between categorical variables. We used Fischer's exact test since the sample size and the expected frequencies are low.

Based on the chi square tests that were performed to see association between CD4 counts and serological response to treatment, there was no statistically significant association found between CD4 levels, HIV status, HIV VL on diagnosis, patient age and the serologic response to treatment (respective p-values 0.2, 0.051, 0.129, 0.21) . No significant association was seen between concomitant acquisition of syphilis and HIV and serologic response to treatment (p=0.19).

DISCUSSION

This study highlights the magnitude of the syphilis epidemic that is exploding in numbers all over the world. The WHO states that 7.1 million people were diagnosed with syphilis in 2020, with a global trend that is increasing exponentially. While a variety risk factors exist for syphilis, it shares many of them with other STIs, namely HIV, which is by itself considered a risk-factor for syphilis acquisition [11].

This is highlighted in our data, where the biggest bulk of syphilis cases were in PLH. However, in our population, these PLH have a well-controlled HIV infection, which reflects a close medical follow-up, which translates to increased STI screening, further showed by the high rates of physician referral cause for screening. Therefore, the high rates of syphilis in PLH in our clinic, while true, might be an over-estimation of the true connection between HIV and syphilis.

The majority of cases were seen in the middle-aged people, which goes in accordance with the global trend 12, where such ages are usually the most likely to engage in risky sexual behavior and IV drug use.

Another notable finding in our data is the high prevalence of syphilis in the male population, where more than 95% of cases are seen in men. This is different than in other areas of the world, such as the United States (US), where two-thirds of the syphilis population is male, and the rest is mostly female [12]. This would reflect that some of the risk factors associated with syphilis might be area specific, such as the much higher rate of unprotected intercourse, multiple sexual partners and IV drug use in the male population in Lebanon [13].

Besides, there were no cases of congenital syphilis seen in our clinic throughout those years, which can be explained need to be married in couples who have children and the enforced premarital screening in the Lebanese population, despite STI screening not being part of the prenatal tests offered [14]. Another explanation might be that such individuals might follow-up in the obstetrics clinics rather than ID clinics.

While half of our population did not have documentation about their sexual orientation, we can see that the majority of those who did were MSM, which is in accordance with data in other countries such as the USA, [15] and this can be explained by the high sexual activity of MSM compared with MSW and WSM. Besides, this population often faces stigma which leads to more secrecy around their sexual behavior and any STI symptoms they have [16].

Since Lebanon is a country where the fight against gender inequality is on-going, women can have challenges regarding access proper sexual education or healthcare related to sexual health, especially if not married [17]. Besides, sex is highly stigmatized before marriage, possibly making unmarried women less sexually active then men [18]. However, even if they developed symptoms of syphilis, women may not be aware of their seriousness or the need to get tested or they might choose to hide them [19, 20]. All these would possibly lead to less syphilis diagnoses in women [19].

Regarding men, MSM practices are also highly stigmatized in Lebanon, making the MSM population seek less sexual medical help or hide any symptoms that develop [21]. This would lead to prolonged cases of latent syphilis and more transmission and might hint that the actual numbers of positive cases with syphilis is much higher than documented [21].

It is important to note the stagnation in cases during the coronavirus pandemic years, which is linked to decreased testing for STIs during that period and more social isolation, as stated by the CDC [22]. The cases re-emerge in numbers after the pandemic resolved, which can be explained by the increased encounters after isolation, the economic crisis and rising prices of effective protection means as well as resuming testing in a lot of individuals [23, 24].

Besides, most of our population was treated with the gold-standard benzathine penicillin G, which would explain the low rates of treatment failure. Here it is worth mentioning that the majority of cases were diagnosed in the early PSS stages, which translates to easier disease eradication [25]. In addition, most of PLH had a controlled HIV infection, which would contribute to higher treatment success as well [26].

Since most of our patients had controlled HIV infection and early syphilis detection, most were successful in successfully treating their infection, and this would explain why no statistically significant association was seen between HIV infection, viral load, CD4 count and syphilis treatment success.

However, despite successfully treating most patients presenting to our clinic, syphilis is on the rise, and in dangerous rates. This would impact the national cost of medical care and can lead to a public health crisis, where congenital syphilis usually starts rising few years after the PSS surge [27]. This study highlights the urgent need for deployment of robust public health interventions to maximize prevention, sexual health, screening, and diagnosis to help impede this syphilis outbreak.

LIMITATIONS

This was a retrospective review, which limits our analysis to the data documented in the charts. This would make the data more prone to selection and information bias, making it more difficult to interpret temporal relationships and control bias. To mitigate that, we limited our analysis to the data that is most complete in our records and maintained a descriptive approach that would visualize the data with greatest transparency and limit over-interpretation.

Perhaps larger scale prospective studies with more power are needed in the future for a more robust assessment of the current situation regarding syphilis in Lebanon. Besides, they would provide new statistics of the current situation, which is much needed to closely monitor a disease that is having a new outbreak.

CONCLUSION

As syphilis continues to be a national public health threat, its predominant association with HIV and MSM populations make it imperative to implement public health measures that are specific to these populations. These measures can be promoting awareness, sexual health, condoms and others. Indeed, there is also a need to maximize screening for early detection and successful treatment. Public health interventions such as educational campaigns to target the populations with the highest risk is crucial. Finally, in PLH, maintaining good immunity by viral suppression aids in successful treatment of syphilis.

Keywords

Syphilis, HIV, STI, Transmission, Treatment, Epidemic

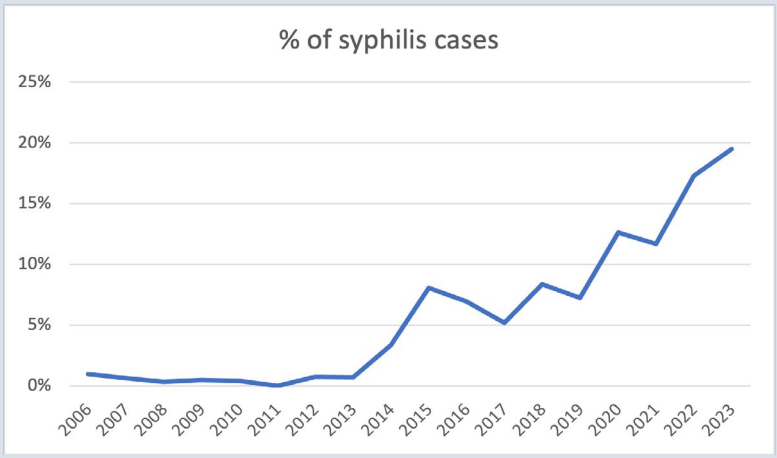

FIGURE 1 - Percentage of Syphilis Cases among Patients Presenting to the ID Clinic between 2006 and 2023.

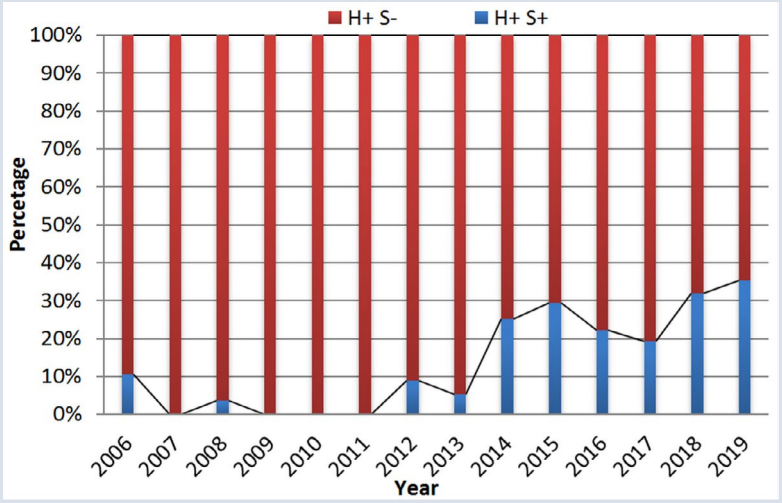

FIGURE 2 - Percentage of Syphilis Cases among PLH between 2006 and 2019.

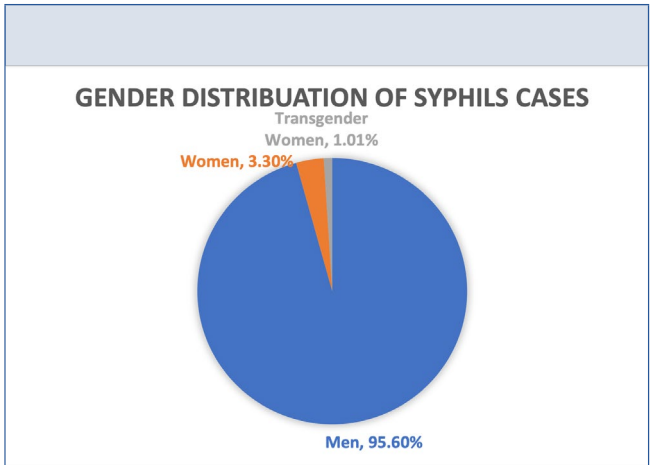

FIGURE 3 - Gender Distribution of Syphilis Cases.

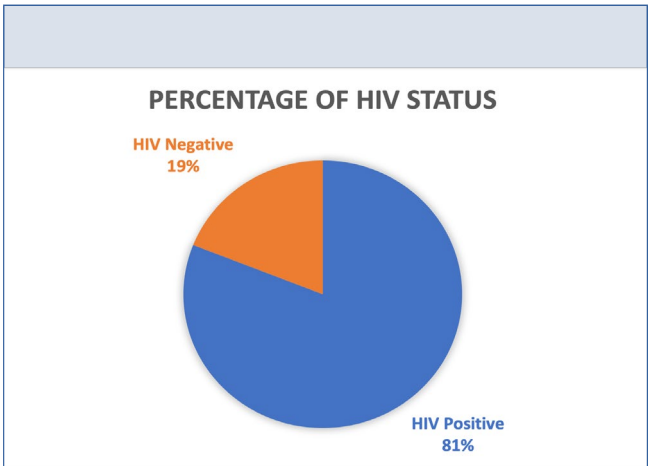

FIGURE 4 - HIV Status of Syphilis Cases.

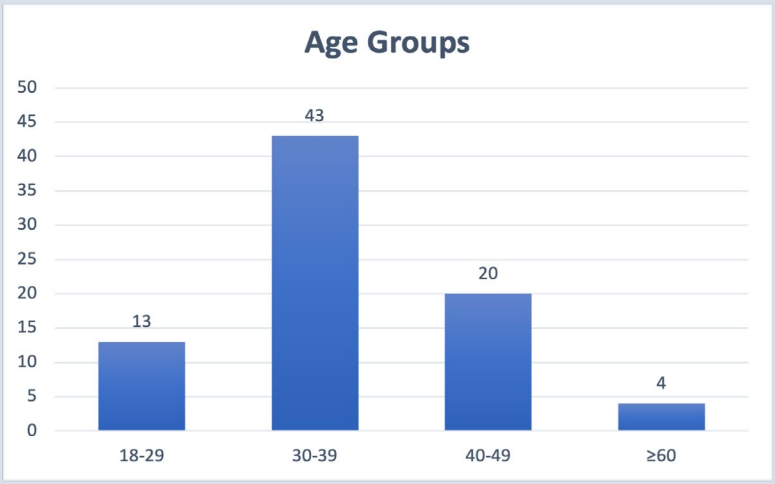

FIGURE 5 - Age Distribution of Syphilis Cases.

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All authors contributed equally and validated the final version of record.

Acknowledgments

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Declarations

Conflicts Of Interests

The Authors declare that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Registration

No registration applicable.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethical approval

Ethical approval for this study was not required.

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