

Sexually Transmitted Pathogens in Key Populations Attending the Institute of Social Hygiene Hospital in Dakar, Senegal

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ABSTRACT

Introduction: *Chlamydia trachomatis* urogenital infection is one of the leading causes of bacterial Sexually Transmitted Infections (STIs) and responsible for many complications. This study aimed to assess the prevalence of sexually transmitted pathogens in key populations in Senegal.

Materials and methods: A retrospective study from January to December 2018 was carried out at the Institute of Social Hygiene in 2 key populations namely Men who have Sex with Men (MSM) and Female Sex Workers (FSW) presented symptoms of STIs. For each patient, blood samples and urethral or vaginal sample were collected. Diagnostic of STIs microorganisms including *Treponema pallidum*, *C. trachomatis*, *Neisseria gonorrhoeae* and *Trichomonas vaginalis* was performed.

Results: Two hundred fourteen patients (173 FSW and 41 MSMS) with STIs symptoms were included in this study. STI diagnosis was confirmed in 176 participants giving an overall STIs rate of 82% (176/214). Among them, 80% (141/176) were FSW and 20% (35/176) were MSM. *C. trachomatis* was found in 55% of cases (97/176) followed by *N. gonorrhoeae* (18%; n=32/176), *T. vaginalis* (15%; n=26/176) and *T. Pallidum* (12%; n=21/176). Interestingly, *C. trachomatis* infection was exclusively detected in FSW with a rate of 68.8% (97/141). In addition, *C. trachomatis* was associated with other STIs agents in 22 cases (23%) namely *T. pallidum* (5.2%; n=5/97), *N. gonorrhoeae* (3.1%; n=3/97), and *T. vaginalis* (14.4%; n=14/97). *C. trachomatis* was found in all age groups, however, young people (<30 years) seems to be more affected with 58.8% (57/97).

Conclusion: This study showed a predominance of *C. trachomatis* infections among FSW suggesting the importance to consider this STI's pathogen in the management of key populations in Senegal.

Keywords: *Chlamydia trachomatis*; Sexually Transmitted Infections (STIs); Key populations

INTRODUCTION

Sexually Transmitted Infections (STIs) is a major public health concern because of their frequency, their complications as well as their role in facilitated transmission of HIV [1]. Worldwide, more than 357 million people contract an STI each year, and *Chlamydia trachomatis*, the most common, is responsible for more than 130 million new cases [2]. WHO estimated that the incidence of *Chlamydia trachomatis* is high in sub-Saharan Africa, with more than 10 million new infection annually [3]. Although, these infections could affect all categories of the sexually active population, they are more common in key populations, especially in Female Sex Workers (FSW) or in Men who have Sex with Men (MSM) due to

unsafe sex and/or multiple partners [4-6].

Data in Africa confirm the high prevalence of STIs in this high risk group in Uganda, Kenya and Ivory Coast for example ranging from 3.1 to 28.4 [7-9]. However, even in Africa, the prevalence of *Chlamydia trachomatis* is widely different and varies, depending on the country, the study population, and the methods used to establish the diagnosis. In Senegal, only few publications are available regarding the prevalence of STIs in key population and especially *C. trachomatis* [10,11]. Moreover, these data are mainly related to STIs surveillance in MSM groups [11]. This study aimed to assess the prevalence of sexually transmitted pathogens in key populations attending the Institute of Social Hygiene hospital

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(IHS) in Senegal.

MATERIALS AND METHODS

This descriptive and retrospective study was carried out at the Institute of Social Hygiene hospital from January to December 2018. IHS is a level 2 hospital located in Dakar (Senegal), where key populations are followed.

Sampling approach

From each patient, 5 ml of venous blood was collected in an Ethylene Diamine Tetra Acetic Acid (EDTA) tube and plasma was used for serological detection of *Treponema pallidum* in both FSW and MSM, and *C. trachomatis* antibodies testing only for MSM group. In addition, genital sample was collected for other STIs agent detection. For each FSW, vaginal discharges were collected from exocol for *Trichomonas vaginalis* detection and endocervical swab were performed for *C. trachomatis* and *N. gonorrhoeae* detection. For MSM, urethral swab was performed for *N. gonorrhoeae* detection.

Laboratory methods for STI diagnosis

From serum, *C. trachomatis* antibodies were detected using enzyme-linked immunosorbent assay (lifespan BioSciences, Inc) and *T. pallidum* infection was diagnosed with a hemagglutination assay (SERODIA®-TP-PA; Fujirebio) and a Rapid Plasma Reagin (RPR) test (Becton Dickinson). *T. vaginalis* was detected by light microscopy on a saline wet preparation based on its particular mobility from exocol swab. *N. gonorrhoeae* was isolated from appropriate culture media under 5% of CO₂ prior its identification following microbiological standard procedures based on morphological, cultural, and biochemical characters. *C. trachomatis* antigen was detected using Enzyme Linked Immunosorbent Assay (IDEIA™, oxoid limited, United Kingdom).

Data analysis

SPSS version 20 software was used for statistical analyses, and a descriptive analysis was performed as well as bivariate logistic regressions. The level of significance for all statistical tests was set at $P < 0.05$.

RESULTS

A total of 214 patients with STIs symptoms (173 FSW and 41 MSM) have been included in this study and the diagnostic was established in 176 of cases (82%). Among them, 141 were FSW (80%) and 35 were MSM (20%). The mean age of the participants was 30 years for both groups ranging from 17 years to 48 years?

The table shows an overview of STIs pathogens detected with *C. trachomatis* (n=97; 55%), *N. gonorrhoeae* (n=32; 18%), *T. vaginalis* (n=26; 15%) and *T. Pallidum* (n=21; 12%) (Table 1). Interestingly, *C. trachomatis* infection was observed exclusively in FSW with 68.8%, and in all age groups. However, young FSW (less than 30 years) were more affected with 58.8% (57/97). In addition, no association between age groups and *C. trachomatis* infection was observed ($p=1.60$). Coinfection with *C. trachomatis* and other STIs causative agents was observed in 3.1% (3/97) for *N. gonorrhoeae*, 5.2% (5/97) for *T. pallidum*, 14.4% (14/97) for *T. vaginalis* and, 77.3% (75/97) were infected only by *C. trachomatis* (Table 2).

Table 1: Frequency of sexually transmitted pathogens.

STIs agents	All% (n/N)	FSWs% (n/N)	MSM% (n/N)
<i>C. trachomatis</i>	55 (97/176)	68.9 (97/141)	0 (0/35)
<i>N. gonorrhoeae</i>	18 (32/176)	3.5 (5/141)	77 (27/35)
<i>T. vaginalis</i>	15 (26/176)	18.4 (26/141)	-
<i>T. pallidum</i>	12 (21/176)	9.2 (13/141)	23 (8/35)

Table 2: Co-infections between *Chlamydia trachomatis* and other STI causative agents in FSW.

Micro-organisms	%(n/N)
<i>N. gonorrhoeae</i>	3.1 (3/97)
<i>T. pallidum</i>	5.2 (5/97)
<i>T. vaginalis</i>	14.4 (14/97)
<i>C. trachomatis</i> alone	77.3 (75/97)
Total	100 (97/97)

DISCUSSION

The aim of this study was to determine the proportion of STIs agents in two key populations (FSW and MSM) attending the Institute of Social Hygiene hospital in Dakar, Senegal. STI was detected among 82% of symptomatic patients with 80% of cases in FSW and only 20% in MSM. The proportion of STI in both groups was 81.5% (141/173) and 81.4% (35/41) in FSW and MSM, respectively. *C. trachomatis* was the most frequent pathogen involved in STIs (55%), followed by *N. gonorrhoeae* (18%), *T. vaginalis* (15%) and *T. Pallidum* (12%). A previous study showed already this high prevalence of *C. trachomatis* (28%) among non-registered FSW in Senegal [12]. A high prevalence of *C. trachomatis* in STIs was also observed in other studies in South Africa and Kenya with 41.7% and 48.3% respectively [13,14]. However, other studies have shown the predominance of other bacteria such as *T. pallidum* with 27% of prevalence, *T. vaginalis* (26.2%) or *N. gonorrhoeae* (16.2%) [15-17].

In this present study, *C. trachomatis* was exclusively detected among FSW (68.79%). Similar results were reported from previous studies carried out in France and Kenya showing a higher frequency of *C. trachomatis* infection in women [18,19]. These results could be explained by several factors related to the precocity of sexual activities for women, with more experienced and older partners, with the consequence to more likely to be infected compared to men. In addition, most of infected key populations (57.9%) are less than 30 years old as described in previous studies in Cameroon, Ethiopia and Mexico with less than 28, 21, 24 years respectively [20-22]. Confection with other STI causative agents were observed in 23% of infected patients. Interestingly, *T. vaginalis* was the most frequent STI pathogen detected in *C. trachomatis* co-infected FSW with (14.4%). Previous studies showed co-infection of *C. trachomatis* with other causative agents such as *N. gonorrhoeae* and *T. pallidum* [23,24].

CONCLUSION

In Senegal, prevalence of STIs, especially those due to *C. trachomatis*, is very high in key populations, particularly in FSW. Stigmatization and criminalization of this vulnerable group could contribute to the spread of these STIs in the general population because of their inaccessibility to health services. Thus, new screening strategies of these STIs in key populations should be developed to avoid the spread in general population.

Data availability

Data used to support the findings of this study are included within the article.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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