PREVALENCE OF GENITAL CHLAMYDIA AND GONOCOCCAL INFECTIONS IN AT RISK WOMEN IN THE KUMASI METROPOLIS, GHANA

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Conflict of interest: None declared

SUMMARY
Objective: To study the prevalence of genital chlamydia and gonococcal infections in women at risk of acquiring sexually transmitted infections in the Kumasi metropolis, Ghana.

Design: Structured interviews and clinical examination of participants and obtaining vaginal swabs to test for gonorrhoea and chlamydia infections.

Participants: Women aged between 18-35 years (inclusive) with a history of having at least 3 sexual acts per week and having had at least 2 sex partners in the previous 3 months and were willing to be part of the study.

Results: One thousand and seventy (1070) women participated in the study. Genital chlamydia infection was found in 4.8% of participants whilst gonococcal infection was found in 0.9% of participants.

Conclusion: The prevalence of genital chlamydia and gonococcal infections was low in these at-risk women. The prevalence is also lower than reported in other female populations in the country.

Keywords: Chlamydia trachomatis, Neisseria gonorrhoeae, at-risk women, Kumasi metropolis

INTRODUCTION
Chlamydia trachomatis is a small obligate intracellular bacterium transmitted by sexual intercourse. It is a cause of endocervicitis and also pelvic inflammatory disease (PID) in women. Chlamydial infection of the genital tract is seen most frequently in young women who are sexually active. Most infections are asymptomatic and can lead to sequelae such as tubal damage, tubal infertility and ectopic pregnancy. In addition, untreated infections are estimated to increase the likelihood of HIV transmission. Neisseria gonorrhoeae is a gram-negative intracellular diplococcus (GNID) which causes disease only in humans. It is also sexually transmitted and infects the columnar epithelium of the endocervix in women. It can also infect the urethra and the rectum. About 50% of gonococcal infections in women are asymptomatic. Untreated gonococcal infections, like chlamydia, can lead to tubal damage and blockage, chronic pelvic pain, infertility and ectopic pregnancy.

In Ghana, only a few studies have been conducted into chlamydia and gonococcal infections. In these studies the prevalence of both organisms were found to be low compared to that found in some African states and the western world. Only one of these studies involved symptomatic patients attending a sexually transmitted infections (STI) clinic for one reason or the other. The others involved asymptomatic obstetric and gynaecologic patients.

Data from these studies suggested lower prevalence of these infections in women in the said low-risk populations. This study set out to study prevalence among women at higher risk of acquiring these infections.

METHODS
Women considered to be at higher risk of acquiring chlamydia and gonococcal infections were identified during field surveys of areas known to be receptive and conducive for sexual favours and activities in the Kumasi metropolis by trained field assistants. These areas included drinking bars, night clubs, female hostels and workplaces of apprentice seamstresses and hairdressers.

The inclusion criteria for recruitment were:
1. Age between 18 and 35 years (inclusive)
2. Vaginal sex of at least 3 times per week
3. At least 2 sexual partners in the previous 3 months

Once a participant was identified, the study was introduced to her and if she agreed to be part and met the eligibility criteria she was invited to the study office where written informed consent was obtained. Participants answered interviewer-administered questionnaires which sought information on socio-demographic data. This was followed by pelvic examination which involved the passage of a disposable speculum, inspection for any vaginal/cervical discharge/abnormality and the taking of swabs.
One endocervical (ECS) and 2 high vaginal swabs (HVS) were taken from each participant.

Of the 2 high vaginal swabs, one was used for the detection of *Chlamydia trachomatis* by a rapid immunoassay, *Quickvue* (Quidel Corporation, USA). This lateral flow test, with a reported sensitivity and specificity of 94% and 99% respectively in asymptomatic subjects detects the outer membrane protein of *C. trachomatis*. The endocervical swab was plated immediately on modified Thayer-Martin medium, put in a candle extinction jar and sent immediately to the laboratory to be incubated at 37°C for the growth and identification of *Neisseria gonorrhoeae*. Gonococci were identified by the observation of grey glistening colonies on the medium, which stained Gram negative with diplococcus morphology, tested positive with oxidase, and also utilized glucose but not maltose in sugar fermentation tests.

A smear of the second vaginal swab was made on a microscopic slide and gram-stained and bacterial vaginosis diagnosed by Nugent’s score. The swab was then immersed in a saline solution and *Trichomonas vaginalis* diagnosed from a wet mount.

**RESULTS**

One thousand, three hundred and fifty (1350) women were recruited into the study between April and November 2006. Two hundred and seven (207) declined to be screened for various reasons. Seventy-three (73) who were enrolled into the study were found to have had incomplete data entry and were therefore excluded from the final analysis. Results as presented are for one thousand and seventy (1,070) of the participants.

The age of participants ranged between 18 and 35 years with a mean of 22.7 years (SD--3.6). Nine hundred and forty-five (945) of the participants constituting 88.4% were single whilst 103 (9.5%) were co-habiting with a partner. Twenty-two (2.1%) said they were married. On contraceptive usage, whilst 31.7% used the condom, 16.2% were on the combined pill. Almost half of women enrolled (46.3%) were not on any form of contraception. Table 1 shows the sexual behaviour of the women. Eleven and half percent of participants had ever had anal sex whilst 42.3% had had oral sex in the past.

<table>
<thead>
<tr>
<th>Number of partners in last 3 months</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>935</td>
<td>87.4</td>
</tr>
<tr>
<td>4-5</td>
<td>134</td>
<td>12.5</td>
</tr>
<tr>
<td>6 and above</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>Mean</td>
<td>2.22</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>0.63</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency of vaginal sex in past week</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-6</td>
<td>913</td>
<td>85.3</td>
</tr>
<tr>
<td>7-10</td>
<td>147</td>
<td>13.6</td>
</tr>
<tr>
<td>11 and above</td>
<td>10</td>
<td>0.9</td>
</tr>
<tr>
<td>Mean</td>
<td>3.6</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>1.55</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 shows the prevalence of the two organisms in the population studied.

<table>
<thead>
<tr>
<th>Total number screened</th>
<th>Number positive</th>
<th>Number negative</th>
<th>% positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlamydia</td>
<td>1070</td>
<td>51</td>
<td>1019</td>
</tr>
<tr>
<td>Gonococcus</td>
<td>1070</td>
<td>10</td>
<td>1060</td>
</tr>
</tbody>
</table>

Table 3 shows the age-specific prevalence of the 2 organisms.

<table>
<thead>
<tr>
<th>Organism</th>
<th>18-20</th>
<th>21-25</th>
<th>26-30</th>
<th>31-35</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlamydia: Positive; n (%)</td>
<td>19 (37.2)</td>
<td>15 (29.4)</td>
<td>12 (23.5)</td>
<td>5 (9.8)</td>
<td>51 (4.8)</td>
</tr>
<tr>
<td>Negative; n</td>
<td>363</td>
<td>499</td>
<td>128</td>
<td>29</td>
<td>1019 (95.2)</td>
</tr>
<tr>
<td>Gonococcus: Positive; n (%)</td>
<td>4 (40.0)</td>
<td>4 (40.0)</td>
<td>2 (20.0)</td>
<td>0 (0.0)</td>
<td>10 (0.9)</td>
</tr>
<tr>
<td>Negative; n</td>
<td>378</td>
<td>510</td>
<td>138</td>
<td>34</td>
<td>1060 (91.1)</td>
</tr>
</tbody>
</table>

The prevalence of both organisms seems to fall with increasing age. The highest prevalence of both organisms was seen in the younger ages of 18-25. Whilst 80% of gonococcus was found in this age, chlamydia was found in 66.6%.

Vaginal discharge was found in 27.2% of participants. The major cause was bacterial vaginosis found in 20.5% followed by candidiasis in 18.7% and trichomoniases in 2.4%.
DISCUSSION

Chlamydia and gonococcal infections constitute the major cause of pelvic inflammatory disease. The prevalence of these organisms in most of West Africa is low compared to Southern and East Africa and the western world. In the work done by Pepin et al on women presenting with vaginal discharge in five cities in West Africa, chlamydia was found in 3.2% whilst the gonococcus was 1.9%. In some populations in East and Southern Africa, chlamydia had a prevalence of 5-11% whilst gonococcus was 7-17%. In Johannesburg, chlamydia was found in 13% of women attending an STI clinic.

A previous study in Kumasi reported a prevalence of 3.6% for chlamydia infections in patients presenting with infertility and for routine antenatal care. A study done on 162 women who attended the gynaecology clinic of Korle Bu Teaching Hospital, Accra, for various reasons found prevalence of 4.9% and 3.1% respectively for Chlamydia trachomatis and Neisseria gonorrhoeae. In the same study the respective prevalence among 148 postpartum women were 7.7% and 3.4%.

The current study found a prevalence of 0.9% for gonococcus and 4.8% for chlamydia and compares with that found by Appea-Kubi et al in ante-natal and gynaecologic women in Accra who had 3.0% prevalence of chlamydia and 0.6% of gonococcus. The latter study was on women presenting with symptoms including vaginal discharge. In our work, vaginal discharge was found in 27.2% of participants.

Studies have shown that a complex matrix of behavioural, biological and social factors contributes towards high risk sexual behaviour and the likelihood of acquiring STIs. These include younger age, the number of sexual partners at any given period, the use or otherwise of barrier forms of contraception, use of alcohol and other social drugs and economic disposition. In this study, participants by their sexual behaviour were considered to be at high risk for acquiring STIs.

These behaviours included a mean of 2.75 new sexual partners in the previous 3 months and 5.72 sexual acts in the previous one week, coupled with the fact that 46.3% were not using any form of contraception. A larger part of the infections was seen in the younger age group of 18-25 years.

As was also adduced by Adu-Sarkodie, reasons for the low prevalence of chlamydia and gonococcal infections in this study could be attributed to the more rampant use of unprescribed antibiotics, easy availability of over-the-counter drugs and syndromic management of STI. Health workers have over the past years been trained in syndromic management of sexually transmitted infections. In view of the low prevalence found in this study, one wonders whether we should be moving more towards aetiological management as opposed to syndromic management of STIs. Similar concerns have been raised by Pepin et al.

Although there has been a marginal decline of condom use among sexually active unmarried women in the country from 18% to 17.6% between 2005 and 2008 as reported by the Demographic and Health Surveys, condom use prevalence of 31.7% found in this study is very encouraging. The massive campaign against HIV/AIDS by the National AIDS Commission and National AIDS Control Programme, among others, may have raised awareness and increased the use of condoms as a preventive measure. This invariably would also have reduced the transmission of other STIs including chlamydia and gonorrhoea and could explain the low prevalence of these organisms in women who are at a higher risk of acquiring these infections.

CONCLUSION

The study found that the prevalence of genital chlamydial and gonococcal infections in women considered to be at higher risk of acquiring sexually transmitted diseases is low and comparable to the general population.

ACKNOWLEDGEMENT

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