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Vaginal Cleansing Practices in HIV Infected Zambian Women

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Abstract

Vaginal practices are a variety of behavioral techniques that women use to manage their sexual life and personal hygiene. Women perceive vaginal practices as a beneficial practice. However, vaginal cleansing has been identified as one of the main risk factors for bacterial vaginosis and is potentially implicated in Human Immune Deficiency Virus (HIV) and sexually transmitted infection transmission. This study examined the prevalence of vaginal practices and the types of practices used among a sample of HIV positive women living in Lusaka, Zambia. Over 90% of all women recruited engaged in vaginal practices. Certain practices, such as use of water or soap, were more frequently used for hygiene reasons. Herbs and traditional medicines were mainly used to please sexual partner. Strategies to decrease VP appear urgently needed in the Zambian community.

Keywords

Vaginal practices; HIV; Women; Africa; Bacterial vaginosis

Introduction

Vaginal practices are a variety of behavioral techniques that women use inside or outside the vagina to manage their sexual life and personal hygiene. In addition, in Sub-Saharan Africa, women engage in vaginal practices to promote “dry sex”, a practice that aims to increase pleasure to sexual partners by drying the vagina with cloths, herbs or other products applied vaginally as well as taken orally [1–5].

Women perceive vaginal practices, and in particular intravaginal cleansing, as a beneficial practice [6]. However, intravaginal practices (VP) and in particular vaginal cleansing, have been identified as one of the main risk factors for bacterial vaginosis (BV), the most common cause of vaginal discharge in women [7, 8]. BV has been associated with increased transmission and acquisition of Human Immunodeficiency Virus (HIV) and sexually

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transmitted infections (STIs) to sexual partners and newborns and with expression of HIV virus in the female genital tract [7, 9–11]. VP are therefore potentially implicated in STI and HIV transmission and could also affect the efficacy of vaginal microbicides, products aimed to protect women against HIV infection [12, 13].

Sub-Saharan Africa is the home of 27 million persons living with HIV and in Zambia; the prevalence of HIV infection is as high as 25%. The HIV epidemic is so widespread in this country that individuals aged 15 have more than a 50% risk of dying of Acquired Immunodeficiency Syndrome (AIDS) before the age of 35 [14]. In a country with such high rates of HIV infection, VP could contribute to the spread of the HIV epidemic. Little is known about VP in the Zambian community. The prevalence of dry sex has been reported as being about 50% but no detailed data exists on the use of other types of VP [15].

In this study we evaluate the prevalence of a variety of VP and describe the type of practices used in a group of HIV positive women in urban Lusaka, Zambia. We sought to identify those demographic and risk factors associated with vaginal discharge. In order to assess the potential impact of vaginal practices on HIV cervico vaginal lavage (CVL) viral load, we assessed the rates of BV and measured the HIV viral load using CVL among those women with vaginal discharge.

Methods

Participants were recruited from a Community Health Center in urban Lusaka, Zambia, and were 18 years of age or older, women, sexually active, HIV positive, not pregnant, and living in the Lusaka Metropolitan Area. A convenience sample was obtained using women attending the Community Health Center; participants were primarily self-referred after hearing about the study from other participants. Study staff screened potential participants. Those eligible completed all assessments at the time of enrollment. This study used a cross-sectional design.

Ethical Approval

Institutional Review Board (University of Miami Miller School of Medicine) and Research Ethics Committee (University of Zambia) approvals and client informed consent were obtained before recruitment, assessment and any study related intervention.

Study Procedures

Participants were administered questionnaires assessing demographic, sexual risk factors and VP. The VP questionnaire was developed using responses obtained from focus groups conducted in Community Health Centers. Questions were related to the introduction of products inside the vagina and not to external vaginal cleansing. Questionnaires were administered by the study coordinator who was fluent in the language of preference of the enrolled participants (Nyanja, Bemba and English).

Sixty HIV infected women were screened for self-reported vaginal discharge (vaginal itching, vaginal discharge or vaginal odor). Women ($n = 40$) that reported any vaginal discharge underwent a vaginal examination and collection of fluids by CVL. Vaginal infections were diagnosed by wet mount examination. BV was diagnosed using the Amsel criteria and other abnormalities in the vaginal exam were also recorded. CVL was performed by instilling 10 cc of sterile saline solution into the vaginal and cervical areas and aspirating after 60 s. Samples were transported on ice to the Center for Infectious Diseases Research in Zambia (CIDRZ) for analysis.

Outcome Measures

Demographics and Sexual Risk Factors—This questionnaire included age, religion, ethnicity, educational level, employment status, residential status, date of HIV infection, mode of infection with HIV, current or previous drug use/abuse, marital status/current partner status, living situation, number of children and children's serostatus, use of condoms, sexual modalities (oral, anal sex), history of exchanging sex for money.

Vaginal Practices—This questionnaire assessed the participant's reasons for the use of VP across three domains: hygiene (to clean, remove odor, decrease discharge and itching, cleansing after menses), health (to avoid pregnancy, STI or HIV infection) and perceived sexual partner preference. Questions to assess use, reason for use, product used and perceived sexual partner preference were on a dichotomous scale, “yes” = 1, “no” = 0. Questions assessing recency of use were scored using a Likert-like scale, “within the last week” = 1, “within the last month” = 2, “within the last 1–6 months” = 3, “within the last 6–12 months” = 3, “more than 1 year ago” = 5. Questions assessing frequency of use was scored using a Likert-like scale, “every day” = 1, “once a week” = 2, “once a month” = 3, “every 2–6 months” = 4, “once a year” = 5. Subscales were created for the domains hygiene (range = 1–5) and health (range = 1–3) by adding the individual items.

Vaginal Infections—Bacterial vaginosis, candida vaginitis or trichomoniasis were diagnosed using wet mount examination and Amsel criteria. Outcomes are presented as present or absent.

Laboratory Assessments—Cervico vaginal lavage and plasma HIV RNA viral load. Real-time PCR Abbott M2000® automated system was used to assess CVL and plasma HIV RNA viral load. Vaginal samples (10 cc) were isolated, aliquoted into eppendorf tubes and directly used for determining viral load. Testing was conducted at CIDRZ laboratories. Validation studies were performed to determine CVL viral load measures. Outcomes are presented as detectable or undetectable.

Statistical Analysis

Predictive Analytics Software 18 (PASW®) statistics was used for analysis. To assess relationships between variables, risk ratios were calculated between variables of interest, e.g., vaginal discharge, demographics, risk factors, VP. Correlations were conducted using Pearson's correlation and Spearman's ranking test; univariate analysis using odds ratios and χ^2 were used to determine factors associated with vaginal discharge. A P value of less than 0.05 was considered to be significant. Logistic regression was performed to analyze the impact of reasons for VP on vaginal discharge. Significance was determined using Wald test. The use of VP by domains, products and age were independent variables in the model.

Results

Demographics and Risk Behavior

Sixty women were recruited. Baseline characteristics are described in Table 1. The mean age was 37 years. Most women were long term HIV infected, unemployed, with very low income, married and living with a stable partner in a monogamous relationship. The majority (75%) had an HIV positive partner and identified unprotected heterosexual intercourse as the mode of HIV infection. Almost 80% reported consistent condom use and low rates of alcohol or drug use were reported.

Vaginal Practices

Reasons for use and beliefs regarding vaginal practices are described in Table 2. Ninety three percent of participants reported they engaged in VP and were introduced to VP at a young age. The most common reasons for such practices were related to hygiene and health. Over one third of women reported that they engaged in VP to please their partners. Over 50% of women believed that VP were beneficial and that their partners would “not like” them to discontinue their VP, though many (32%) had previously been counseled to discontinue their use. Products used and frequency of use and reason for use are described in Table 3. Water, soap and fabrics were used primarily for hygiene purposes; herbs and traditional medicines were used primarily to please partners by drying or warming the vagina. Most women that reported using water, soap or fabrics had done it in the prior month. No women reported using any of the products evaluated for health related reasons.

VP, BV and HIV CVL Viral Load

Most women with vaginal discharge (85%) had BV and 15% had candida vaginitis. No trichomoniasis was found. One third of women had detectable plasma HIV viral load (30%) and 15% had detectable CVL viral load. Two women with BV had high levels of HIV RNA CVL viral load and non detectable HIV viral load in plasma. No association was found with VP, BV and CVL viral load.

Relationship between Vaginal Discharge, Demographics and VP

Factors associated with having vaginal discharge are shown in Tables 4 and 5. The presence of vaginal discharge was associated with the use of VP for hygiene in univariate analysis ($P < 0.05$). There was a trend of association between the use of VP for the purpose of pleasing partners and having a vaginal discharge in a logistic regression model ($P = 0.08$).

Exploratory Analyses

In order to examine the relationship between having been previously advised to discontinue the use of VP prior to entering the study and women's subsequent behavior as noted at study entry, we examined the current use of VP and the reasons for use of VP. We selected those women who had been advised prior to entering the study to discontinue VP (32.2%, $n = 19$), and found 77% had continued the use of VP. Among those women, reasons reported for the current use of VP were not significantly different from those who did not report being advised to discontinue their use.

We then examined the endorsement of reasons for the use of VP in the domains of hygiene (90%), health (72%) and partner pleasure (35%). We conducted χ^2 analysis comparing those women who had been advised not to engage in VP with those who had not been advised against its use, and did not find a significant difference between these groups, though use of VP for health was approaching significance ($\chi^2 = 2.3$, $P = 0.13$).

Discussion

This study examined the prevalence of vaginal practices and the types of practices used among a sample of HIV positive women living in Lusaka, Zambia. Additionally, it identified the prevalence of BV and sought to clarify the relationship between VP and vaginal discharge, as well as VP and HIV viral load in the vagina among those women having vaginal discharge.

High rates of vaginal practices have previously been reported in other studies in Sub-Saharan Africa. Most studies have found that commercial sex workers and HIV negative women also have high rates of VP. For example, a recent study by Allan et al. [3] found

75% of women in Tanzania reported VP, mainly with soap and water and for hygiene purposes. Similarly, among HIV negative women in a family planning clinic in Zimbabwe, over 60% of the studied women reported VP and the use of cloth to clean [16]. Among commercial sex workers in Kenya, 75% also reported VP [5]. Women in our study had higher rates of VP than previously reported in other studies, which could indicate that such practices are more common among HIV positive women. Certain practices, such as use of water or soap, were also frequently used (e.g., more than once a week). This high prevalence of VP in HIV positive women could increase rates of HIV transmission to sexual partners and newborns. As over 90% of all women recruited engaged in VP, regardless of vaginal discharge, it is impossible to know if VP caused vaginal discharge or vaginal discharge was the reason why women engaged in VP.

This report also evaluated the beliefs and perceptions of women regarding VP. Most women considered VP beneficial and use them for hygienic or “health” purposes. An alarming finding is that over two thirds of women used VP with the belief that it would decrease the risk of STI or HIV and avoid pregnancy. In contrast to this belief, a recent meta-analysis of intravaginal practices, vaginal infections and HIV acquisition indicated that certain vaginal practices are in fact harmful and increase the risk of acquiring vaginal infections and HIV [12, 13].

Equally important is that prior to enrollment in the study, approximately one third of women had been told to discontinue VP but continued to engage in its use. Prior studies have shown that counseling about reduction of VP did not result in a decrease in such practices. In 2010, Gallo et al. reported that rates of VP continued to be high in a group of women instructed not to clean with a diaphragm in place. Women endorsing use of VP despite counseling regarding its harm prior to this study reported engaging in VP for hygiene, health and partner preference. These beliefs were identical to those reported by those women who had not been counseled against its use prior entering the study. Clearly, interventions providing information are necessary but may not be sufficient to deter VP, especially in this population. Additionally, perception of partner preference also suggests that couples interventions may be needed to reduce the use of VP. A behavioral intervention, as part of HIV prevention strategies for both men and women, may decrease this high risk practice in the Zambian community.

Not surprisingly, BV rates among those women with a vaginal discharge were high. Similarly, Fonck et al. [5] found that BV was more prevalent in HIV positive female sex workers in Kenya, with rates approaching 60%. In contrast, Kapina et al. [17] found rates lower than 10% among Zambian HIV negative women in Lusaka. Higher prevalence of BV among HIV positive women has the potential to increase the risk of perinatal and sexual HIV transmission.

Most women had undetectable HIV plasma viral load, and there was no association between HIV RNA viral load in the CVL and the presence of discharge, BV or VP, though two women with BV had very high viral load in the vagina despite having an undetectable level of VL in plasma. These results may be due to the limited sample size. Cu-uvin et al. [11] found that BV was associated with increased expression of HIV-1 RNA viral load in the female genital tract, more prominent in women with detectable plasma HIV RNA viral load.

As noted above, the major limitation of this study is the small sample size. In addition, as in most sexual behavior studies, self-reported evaluation of VP and risk factors are subject to recall biases. Another limitation is the use of Amsel criteria to diagnose BV; higher rates might have been obtained using a more sensitive diagnostic test such as nucleic acid amplification tests (NAAT), especially in detecting BV in asymptomatic participants. In

addition, we did not assess those women not presenting with a vaginal discharge for asymptomatic vaginal infection, which precluded us from conducting associations of BV with vaginal practices among these participants. Finally, we did not assess for the use of antiretroviral medications, which may have influenced the viral load measures obtained. Research including measurements of vaginal cytokines and other inflammatory markers, as well as tissue markers, are needed to further clarify the relationship between VP, BV and HIV transmission.

Conclusions

Strategies to decrease VP appear urgently needed in the Zambian community. Diagnosis and treatment of BV should be considered as an element of the standard of care for HIV positive women in this setting. Further studies should evaluate the potential for behavioral interventions to influence women's beliefs regarding the beneficial nature of VP, and their use for cleansing and pleasing sexual partners. The integration of men in such initiatives may enhance behavioral change in this community.

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Table 1

Baseline Socio-demographic characteristics and risk behaviors in the study population (n = 60), (number, %)

Age	37 years (20–61)
Married	47, 78.3%
Christian religion	60,100%
Unemployed	48, 80%
Yearly income less than $5000	56, 93.3%
Secondary education	36, 60%
Living with partner	46, 76.7%
Living with children	53, 88.3%
HIV positive children	9, 15%
Trying to get pregnant	8, 13.3%
Planning to have more children	10, 16.7%
HIV positive partner (n = 36)	27, 75%
Time since HIV diagnosis	
Less than 2 years	8, 13.3%
Two to 5 years	30, 50%
More than 5 years	22, 36.7%
Mode of HIV infection	
Sexual	45, 75%
Unknown	15, 25%
Sexual risk behaviors in the past month	
100% condom use	47, 78.3%
Intercourse more than 4/month (n = 37)	9, 24.3%
Use of alcohol (n = 37)	3, 8.1%
Use of drugs (n = 37)	1, 2.7%
Monomogamous relationship (n = 37)	37, 100%
Oral sex (n = 37)	37, 100%
Anal sex (n = 37)	1, 2.7%
Exchange sex for money	1, 1.7%

Table 2

Percentage of responses regarding VP: use, age of initiation, reasons for use and women's beliefs ($n = 60$)

Have you ever used VP ($n = 60$)?	56, 93.3%
How old were you the first time you used VP?	23 years (15–41 years)
What are the reasons why you used VP?	
Hygiene	90%
Health	71.6%
Partner pleasure	35%
Women's perceptions about VP	
Are beneficial ($n = 59$)	37, 62.7%
Cause discharge or odor ($n = 59$)	4, 6.8%
Decrease risk of STI ($n = 59$)	12, 20.3%
Decrease risk of transmitting HIV ($n = 59$)	16, 27.1%
Partner will not like if discontinued ($n = 54$)	31, 57.4%
Have you ever been told to discontinue VP? ($n = 59$)	19, 32.2%

Table 3

Percentages of responses among women using a specific product for VP

Water (*n* = 57, 95%)	
Have you used water in the last month?	93%
Do you use water once a week or more often?	78.9%
Why do you use water?	
Hygiene	100%
Health	0%
Partner pleasure	0%
Soap (*n* = 12, 20%)	
Have you used soap in the last month?	99.7%
Do you use soap once a week or more often?	66.7%
Why do you use soap?	
Hygiene	100%
Health	0%
Partner pleasure	0%
Herbs (*n* = 19, 31.6%)	
Have you used herbs in the last month?	26.3%
Do you use herbs once a week or more often?	15.7%
Why do you use herbs?	
Hygiene	31.6%
Health	0%
Partner pleasure	68.4%
Fabric or cotton (*n* = 13, 21.7%)	
Have you used fabric or cotton in the last month?	69.2%
Do you use fabric or cotton once a week or more often?	15.4%
Why do you use fabric or cotton?	
Hygiene	92.3%
Health	0%
Partner pleasure	7.7%
Traditional medicines (*n* = 7, 11.6%)	
Have you used traditional medicines in the last month?	14.3%
Do you use traditional medicines once a week or more often?	14.3%
Why do you use traditional medicines?	
Hygiene	33.3%
Health	0%
Partner pleasure	66.7%

Table 4

χ^2 and odds ratios of having vaginal discharge ($n = 60$)

	OR (95% CI)	χ^2 (*P* value)
Demographics		
Age less than 25 years	3.7 (0.8–17.3)	3.07 (0.07)
Married	1.05 (0.98–1.15)	0.69 (0.40)
Yearly income less than $5000	1.04 (0.98–1.15)	0.70 (0.40)
HIV positive children	2.58 (0.29–22.8)	0.76 (0.38)
HIV positive partner	2.94 (0.31–28.02)	0.94 (0.33)
Sexual risk behaviors		
Intercourse more than 4/month	0.54 (0.10–2.85)	0.5 (0.46)
Use of alcohol	0.72 (0.58–8.9)	0.66 (0.78)
Use of drugs	1.03 (0.96–1.12)	0.38 (0.53)
100% condom use in last month	0.34 (0.6–1.93)	1.56 (0.21)
Vaginal practices		
Ever use of vaginal VP	11 (1.04–115.5)	5.70 (0.01)*
Use of VP for hygiene	22 (2.3–209)	12 (0.003)*
Use of VP for health	0.55 (0.13–2.28)	0.68 (0.33)
Use of VP to increase partner pleasure	1.15 (1.03–1.29)	2.22 (0.13)
Use of water	6.76 (0.56–8.75)	2.92 (0.08)
Use of soap	0.5 (0.12–1.98)	1.11 (0.29)
Use of herbs	1.37 (1.00–1.88)	2.65 (0.10)
Use of cloths	1.27 (1.01–1.58)	2.65 (0.10)
Use of traditional medicines	1.18 (1.05–1.34)	2.12 (0.14)

Table refers to OR and 95% confidence interval

*Refers to *P* value of less than 0.05

Table 5

Logistic regression predicting likelihood of having a vaginal discharge

	Odds ratio	*P* value	95% CI
Age less than 25 years	2.35	0.39	0.32–17.11
VP for hygiene	6.51	0.15	0.51–83.17
VP for pleasure	7.41	0.08	0.07–72.5
Use of water for VP	3.39	0.56	0.05–219.18
Use of herbs for VP	1.29	0.79	0.18–9.18
Use of cloths for VP	1.99	0.59	0.16–23.80

Adjusted for variables included in table. Significance assessed using Wald test