Prevalence of Chlamydia Infection Among Commercial Sex Workers in Benin City, Edo State, Nigeria.

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Abstract

Background/Objectives: Chlamydia infection is one of the sexually transmitted bacterial infections that causes severe and sometimes permanent damage to the reproductive system. Commercial sex workers are highly vulnerable to sexually transmitted infections such as chlamydia infection as it is mostly asymptomatic and shows similar symptoms with gonorrhea**:** This study's aim was to determine the prevalence of Chlamydia infection among commercial sex workers in Benin metropolis, Edo State, Nigeria. **Materials and methods:** Venous blood samples were collected from a total of 150 randomly selected and consenting commercial sex workers residing in Benin metropolis, Edo State, Nigeria into sterile plain containers and spun to obtain serum. The Chlamydia status of the participants was determined using Fich-Tech Chlamydia rapid diagnostic test kits. The results obtained were statistically analyzed. **Results and Conclusion:** The overall prevalence of Chlamydia infection obtained among commercial sex workers in our study was 20.7%. Chlamydia infection was more prevalent in female commercial sex workers (93.5%) compared to their male counterparts (6.5%). Chlamydia infection was also more prevalent in sex workers within the age grade 21 - 25 years (64.5%), 16-20 years age grade (19.4%) while aged grade 26-30 years and >40 years had the least prevalence (3.6%). Age and having multiple sex partners were associated with an increased risk for the acquisition of Chlamydia infection among commercial sex workers in this study. Public enlightenment on risk factors for the acquisition of chlamydia infection in the general population is strongly advocated.

Keywords: Benin Metropolis, Chlamydia infection, Commercial sex workers, Prevalence.

Introduction

Chlamydia is a bacterial infection caused by *Chlamydia trachomatis*. *Chlamydia trachomatis* is the most common sexually transmitted bacterial infection globally with new cases reaching an estimation of 4-5 million each year. [1] The incidence of *Chlamydia trachomatis* as estimated by the World Health Organization (WHO) is high in sub-Saharan Africa reaching more than 10 million new infections yearly (2). WHO states that an estimate of 50 million women were newly infected with chlamydia infection globally out of which 34 million occur in Sub-Saharan Africa. [2,3]

Infection with *Chlamydia trachomatis* causes infertility, pelvic inflammatory disease and ectopic pregnancy among young women. This usually occurs because Chlamydia has the ability to ascend from the cervix to the uterus, fallopian tubes and upper genital tract. [4,5] It is one of the most common sexually transmitted bacteria in young adults around the world and can also cause urethritis.in men. [4,6] The infection has been linked to an increased risk of cervical cancer and HIV infection. Young adults within the ages 15 and 24 years have

been observed to have the highest prevalence rates of Chlamydia infection. [4] Clinical signs and symptoms of *Chlamydia trachomatis* infection in the genitalia present as the chlamydia infection, which may be asymptomatic or may resemble a gonorrhea infection. [7]

Chlamydia infection is transmitted sexually through unprotected oral, anal, or vaginal sex or through genital contact; and this is most common among commercial sex workers. Female Commercial Sex Workers (FCSWs) engage in unprotected sex because they risk reduced payment or intimate partner violence during negotiations for safe sex with their routine clients or intimate sexual partners. Also, offers of higher monetary incentives for sex without condom further expose FCSWs to STIs. [8] Thus, FCSWs contribute significantly to sexually transmitted infections transmission through their frequent engagement in unprotected sex, multiple commercial sex partners, [9,10] and their lack of awareness that they have asymptomatic STIs. Many are yet to know of the Chlamydia infection as it is less popular compared to gonorrhea, syphilis and staphylococcus; And this can be due to the fact that Chlamydia infection is mostly asymptomatic and shows similar symptoms with gonorrhoea. There is high risk of those infected serving as reservoirs for transmission to their unsuspecting sexual partners as well as complications that can be encountered with chlamydia infection when undetected and untreated. This study therefore aims at determining the prevalence of Chlamydia infection among commercial sex workers in Benin metropolis, Edo State, Nigeria.

Materials and methods

Study Design

The study consisted of one hundred and fifty (150) commercial sex workers who use the services of some commercial hubs in Benin metropolis. The commercial sex workers were identified within the confines of 30 brothels in 4 local government areas within Benin metropolis, Edo State. The study referred to commercial sex workers as male and females who use the services of brothels and exchange sexual activities for material possession.

Data Collection

The commercial sex workers were surveyed by means of questionnaires completed on voluntary basis and conducted in English where necessary. Data were structured on socio-demographics, history of STD's, frequency of sexual intercourse and use of sexual protection.

Sample Collection

Blood samples of about 4mls were collected through venous procedure by trained laboratory scientists and dispersed into plain sterile bottles and centrifuged at 3,000rpm for up to 10mins to obtain the serum. The obtained sera were stored below -20℃ before sample analysis. The sera obtained were processed in the Medical Microbiology Laboratory of the University of Benin Teaching Hospital, Benin City Edo State, Nigeria.

Laboratory Analysis

The frozen sera were thawed at room temperature for about 45 minutes and then homogeneously mixed prior to laboratory analysis. The Fich-Tech Chlamydia Rapid Diagnostic kit, a rapid chromatographic immunoassay for the qualitative detection of *Chlamydia trachomatis* antigens in serum specimens were used in the diagnosis of Chlamydia infection. This test utilizes antibody specific for Chlamydia to selectively detect Chlamydia antigen from serum, producing results within 10 minutes.

Quality Control

The Fich-Tech Chlamydia Rapid Diagnostic test kit was used according to the manufacturer's instructions. The kits were stored at the manufacturer's recommended temperature (2-4℃). The Quality Control tag was checked to ensure it was not tampered with before purchase. Data accuracy was ascertained by double entry of all data obtained.

Statistical Analysis

Data collected were subjected to statistical analysis using the IBM SPSS statistics

software (Statistical Package for Social Sciences) version 27 and relevant statistical data were obtained. Results were presented as mean± standard error of mean (mean ±SEM). Differences in means were considered statistically significant at 95% confidence level (that is when probability was less than 0.05 ($P<0.05$).

Result

Prevalence of chlamydia infection among sex workers in Benin city.

Chlamydia infection was detected in 31 (20.7%) of the total 150 commercial sex workers in this study (Table 1). There was no significant association between gender of participants and the prevalence of Chlamydia infection among sex workers in Benin metropolis (p=0.336, OR=0.478, 95%CI-0.103-2.212) (Table 2). Chlamydia infection varied among the age grades, from 19.4% in Commercial sex workers aged 16-20 years to 64.5% in workers aged 21-25 years to 6.5% in workers aged 26-30 years and >40 years with 3.6% in C. workers aged 36-40 years. Age grade significantly influenced the prevalence of chlamydia infection among our study participants (P-0.009, OR – 0.004, 95% CI – 0.19- 1.87) (Table 2).

Previous history of STD's had no statistically significant effect on the prevalence of chlamydia infection among commercial sex workers in Benin metropolis (Table 3). Participants responded differently on the frequency of sexual intercourse as a risk factor for the acquisition of Chlamydia infection among commercial sex workers in Benin metropolis. Frequency of sexual intercourse had percentage influence on the prevalence of Chlamydia infection in this study (Table 4). There was no statistically significant difference between usage of sexual protection as a risk factor for the acquisition of Chlamydia infection among commercial sex workers in Benin metropolis (p=0.236, OR=0.608, 95%CI=0.226=0.389) (Table 5)

Discussion

Commercial sex workers usually have multiple sex partners which predisposes them to sexually transmitted infections such as C*hlamydia trachomatis* infection. Infection with *Chlamydia trachomatis* in most cases is asymptomatic making it easily spread without the infected persons knowing they have it. This study obtained a prevalence of 20.7% Chlamydia infection among commercial sex workers in Benin metropolis, Edo State. The value obtained in our study, though relatively high lies within the reported prevalence range of 6.9% to 56.0% Chlamydia infection obtained from previous studies conducted among females in Nigeria. [11,12,13,14,15] However, a higher prevalence of 68.5% was obtained among female sex workers in Niger Republic. [16] The differences in our results can be attributed to characteristics of the study population and the different diagnostic methods used.

In relation to gender, there was no significant association between gender of participants and the prevalence of Chlamydia infection among commercial sex workers in Benin metropolis. However, female participants had higher percentage prevalence than the males in the study population. Moreso, female commercial sex workers (FCSWs) are known to be at higher risk of contracting chlamydia infection [17] owing to their social vulnerability and commercial sex life such as: history of having multiple sexual partners, inconsistent use of sexual protection aid and previous history of having STD's. [18,19] Female commercial sex workers are known to aid in the spread of sexually transmitted infections to the general population through their clients. [9,10]

Commercial sex workers within the age grade 21-25years recorded the highest prevalence of Chlamydia infection (64.5%) followed by age grade 16-20 years (19.4%) while age grade 36-40 years recorded the least prevalence (3.6%). The findings from this research based on age has significant health implication because these young

commercial sex workers harbour the infection without knowing it and thus serve as reservoir for transmitting the Chlamydia infection to their sexual partners if left untreated. Age group 15-29 years have been established from previous studies as the ages with the highest rates of Chlamydia infection due to host related factors like the life number of sexual partners, use of contraceptives, sexual preference and mobility within the population. Other factors that aid in the spread of chlamydia infection in this age group include previous history of sexually transmitted diseases (STI's), low socioeconomic status of the study population, being HIV positive and having cervical ectopy. [20,21]

Although previous history of sexually transmitted infection (STI) is a risk factor predisposing individuals to the acquisition of chlamydia infection. The results from our study showed that previous history of STI's had no statistically significant effect on the prevalence of chlamydia infection among commercial sex workers in Benin metropolis. Frequency of sexual intercourse as a risk factor for the acquisition of chlamydia infection had percentage influence on the prevalence of Chlamydia infection in this study. Chlamydia infection is transmitted sexually through unprotected oral, anal, or vaginal sex or through genital contact; and this is most common among commercial sex workers. Many are yet to know of the Chlamydia infection as it is less popular compared to gonorrhea, syphilis and staphylococcus; And this can be due to the fact that Chlamydia infection is mostly asymptomatic and shows similar symptoms with gonorrhoea. There is high risk of those infected serving as reservoirs for transmission to their unsuspecting sexual partners as well as complications that can be encountered with chlamydia infection when undetected and untreated.

There was no statistically significant difference between usage of sexual protection as a risk factor for the acquisition of Chlamydia infection among commercial sex workers in Benin metropolis. In agreement to a study in Argentina. [22] Female commercial sex workers who did not stick to constant use of condom with their regular partners, had higher rate of *N. gonorrhoeae* and *C. trachomatis* infections when compared to those who used the condom consistently.

Limitations

The limitations in the research included amongst others, the research design, search for commercial sex workers and getting consent from the commercial sex workers

Conclusion

In conclusion, this cross-sectional study documented a high prevalence of *C. trachomatis* infections among commercial sex workers in Benin metropolis. Age and having multiple sex partners were associated with an increased risk for the acquisition of Chlamydia infection among commercial sex workers in this study. Public enlightenment on risk factors for the acquisition of chlamydia infection in the general population is strongly advocated. The findings of this study call for intervention measures that reduce the transmission of the infections and the importance of providing screening service for commercial sex workers to detect and manage asymptomatic cases.

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Data Availability: The data used to support

the findings of this study are available from the authors of this research upon reasonable request.

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Conflict of Interest: The authors declare that there are no conflicts of interest.

Ethical Approval: Permission was obtained from the Ministry of Health, Edo State for ethical approval to carry out this research within Benin metropolis. In addition, each of the participants was given a written consent form to fill to indicate their willingness to participate in the study.

Table 1. Prevalence of Chlamydia Infection among commercial sex workers in Benin Metropolis, Edo State, Nigeria

Variable	No Examined	Frequency (%)	p-value	Odds ratio	95% CI
Serology					
Positive	150	31 (20.7)	<0.0001	0.118	0.097-0.242
Negative	150	119 (79.3)			

Table 2. Sociodemographic parameters and Prevalence of Chlamydia infection among commercial sex workers in Benin Metropolis, Edo State, Nigeria

Variable	No Examined	No. Seropositive (%)	p-value	Odds ratio	95% CI
Gender					
Males	17	02 (6.5)	0.336	0.478	0.103-2.212
Females	133	29 (93.5)			
Age (Years)					
16-20	35	06 (19.4)	0.009	0.007	0.19-1.87
21-25	84	20 (64.5)			
26-30	26	02 (6.5)			
31-35	02	00 (0.0)			
36-40	01	01 (3.2)			
>40	02	02 (6.5)			
Total	150	31 (20.7)			

Table 3. Prevalence of Chlamydia infection among commercial sex workers in Benin metropolis, Edo State, Nigeria in relation to history of sexually transmitted diseases

History of other sexually transmitted disease	No Examined	No. Seropositive (%)	p-value	Odds ratio	95% CI
Yes	61	10 (32.3)	0.285	0.635	0.275-1.465
No	89	21 (67.7)			

Table 4. Frequency of sexual intercourse as a risk factor to the Prevalence of Chlamydia infection among commercial sex workers in Benin City, Edo State, Nigeria

Variable	No Examined	No. Seropositive (%)	p-value
Frequency of sexual intercourse per day			
3-4	50	11 (35.5)	0.369
2-3	30	04 (12.9)	
0-1	04	02 (6.5)	
Sometimes	66	14 (45.2)	

Table 5. Usage of sexual protection aid as a risk factor to the Prevalence of Chlamydia infection among commercial sex workers in Benin City, Edo State, Nigeria

Usage of sexual protection	Sample size	No. Seropositive (%)	p-value	Odds ratio	95% CI
Yes	105	19 (61.3)	0.235	0.608	0.266-1.389
No	45	12 (38.7)			

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