International Journal of Infectious Diseases 17 (2013) e84–e92

Contents lists available at SciVerse ScienceDirect

International Journal of Infectious Diseases

journal homepage: www.elsevier.com/locate/ijid

Review

Syphilis in the most at-risk populations in Latin America and the Caribbean: a systematic review

Ana Clara Zoni, Mónica Alonso González *, Helena Werin Sjögren

HIV/STI Project, Family and Community Health Area, Pan American Health Organization, 525 Twenty-third Street, NW, Washington, DC 20037, USA

ARTICLE INFO

Article history:
Received 18 February 2012
Received in revised form 21 May 2012
Accepted 2 July 2012

Corresponding Editor: William Cameron, Ottawa, Canada

Keywords:
Syphilis
Most at-risk population
Prevalence
Infectious diseases

SUMMARY

Objective: To describe syphilis prevalence in men who have sex with men (MSM), the transgender population, and sex workers and their clients, identifying critical geographical areas, trends, and data gaps in Latin America and the Caribbean.

Methods: A systematic review of syphilis prevalence was conducted by searching PubMed, LILACS, EMBASE, conference records, and other sources (2000–2010).

Results: Forty-eight articles were included in the review, from which 84 data points were identified relating to MSM and female sex workers and only 10 relating to the transgender population, male sex workers, and clients of sex workers. Most studies were from Latin America (83%), with fewer from the Caribbean (17%). Critical 'hotspot' cities were Sao Paulo, Buenos Aires, Guatemala, Puerto Barrios, San José, San Pedro, Managua, San Salvador, and Acajutla, with high syphilis prevalence in more than one study population. Gaps in the availability of information on syphilis prevalence were identified for Ecuador, Uruguay, and Bolivia, and most countries in the Caribbean. Chronological trends showed that syphilis infection is well-established among the study populations.

Conclusions: Consistently high levels of syphilis among the investigated populations throughout the study period show that there is a need to improve monitoring, surveillance, and evaluation of sexually transmitted infection control interventions among these populations. Improved reporting and standardization of syphilis testing is recommended, as well as a heightened focus on more effective syphilis control strategies.

1. Introduction

Syphilis is an important public health problem worldwide, having serious consequences for health if left untreated. During the early phases of infection, common symptoms include the appearance of a sore called a 'chancre' at the site of inoculation, followed by headache, achiness, and a rash. Even without treatment, both primary and secondary lesions resolve, and the infection then enters a latent stage. The disease may also progress to a number of significant late manifestations (tertiary syphilis), including cardiovascular, gummatous, and neurological complications. Mother-to-child transmission may occur at any stage of pregnancy in infected women and can trigger abortion, fetal death, neonatal mortality, premature labor, low birth weight, and congenital syphilis.[1] In addition, syphilis is one of a number of ulcerative diseases that increase the risk of acquisition and transmission of HIV through several mechanisms.[2]

Despite syphilis being a treatable disease, diagnostic challenges continue to affect global control efforts, due to the natural history of the disease (a long latent infection stage) and testing algorithms that need to be interpreted in the context of clinical history, examination, and any past record of treatment. Given the various clinical manifestations of syphilis, laboratory testing is a very important aspect of diagnosis. Syphilis should be diagnosed using a combination of treponemal and non-treponemal serological tests to reach a high sensitivity and specificity, for both asymptomatic and symptomatic infections. The use of non-treponemal tests alone is not advised because of the delay in the production of antibodies in the early stages, the incidence of false-positives, and the prozone phenomenon. Quantitative non-treponemal tests are particularly useful for monitoring the response to treatment, to estimate the stage of disease, to distinguish active syphilis from lifetime syphilis (titers of 8 or more dilutions are interpreted as corresponding to active infection), and in the diagnosis of re-infection (because treponemal tests remain positive for life). Treponemal tests are more specific, become positive earlier, and are more perdurable than the above-mentioned tests, but titers do not correlate with the activity of the infection.[1]

* Corresponding author. Tel.: +1 202 9743954; fax: +1 202 9743631.
E-mail address: alonsomon@paho.org (M.A. González).

1201-9712/$36.00 – see front matter
http://dx.doi.org/10.1016/j.ijid.2012.07.021

According to recent World Health Organization (WHO) estimates, in 2008 there were 10 million new cases of syphilis among adults around the world, and 2.8 million (28%) occurred in America.[3] Estimated values for syphilis prevalence for the year 2005 in male and female adults of the general population in this region were 1.27% and 1.22%, respectively.[4] Countries of Latin America and the Caribbean (LAC) are making efforts to control syphilis infection, and in particular are aiming to eliminate congenital syphilis.[3,5]

Syphilis is not homogeneously spread within the population; the most at-risk populations (MARPs) (and subgroups within these), such as men who have sex with men (MSM), transgender (TG), and sex workers (SW) and their clients (CSW), are disproportionately affected by syphilis.[3,6] An overview of syphilis levels in the region would give a better understanding of the epidemiological situation of syphilis in MARPs, and help to strengthen response plans and strategies and the achievement of national, regional, and global targets, including the Initiative for Elimination of Mother-to-Child Transmission of HIV and Congenital Syphilis (EI), United Nations General Assembly Special Session (UNGASS) targets, and Millennium Development Goals.

The objective of this study was to describe the prevalence of syphilis in MSM, TG, SW, and CSW, identifying critical geographical areas, trends, and data gaps in the countries of LAC.

2. Methods

A systematic review was conducted in order to find data on syphilis prevalence in MSM, TG, SW, and CSW in LAC. Potentially relevant abstracts were identified in the PubMed, LILACS, and EMBASE databases. Experts on the topic were consulted and institutional web pages were also reviewed. The following search terms were used: "Syphilis" OR "*Treponema pallidum*" AND "Prevalence" AND a combination of the names of all countries, capitals, and main cities of LAC. Keywords were introduced in the database as text terms (all fields). Detailed information on the search terms and sources is provided as Supplementary Material, available online.

This review was conducted and reported in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) Statement issued in 2009.[7]

For inclusion in the review, studies had to fulfill the following criteria: (1) published and unpublished studies from 2000 to 2010 that provided syphilis prevalence in adults or adolescents among the following population groups: MSM, TG, SW, and CSW, within LAC countries; (2) sample size of at least 100 participants for all groups, except for the TG population for which the minimum sample size was lowered to 75.

Two reviewers independently applied the inclusion criteria to potential studies, with any disagreements resolved by discussion. For abstracts that met the inclusion criteria, the full papers were assessed. The principal outcome of this study was the syphilis prevalence in at least one of the populations under analysis. Data were registered based on syphilis prevalence per location, vulnerable group, and year. Thus, one citation could yield more than one record.

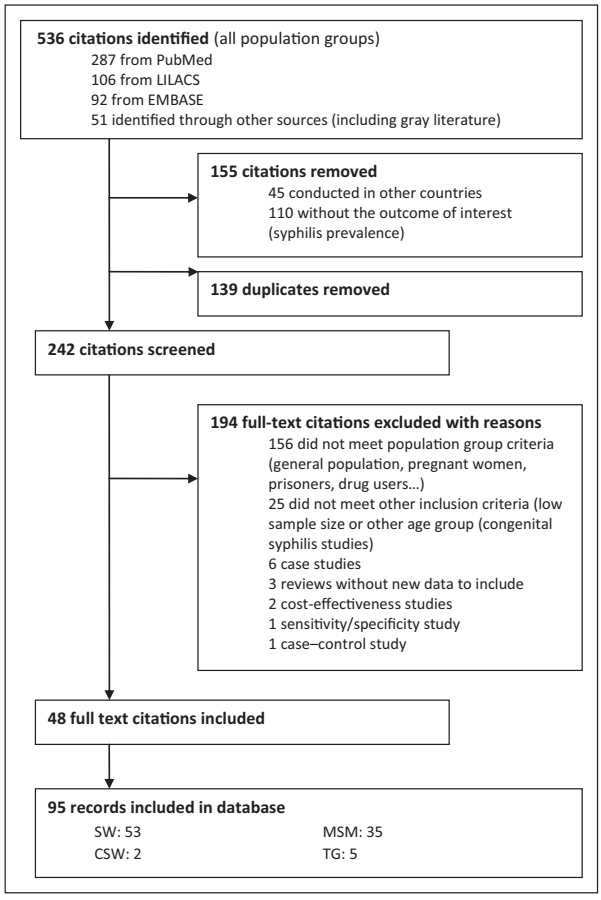
The syphilis test algorithms were organized into the following categories: (1) non-treponemal test (a positive rapid plasma reagin (RPR) or venereal disease research laboratory (VDRL) test), (2) treponemal test (a positive *Treponema pallidum* hemagglutination assay (TPHA), fluorescent treponemal antibody-absorption (FTA-ABS) test, or *Treponema pallidum* particle agglutination (TPPA) test), (3) quantitative non-treponemal test (a positive RPR or VDRL with a titer $\geq$1:8), (4) non-treponemal and treponemal tests (positive RPR or VDRL with a confirmatory TPHA, FTA-ABS test, or TPPA test), and (5) unknown testing algorithm. For the analysis, these groups were condensed into two: (1) prevalence of active syphilis tested, this included quantitative non-treponemal test or non-treponemal plus treponemal tests; (2) prevalence of unspecified syphilis tested for those studies that did not distinguish between active or lifetime syphilis, or those that did not report the test algorithm applied. Clinical signs and symptoms were not used to adjust the abovementioned categories given that they were inconsistently and rarely reported.

Statistical trend testing was analyzed where possible.

3. Results

The initial search identified a total of 536 citations. Most studies were excluded at first screening because they did not report syphilis prevalence, or were conducted in countries outside of LAC, leaving 242 studies for further screening. Of these, 194 were excluded, the majority because they addressed other population groups. Agreement between reviewers was unanimous for the excluded citations. Figure 1 shows the search algorithm used, which was organized in accordance with the PRISMA guidelines. Forty-eight full-text articles met the inclusion criteria and these provided 95 data points (Table 1[8–55]). Study population totals are given in Table 2.

Studies on the prevalence of syphilis in the populations under investigation were identified for only 18 of the 45 countries and territories of LAC; 83% of the studies were reported from Latin American and 17% from the Caribbean.



SW: sex worker; MSM: men who have sex with men; CSW: clients of sex workers; TG: transgender.

Figure 1. Search algorithm organized according to PRISMA guidelines.