Comparing STI Risk And Sexual Behaviour Profiles Of Pregnant Versus Non-pregnant, HIV Negative Black South African Women

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Article ID: WMC001142
Article Type: Research articles
Submitted on: 10-Nov-2010, 12:36:55 PM GMT   Published on: 10-Nov-2010, 07:04:20 PM GMT
Article URL: http://www.webmedcentral.com/article_view/1142
Subject Categories: PUBLIC HEALTH
Keywords: Sexually Transmitted Diseases, Condoms, Black women, South Africa


Source(s) of Funding:
The SISTA Project was funded by the NIH (grant #3P30 AI050409-06S1).

Competing Interests:
None
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Abstract

Background: In South Africa more HIV prevention efforts are focused on HIV positive and particularly pregnant women compared to HIV negative and non-pregnant women. The objective of this cross-sectional study was to compare the STI prevalence and sexual behaviours between HIV negative black women who attend HIV VCT services during antenatal care and their non pregnant counterparts.

Methods: A total of 446 women (Mean age = 23.37; SD = 4.21) completed an interviewer administered questionnaire. The interview assessed sexual and condom use behaviours. Participants also provided self-administered vaginal swabs for Chlamydia trachomatis (CT), Neisseria gonorrhoea (NG) and Trichomonas vaginalis (TV) tests.

Results: Compared to the non pregnant participants, the pregnant VCT attendees had a significantly lower average number of male partners in the past 6 months (AOR = 0.39; 95% CI: 0.17 to 0.89), had a lower rate of condom use (AOR = 0.32; 95% CI: 0.15 to 0.74), were significantly less likely to report a history of partner abuse (AOR = 0.38; 95% CI: 0.19 to 0.78) and to have asked their partner to use a condom (AOR = 0.52; 95% CI: 0.29 to 0.95). They were more likely to test positive for at least 1 STI and to report a STI history, however these were not significant.

Conclusions: The data highlight the urgent need to further explore the differences in profile of determinant of STI risk black pregnant and non pregnant VCT attendees in order to develop focused HIV prevention interventions to meet their different needs.

Introduction

Although South Africa is experiencing some of the highest HIV prevalence estimates in the world, recent projections indicate that the prevalence in the country is reaching a plateau and that antiretroviral treatment programs could have a significant impact on reducing the number of AIDS deaths per year. However, new incidence of HIV infection is still high and continues to be driven by the high HIV incidence among the 15-24 year age group, particularly among young women (Dorrington, Johnson, Bradshaw & Daniel, 2006).

In 2005, a survey which included a nationally representative sample of 15-24 year old young people estimated the annual HIV infection incidence at 3.3%, with females having a 8 times higher incidence compared to males (6.5% compared to 0.8%). The HIV prevalence among sexually active 15-24 year old females was estimated at 20.2%, and the prevalence for young females aged 25-29 was 33.3% (Shisana et al, 2005).

Voluntary counselling and testing for HIV service (VCT) is a critical entry point to a variety of HIV related services for HIV positive people. VCT centres are extensively supported by both government and non-governmental organisations (NGO) and provide opportunities for direct counselling and education on HIV risk and prevention options in South Africa. Various studies evaluating the effect of VCT on protective behaviours have found that VCT has a greater impact among HIV positive individuals compared to those who test HIV negative and untested individuals (Weinhardt, Michael, Johnson & Bickham, 1999). Following VCT, people who have tested HIV positive are more likely to significantly reduce their frequency of unprotected intercourse, increase condom use, and have a lower incidence of sexually transmitted infections (STI) compared to HIV negative and untested individuals (Mola, et al, 2006).

The acceptability of VCT among pregnant women attending public antenatal health services in African developing countries is reportedly 69% (Range, 33 - 95%) (Cartoux et al, 1998). As a result, HIV prevalence data from antenatal surveys is often more readily and regularly available than HIV data on non pregnant women (Garcia-Calleja, Gouws, & Ghys, 2006). The 2005 national antenatal survey estimated the HIV prevalence among pregnant women in public services at 30.2% which is higher than the 2005 national average of 24 % among black females in the 2005 household survey (South African Department of...
It is clear that, in South Africa, young black pregnant women should continue to be one of the foci of HIV prevention interventions as their risk to HIV is great (Gilbert & Walker, 2002). In this context where much more focus has been placed on HIV prevention among pregnant women, it is important to consider that in order to reduce incidence of HIV infection among black pregnant women and eventually children, black HIV negative, non pregnant women should an equally important target for intensive HIV prevention programs.

There is a paucity of published information about the impact of VCT on STI profiles and protective behaviours among black non pregnant VCT attendees. Furthermore, very little is known about the difference in STI profiles, risky sexual behaviour, determinants and barriers of protective behaviours between women who test for HIV as part of antenatal care and test HIV negative, and their non pregnant counterparts. This information will contribute new knowledge for the development of targeted post VCT interventions for black pregnant and non pregnant VCT attendees which will in turn improve VCT services’ capacity to positively impact on protective behaviour among women with HIV negative test results.

The objectives of this study were to compare the prevalence of STI Chlamydia trachomatis (CT), Neisseria gonorrhoea (NG) and Trichomonas vaginalis (TV), and psychosocial determinants of safe sex behaviours between women who were pregnant at time of VCT to the non pregnant women.

**Methods**

**Study Design and participants**

Data for this cross-sectional study was drawn from baseline measures of a randomized trial of a HIV risk reduction behavioural intervention among black isiXhosa speaking women in peri-urban areas of the Western Cape Province, South Africa. Participants were recruited from townships (formal and informal) of small semi-rural towns in the Western Cape Province.

The Western Cape Province is the second wealthiest in South Africa, has a generally better socioeconomic profile than other provinces. This is reflected in a health service delivery and health outcomes in general. It is highly urbanised with 87% of its population living in the Cape metropolis. Only 21% of the population is black, 54% are ‘coloured’ and rest are ‘white’ (Shaikh, Abdullah, Lombard, Smit, Bradshaw, & Makubalo, 2000). However, there are acute differences in health provision, health status and HIV prevalence that also run on racial, socioeconomic and locality-type lines. The 2004 prevalence of HIV in Cape Town was estimated at 3.7% in Cape Town central, 7.1% in Stellenbosch, 22% in Khayelitsha, 0.7% in Mitchel's plain and 16% in Gugulethu. Khayelitsha and Gugulethu are almost all black townships with large informal settlements where at least 50% of adults are unemployed (Shaikh, Abdullah, Lombard, Smit, Bradshaw, & Makubalo, 2006).

Recruitment into the study occurred between January 2006 and December 2007. Women were eligible to participate if they were black, isiXhosa speaking women aged between 18 and 35, sought voluntary counselling and testing (VCT) services at any one of 5 peri-urban primary health care clinics and had tested HIV negative in the previous 8 weeks. Participants were reassured that their identities would be treated as confidential.

All 446 women gave written informed consent to complete a behavioural questionnaire and provide 1 self administered vaginal swab. Participants completed an interviewer administered questionnaire and were guided to self administer a vaginal swab in a sterile manner (Van de Wijgert et al, 2006). The questionnaire was translated into isiXhosa by bilingual researchers and checked for linguistic appropriateness, comprehension, and cultural relevance, and then back translated from isiXhosa into English to ensure accuracy and meaning of constructs. The questionnaires were computer based (ACASI) and administered by trained, isiXhosa speaking, black female interviewers. This assessment procedure took about an hour to complete. Participants were given R20 (approx. $2.74) for completing the assessment procedures. Those who tested positive for any one STI were referred to a contracted medical practitioner in their respective areas, who supervised the uptake of single dose prescriptions of Azithromycin (1 g) for CT, Ciprofloxacin (500 mg) for NG or Metronidazole (2 g) for TV infection (Pepin & Mabey, 2003). The study protocol was approved by the Ethics Committee of the South African Medical Association (SAMA) prior to implementation.

**STI outcomes**

All participants’ vaginal swabs were tested for CT, NG, and TV. Tests for CT and NG were conducted using the COBAS Amplicor CT/NG PCR based assay (Roche Molecular Diagnostics) (Crotchfelt, Welsh, Debonville, Rosenstraus, & Quinn, 1997). The PCR test for TV was done using a PCR with the primers set TVK3/TVK7(Crucitti et al, 2003). STI results were coded 0 for a negative result and 1 for a positive result. The variable ‘Minimum of 1 STI’ was created from the
STI test results and denotes frequency of infection with at least 1 STI (coded Yes = 1 and No = 0).

**Questionnaire Instrument**

The questions included in this report are as follows:

*STI history* was assessed with the question “Have you ever had an STI?” (Coded Yes = 1 and No = 0). *Sex at last vaginal intercourse:* “The last time you had vaginal sex with your main partner, did you use a condom?” (Coded Yes = 1 and No = 0). *Number of sex partners:* “In the past 6 months, how many men have you had vaginal sex with?” *Pregnancy status:* “Are you currently pregnant?” (Coded Yes = 1 and No or don’t know = 0).

*Frequency of sex in past months:* “In the last 30 days, how many times have you had vaginal sex?”
*Frequency of condom use in past month:* “Of the number of times that you had sex in the last 30 days, how many times did you use a condom?” *Rate of condom use* was determined by dividing frequency of condom use in past month by frequency of sex in past months.

The following variables were intended to assess if women had attempted to negotiate condom use.

*Request for condom use:* “During the past 3 months, did you ask your main sexual partner to use a condom?” (Coded Yes = 1 and No = 0). *Frequency of requests for condom use:* “If yes, how many times did you ask your main sexual partner to use a condom?” *Frequency of request to apply condom on partner:* “During the past 3 months, how many times did you ask your main sexual partner if you should put the condom on him?”

*Inter-partner violence* was assessed with the question “Has your main sexual partner or any other partner ever kicked you, bit you, dragged you, or beat you up?” (Coded Yes = 1 and No = 0).

**Data analysis**

Frequencies and percentages or means and standard deviations (SD) were used to describe categorical or continuous variables respectively. Logistic regression was used to evaluate univariate relationships with pregnancy status. Those variables that had a significant univariate relationship with pregnancy status were included in the multivariate regression model. The relationships of these measures with pregnancy status were modelled in a multivariate logistic regression model. Significance level was set at the 5% level for all analyses. All analyses were conducted in SPSS version 15 (SPSS Inc., Chicago, IL).

**Results**

**Demographic profile**

The mean age of participants was 23 years old. The majority (88.42%) had entered secondary school and only 25.84% had at least a grade 12 level of education (Table 1). Most women were unemployed (75.28%) and financially dependent on a male partner (30.11%), parents or grandparents (26.97%), or other family members and friends (12.36%).

**Comparison between pregnant women and non-pregnant women on reported sexual behaviour and exposure to inter-partner violence (IPV)**

Univariate logistic models.

Univariate test of independence between pregnancy status and STI prevalence and questionnaire variable indicated that being pregnant was significantly associated with a higher frequency of vaginal sex, lower rate of condom use in the past 30 days, lower likelihood of using a condom at last intercourse, a lower reported number of partners in past 6 months (Table 2).

Pregnant women were significantly less likely to have asked a partner to use a condom in the past 3 months and those who did, requested condom use less frequently. However non pregnant women were significantly more likely to have been physically abused by a partner in the past and less likely to report a history of STI. The overall sample STI prevalence was 29.1%, 35.2%, and 12.6% for CT, TV and NG respectively. There was no significant difference in the prevalence of CT, NG or TV, between pregnant and non pregnant women.

Multivariate logistic model.

Variables that were significant in the univariate models were entered in the multivariate model. This model revealed that pregnant participants were significantly less likely to have asked partners to use condoms and had a lower rate of condom use. Pregnant participants were also more likely to report a STI although this was not significant. Non-pregnant women reported significantly higher average number of sex partners in the past 6 months and were significantly more likely to report having been physically abused by a partner (Table 3).

**Discussion**
The results of this study indicate that HIV negative and pregnant VCT clinic attendees are at higher risk for STI as compared to their non pregnant counterparts. However this risk does not appear to be due to multi-partner related behaviour on their part, but rather a failure in negotiating condom use, resulting in a lower rate of condom use and a higher risk of contracting a STI. Non-pregnant HIV negative women may be more likely to negotiate condom use; however the higher risk of physical abuse by their partners probably limits their ability to actually implement condom use in their relationships.

This is the first report of a comparison of sexual risk behaviour and STI profiles between HIV negative pregnant and non pregnant women in South Africa. HIV prevalence in South Africa is driven by the high incidence among young HIV negative women and is often discovered during antenatal care at which point an unborn child is also at risk of HIV. The results also reiterate the fact that pregnancy among HIV negative women is not a low risk period as pregnant women seem less likely to adopt protective sexual behaviours. Similar studies were conducted among adolescent girls in Connecticut and among women attending clinics in Brooklyn, USA and found that pregnant women were at higher risk of Chlamydia trachomatis infection, and used condoms less consistently than non pregnant women (Ickovics, Niccolai, Lewis, Kershaw, & Ethier, 2003; Wilson, Minkhoff, McCalla, Petterkin, & Jaccard, 1996).

The success rate of VCT in promoting protective behaviours among HIV negative individuals is reportedly lower than among HIV positive individuals (Weinhardt, Michael, Johnson, & Bickham, 1999). Therefore continuous, post-VCT counselling and follow up of HIV negative women is imperative to reinforce HIV prevention messages and to provide support for the various barriers to the adoption of safe sex options that they encounter in their relationships.

Pregnant women often establish a continuing relationship with health care services even after delivery. This presents an opportunity for the implementation of HIV prevention interventions with the aim of imparting and improving communication, negotiation and correct condom use skills that these women desperately need in order to successfully adopt protective behaviours in their relationships.

This study is further highlights the vulnerability of HIV negative non pregnant young black women in South Africa. The results indicate that non pregnant women had, on average, more sexual partner and were more likely to have experienced partner abuse. A possible explanation may be that non pregnant women engaging in risky sexual behaviours are bolder in negotiating condom use. The resistance of partners to use condoms and the risk of physical abuse compound these women’s risk to HIV and STI. A relationship between suggestion of condom use by women, multiple partner behaviour among women and domestic violence has been previously reported (Jewkes, Levin, & Penn-Kekana, 2003). Furthermore domestic violence has been previously shown to increase women’s risk to HIV by reducing their ability to use condoms consistently (Dunkle, Jewkes, Brown, Gray, McIntyre, & Harlow, 2004).

In South Africa much more focus has been placed on HIV prevention among HIV positive pregnant women. More efforts are needed to establish risk reduction and support programs to which HIV negative pregnant and non pregnant women could be referred to after VCT.

Although the use of contraceptives or women’s desire to conceive were not explored in this study, the results do suggest that it is necessary to reinforce the promotion of condom use among women attending family planning clinics as the only available method to protect against HIV infection and the importance of testing both partners for HIV when pregnancy is a desirable outcome.

It would have been very informative to have examined the effect of women’s desire for pregnancy and issues of trust in the primary relationship; however these variables were not explored. The interpretations of these results are limited to the population from which the participants were recruited and further research is needed into different populations of women in South Africa.

Conclusion

The results of this study highlight the differing STI risk profiles and intervention needs of pregnant and non pregnant HIV negative black women in South Africa. There is a need for developing targeted interventions among women VCT attendees. The results further suggest factors to be taken into consideration when developing intervention targeting HIV negative, specifically women VCT attendees in South Africa.

References

AIDS, 12, 2489-2493.


Illustrations

Illustration 1

Tables.

Table 1. Demographic Profile of Study Participants

*Note.* Reported percentages are based on the total number of respondents for which a score was available.

<table>
<thead>
<tr>
<th></th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years), mean (SD)</td>
<td>23.37 (4.21)</td>
</tr>
<tr>
<td>Highest level of education, n (%)</td>
<td></td>
</tr>
<tr>
<td>Primary School</td>
<td>51 (11.56)</td>
</tr>
<tr>
<td>Secondary School</td>
<td>276 (62.59)</td>
</tr>
<tr>
<td>Matric (Grade 12)</td>
<td>102 (23.13)</td>
</tr>
<tr>
<td>Tertiary</td>
<td>12 (2.72)</td>
</tr>
<tr>
<td>Employment status, n (%)</td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>96 (21.92)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>335 (76.48)</td>
</tr>
<tr>
<td>Self employed</td>
<td>7 (1.60)</td>
</tr>
<tr>
<td>Main source of income, n (%)</td>
<td></td>
</tr>
<tr>
<td>Job</td>
<td>77 (17.30)</td>
</tr>
<tr>
<td>Child grant</td>
<td>42 (9.44)</td>
</tr>
<tr>
<td>Disability grant</td>
<td>8 (1.80)</td>
</tr>
<tr>
<td>Sexual partner</td>
<td>120 (26.97)</td>
</tr>
<tr>
<td>Parents or grandparents</td>
<td>134 (30.11)</td>
</tr>
<tr>
<td>Family members or friends</td>
<td>55 (12.36)</td>
</tr>
<tr>
<td>Other</td>
<td>9 (2.02)</td>
</tr>
</tbody>
</table>
Table 2. Participants’ sexual behaviour, condom use and STI prevalence by pregnancy status with univariate tests of independence

<table>
<thead>
<tr>
<th></th>
<th>Pregnant</th>
<th>Non pregnant</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years), mean (SD)</td>
<td>23.34 (4.26)</td>
<td>23.78 (6.80)</td>
<td>0.99 (0.95 ; 1.02)</td>
</tr>
<tr>
<td>% condom use, past 30 days, mean (SD)</td>
<td>16.22 (32.29)</td>
<td>43.06 (46.81)</td>
<td>0.21 (0.12; 0.37)</td>
</tr>
<tr>
<td>Nº sex partners in past 6 months, mean (SD)</td>
<td>1.03 (0.21)</td>
<td>1.11 (0.43)</td>
<td>0.41 (0.21; 0.83)</td>
</tr>
<tr>
<td>Condom use at last sex, n (%)</td>
<td>34 (13.65)</td>
<td>62 (31.47)</td>
<td>0.34 (0.22; 0.55)</td>
</tr>
<tr>
<td>CT Positive, n (%)</td>
<td>75 (30.99)</td>
<td>50 (26.74)</td>
<td>1.23 (0.81; 1.88)</td>
</tr>
<tr>
<td>TV Positive, n (%)</td>
<td>91 (37.60)</td>
<td>60 (32.09)</td>
<td>1.28 (0.85; 1.91)</td>
</tr>
<tr>
<td>NG Positive, n (%)</td>
<td>24 (9.92)</td>
<td>30 (16.04)</td>
<td>0.58 (0.32; 1.02)</td>
</tr>
<tr>
<td>Min 1 STI, n (%)</td>
<td>136 (56.20)</td>
<td>101 (54.01)</td>
<td>1.09 (0.74; 1.60)</td>
</tr>
<tr>
<td>History of STI, n (%)</td>
<td>186 (74.70)</td>
<td>129 (66.15)</td>
<td>1.51 (1.00; 2.28)</td>
</tr>
<tr>
<td>Asked partner to use condom, past 3 months, n (%)</td>
<td>76 (30.52)</td>
<td>106 (53.81)</td>
<td>0.38 (0.26; 0.56)</td>
</tr>
<tr>
<td>Nº of requests to apply condom on partner, past 3 months, mean (SD)</td>
<td>0.55 (1.45)</td>
<td>1.06 (2.30)</td>
<td>0.86 (0.77; 0.96)</td>
</tr>
<tr>
<td>Physical abuse history, n (%)</td>
<td>22 (8.80)</td>
<td>31 (15.74)</td>
<td>0.52 (0.29; 0.93)</td>
</tr>
</tbody>
</table>
### Table 3. Results of Multivariate model of Sexual Behaviour, Condom Use Rate and STI Prevalence by Pregnancy status

<table>
<thead>
<tr>
<th></th>
<th>B coefficient</th>
<th>P</th>
<th>OR (95.0% C.I.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of partners</td>
<td>-0.94</td>
<td>.03</td>
<td>0.39 (0.17 ; 0.89)</td>
</tr>
<tr>
<td>Number of requests to apply condom on partner</td>
<td>-0.07</td>
<td>.30</td>
<td>0.94 (0.82 ; 1.06)</td>
</tr>
<tr>
<td>Physical abuse history</td>
<td>-0.96</td>
<td>.01</td>
<td>0.38 (0.19 ; 0.78)</td>
</tr>
<tr>
<td>STI history</td>
<td>0.46</td>
<td>.08</td>
<td>1.59 (0.95 ; 2.66)</td>
</tr>
<tr>
<td>Condom use rate</td>
<td>-1.11</td>
<td>.01</td>
<td>0.32 (0.15 ; 0.74)</td>
</tr>
<tr>
<td>Asked partner to use condoms</td>
<td>-0.65</td>
<td>.03</td>
<td>0.52 (0.29 ; 0.95)</td>
</tr>
<tr>
<td>Condom use at last sex</td>
<td>0.03</td>
<td>.95</td>
<td>1.02 (0.46 ; 2.30)</td>
</tr>
</tbody>
</table>

B. Regression coefficient

*P*  p value

O.R. Odds Ratio

C.I. Confidence Interval
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