

PUS CELLS; CONFERRING SEXUALLY TRANSMITTED INFECTIONS IN ASYMPTOMATIC COMMERCIAL SEX WORKERS

AminaAbubakari^{1*}, OpokuBempah¹, Daniel Solaga²

¹Department of Laboratory Technology, Faculty of Health Sciences, Kumasi Polytechnic, Kumasi- Ghana.

²Department of Pharmaceutical Sciences, Faculty of Health Sciences, Kumasi Polytechnic, Kumasi- Ghana.

* Corresponding Author: AminaAbubakari

Email: abubakari.amina@kpoly.edu.gh, aminaabubakari@yahoo.com

Tel: +233-26-4250 658; Fax: +233-3220-22387

Abstract- *The study examined the distribution of pus cells in endocervical swabs in relation to the prevalence of Chlamydia and Gonococcal infections among commercial sex workers and non-sex workers in Kumasi, Ghana. Structured questionnaires were administered and laboratory analysis of endocervical swabs from commercial sex workers and non-sex workers were carried out to examine the presence of pus cells and to test for Gonococcal and Chlamydia infections. The study recorded 13% prevalence of chlamydia infection among commercial sex workers in contrast to 3% among non sex workers. One percent (1%) case of gonococcal infection was reported for commercial sex workers whereas none was reported for the non-sex workers. Meanwhile 16 % of the commercial sex workers had the presence of pus cells whereas 8 % was reported for the non sex workers. The study therefore noted that chlamydia infections were mostly prevalent in samples presenting with pus cells compared to samples without pus cells of the commercial sex workers as well as the non-commercial sex used as control.*

Keywords: Pus cells, endocervical swab, commercial sex workers, gonococcal, chlamydia

I. INTRODUCTION

Sexually transmitted infections (STI's) rates are the highest among population subgroups such as sex workers with high rates of partner change and unprotected sex (1,2). According to (3) the presence of STI increases the risk of acquisition and transmission of HIV. However, integrated services such as peer education, empowerment, condom promotion, and effective treatment for STIs along with structural interventions have demonstrated reductions in STI and HIV prevalence among sex workers (4). Asymptomatic STIs, more common in females, are usually managed through regular screening and presumptive treatment (5). (6) have evaluated various clinical strategies including one-time and periodic presumptive treatment used in different countries and have concluded that presumptive treatment should be included within a package of comprehensive STI services for sex workers. According to (7) cost-effectiveness studies among female sex workers (FSWs) in Madagascar and Bangladesh have reiterated the importance and utility of presumptive treatment for genital tract infections. Meanwhile the asymptomatic nature of genital chlamydial infections coupled with the occurrence of severe sequelae in untreated patients, makes the laboratory evaluation of great importance in the diagnosis of sexually transmitted diseases. Genital chlamydial infections are the leading cause of preventable sexually transmitted infections (STIs) worldwide (8). Chlamydial infections are associated with a 3-6-fold increase in the transmission of HIV infection and are attributed to be a risk factor for the development of cervical carcinoma (9).

Neisseria gonorrhoeae, another worth noting STI is associated with infections principally of the urethra in men and the endocervix in women, although it may also infect extra genital mucosal sites, including the oropharynx and anorectum. According to (10) ocular infections can also

occur, and in neonates can cause blindness due to ophthalmia neonatorum. (10) further affirms that Genital infections in men are usually presents with urethral discharge, but asymptomatic infections are common among women. (11) studied prevalence of chlamydia and gonococcal infections in women at risk of acquiring sexually transmitted infections in the Kumasi metropolis, Ghana. Chlamydia infection was found in 4.8% of participants whilst gonococcal infection was found in 0.9% of participants out of 1070 women who participated in the study. The prevalence of gonorrhoea and chlamydia among sex workers in India between 2000 -2009 ranged from 0 to 19.1% and from 0.9 to 22.6% (12), respectively.

Literature is bereft of information concerning distribution of pus cells and the prevalence of Chlamydia and gonorrhoea among commercial sex workers in Kumasi. This work therefore wants to contribute in that vein by comparing the distribution of pus cells and the prevalence of Chlamydia and gonorrhoea between asymptomatic sex workers and symptomatic non-sex workers.

II. MATERIALS AND METHODS

Study site

The study was conducted at the Microbiology Laboratory of Komfo Anokye Teaching Hospital (KATH), Kumasi.

Subjects

A total of 150 female were recruited for the study, comprising 100 asymptomatic commercial sex workers (CSW's) and 50 symptomatic non-sex workers (NSW's). Well trained personnel went round hotel streets, drinking spots and other night social gatherings to talk to females with multiple sex partners believed to be engaging in sex work for their livelihood. The commercial sex workers were

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considered asymptomatic because they showed no symptoms of the infection while the symptomatic women showed symptoms of STI's were recruited during their routine checkups at the STI unit of the hospital.

Selection of subject

Verbal consent was sought from both the women and those who gave their consent were included in the study. Ethical clearance was also obtained from the committee on human research, Publications and ethics, KNUST, SMS/KATH, Kumasi.

Specimen collection

Well-structured pre-tested questionnaires were administered to each of the women recruited for the study. Because the quality of specimen obtained is of much importance and determines the quality of the test, the specimen was taken with great care. First swab was taken to remove excess mucus from the exocervix by a well-trained nurse under the supervision of a doctor. After opening the vagina with speculum to see the endocervix, a second sterile cotton swab was inserted into the endocervical canal, past the squamocolumnar junction until most of the tip was no longer visible. The swab was then firmly rotated for 15-20 seconds and then withdrawn without contamination with exocervical or vaginal cells. The specimen was then tested immediately after collection.

Specimen processing

To establish the correlation between pus cells and the presence or absence of infection, prevalence of two most common STIs were determined in addition to the determination of the distribution of pus cells among the two groups of women. Two endocervical swabs were taken, after smear preparation and gram staining to establish the distribution of pus cell, one swab was used for gonococcal analysis and the other swab for Chlamydia analysis. Gonococcal analysis was performed by using the swab to prepare a culture on Thayer Martin's medium. This was then incubated at 37°C in a sealed jar with at least 70% humidity and 5 – 10% carbon dioxide by the introduction of a candle into the jar. The plates were examined after 48hours of incubation. Suspected colonies were purified and confirmed with oxidase test as well as carbohydrate utilization test. Presence of chlamydia was investigated using the other swab via the usage of *QuickVue Chlamydia* test kit. The kit is made up of extraction solution and neutralization solution as well as a *cassette*, which was employed for the investigation of the presence or absence chlamydial infection. The extraction solution usually designated reagent A was used to extract the endo-cervical specimen taken from the subjects; followed by the neutralizing solution also reagent B used to neutralize the prepared solution containing the sample. Three (3) drops of the prepared sample were added to the opened well shown in the cassette. The sample migrated through a label pad containing a monoclonal anti-*Chlamydia* antibody conjugated with a pink-Colorado test label and a blue-coloured label.

If the sample contained *Chlamydia* antigen, the antigen bound to the antibody coupled to the pink coloured test label which in turn, bound to a second monoclonal anti-*Chlamydia* LPS antibody on the membrane. If *Chlamydia* antigen-antibody complex was captured, a faint to dark red test line would be visible. A blue control line also appeared in the

result window indicating that right volume of clinical sample entered the test cassette and capillary flow occurred. If *Chlamydia* antigen was not present only a blue control line would be visible(13).

III. RESULTS

Table 1:Demographic characteristics presented by the 150 women included in the study

		Commercial sex worker	Non-commercial sex workers
		Frequency (%)	Frequency (%)
Age (years)	18 - 22	56	28
	23 - 27	29	28
	28 - 32	8	24
	33 - 37	7	20
	Total	100	100
Marital Status	Married	0	56
	single	100	40
	Widow	0	4
	Total	100	100
Educational Background	Literate	59	56
	Illiterate	41	44
	Total	100	100
Profession		19	
		36	
		0	
	Student	5	22
	Trader	40	60
	Housewife	100	8
Professional		10	
‘Purely Sex-work’		0	
Total		100	

Fifty-six percent (56 %) of the asymptomatic female commercial sex workers screened were between the ages 18-22, 29 % were between the ages 23-27, 8 % were also between the ages 28-32 and those who were between the ages 33-37 were 7 %. The study revealed that none of the commercial sex workers was married or widowed rather they were all single.

Considering educational background, 59% of them could read and write while those who could not read and write were 41%. The study also showed that 19% of the commercial sex-workers were students in different institutions, 36% were traders, none of them was a housewife, 5% were also into different professions and 40% were engaged in purely sex-work. However for the non sex workers, those within the ages 18-22 and 23-27 were 28 % in each range, 24 % was observed between the ages 28-32 and between the ages 33-37 was 20 %. Again 56 % of them were married, 40 % were singles and 4 % were widowed. Regarding the educational background, for the non – sex workers 56 % could read and write whilst 44% constitute those who could not read and write. Again 10 % of the same group was into various professions, 22 % were students in various institutions, 60 % were traders and 8 % were housewives.

Table 2: Correlation of pus cells to Chlamydia and Gonococcus infections

Result	Chlamydia	Gonococcus	Distribution of pus cells (%)		
CSW's	++ 9	+ 4	++ 0	+ 1	Chlamydia 16%
NCW's	3	0	0	8%	Gonococcus 0

Among the 100 asymptomatic CSW's screened 16.0% had pus cells with either ++ or +++ and out of this number 13.0% showed positive to *Chlamydia* infection and 1.0% gonococcal infection and Of the 50 symptomatic NSW's 8.0% had pus cells with either ++ or +++ and out of this number 6.0% were positive to *Chlamydia* infection and none was recorded for gonococcal infection

IV. DISCUSSION

Timely detection and effective management of STIs due to *Chlamydia trachomatis* and gonorrhoea in women provide critical intervention opportunities. (14) argues that although the gold standard for the detection of *Chlamydia trachomatis* has been culture, several clinical and technical factors can lead to false negative results even in expert hands. Moreover, the tissue culture setup is not available in most hospitals, hence, serological assays, which are much simpler and rapid, have been recommended as an alternative.

The prevalence of genital infection with Chlamydia and Gonorrhoea varies depending upon the population studied and the sensitivity of the laboratory methods used. The present study carried out revealed 13% prevalence of *Chlamydia trachomatis* in asymptomatic commercial sex workers in contrast to 3% in symptomatic non sex workers. A 1% case of Gonorrhoea was reported for CSW's whereas none was reported for NSW's. This was against the backdrop that 16% of CSW's had incidence of the presence of pus cell whereas 8% was reported for symptomatic NSW's. Higher prevalence

of 30.8% has been reported for *Chlamydia trachomatis* in Chennai, India (15).

A study from a UK hospital, where male partners of females with Chlamydial infection, both symptomatic as well as asymptomatic cases, were taken, have reported the prevalence as high as 44%. High rates of Chlamydia infection has been found to be among the 20-30 year age group (16). This is the sexually active group and is at a higher risk of being behaviorally more vulnerable to STI acquisition, as they generally have a higher number of sexual partners and more concurrent partnerships. This group also changes partners more often than older age groups. In similitude higher rates of STIs were found in commercial sex workers partly attributable to their high rate of partner exchange.

Literature is devoid of studies in Ghana that have reported the prevalence of *C. trachomatis* and gonorrhoea in symptomatic women. The reported prevalence of *C. trachomatis* infection is comparatively lower in several Eastern Mediterranean countries such as the one report from United Arab Emirates with 2.6% prevalence rate (17) also a study from Jordan among symptomatic patients reported 4.6% prevalence rate, (18) and in another study that compared infertility women with control group, reported 3.9% and 0.7% respectively (19). All these lower than values reported in the present study with a comparatively lower sample size.

According to (20) *C. trachomatis* infected people are likely to transfer infections and may remain undiscovered and therefore keep on spreading the infection to partners. Interventions of variable content may lead to favored changes in information, manner, awareness, self-efficacy, skills, and behaviors such as using appropriate procedures for contraceptive ways, sexually infection causes, and practice of protected sexual manners.

V. CONCLUSION

The study revealed that prevalence of Chlamydia infection was higher in asymptomatic commercial sex workers compared to symptomatic non-commercial sex workers. Generally, the prevalence of Chlamydial was comparatively higher than gonococcal infections in women. The prevalence of Chlamydial and gonorrhoea is not dependent on being symptomatic or asymptomatic. However the study found that the samples presenting with pus cells showed prevalence of infection.

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