

Survey on Intravaginal Practices among Women of Reproductive Age at the Gynaeco-Obstetric and Pediatric Hospital of Yaounde: Association with Bacterial Vaginosis Caused by *Gardnerella Vaginalis* and *Mobiluncus*

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ABSTRACT

Background and objectives: Intravaginal practices are quite common among women worldwide and expose to bacterial vaginosis. The aim of our study is to evaluate the prevalence of intravaginal practices in women of childbearing age who came for consultation at the Gynaeco-Obstetric and Pediatric Hospital of Yaoundé and to determine its association with bacterial vaginosis.

Methods: We conducted a prospective and cross-sectional study among 212 women from April 12 to July 30, 2021. Each participant was submitted to a questionnaire and was taken a vaginal swab. For the diagnosis of bacterial vaginosis, we made a flame-fixed slide smear and then stained by Gram's method. We classified the vaginal flora into four types according to Thomason and to make the diagnosis of bacterial vaginosis.

Results: The prevalence of intravaginal practices was 54.7% among participants. The dominant type of intravaginal practices was scraping the vaginal walls with fingers (85.34%), followed by vaginal douching (6.03%). Women aged 26 to 33 were more adept at intravaginal practices (36.20%) followed by women aged 18 to 25 (34.48%) but the difference was not significant. Regarding the level of education, university-level women were more represented concerning the intravaginal practices (52.58%) followed by secondary school women (39.65%) but the difference observed was not significant. 38.79% and 1.72% of women performing intravaginal practices suffered from *Gardnerella vaginalis* and *Mobiluncus* infections respectively against 37.5% and 4.16% of *Gardnerella vaginalis* and *Mobiluncus* infections respectively in those who did not perform intravaginal practices; however, intravaginal practices was not statistically related to *Gardnerella vaginalis*, *Mobiluncus* and HIV infection ($p=0.847$; $p=0.286$, $p=0.296$) respectively).

Conclusion: These intravaginal practices are common among women and were not statistically related to bacterial vaginosis flora or HIV infection. Women should be educated about maintaining their vaginal cavity to avoid vaginal infections.

KEYWORDS: bacterial vaginosis- women- *Gardnerella vaginalis*- *Mobiluncus*- HIV

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INTRODUCTION

Intravaginal practices (IVP) are very common cultural habits and customs among women around the world. In the United States in 2014, the overall prevalence of douching was 22.4% [1]. In 2007 during a household survey in native Kwazulu in South Africa, the authors reveal that most women routinely

perform IVP; 90.2% [2]. Luo et al. (2016) after a study of 837 sex workers in the province of Yunnan in China declare that 84% of them are followers of IVP [3]. Smith et al. (2010) report in their study that 9.2% insert traditional products, 17.3% clothes, 6.2% paper into their vaginal cavity [2]. Turner et al (2010) found that 84% of women reported ever

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cleansing inside the vagina, and at 40% of visit women reported drying the vagina using cloth or paper [4]. In Guinea, Senegal, Mali some women introduce a ball of black grass coated in shea butter in their vaginal cavity a few hours before sex [5]. In Cameroon, in a study of 300 women in the city of Douala in 2016, Mogtomo et al. (2016) reported that 22.3% of these women practiced douching (6). These IVP consist of douching with simple water, or soapy water, or with commercial antiseptic preparations, either scraping the vaginal walls with the fingers or the intromission of herbs, or paper and pieces of tissue in the vaginal cavity [1, 7]. The motivations expressed by these women are of a hygienic nature: they seek to eliminate odors and leucorrhoea [1]. Francis et al. (2013) stated in a survey of sex workers that they do PIV for hygienic reasons and to limit sexually transmitted infections [8]. Numerous studies have shown that IVPs are a risk for the acquisition of bacterial vaginosis (BV) since they increase the risk of disruption of the vaginal flora [9]. The vaginal cavity is mostly colonized in its normal state by lactobacilli which ensure the maintenance of vaginal ecology and prevent vaginal infections by the production of hydrogen peroxide, lactic acid which maintains a pH between 3.2 and 4.2 unfavorable to bacterial growth and bacteriocins that inhibit bacterial growth [9]. BV is the most common form of genital infection and one of the most common causes of vaginal discharge in women during reproductive activity [10]. Worldwide, it has been estimated that 20-30% of women of childbearing age with a sexually transmitted infection have bacterial vaginosis, and its prevalence ranges from 50-60% in some populations; such as sex workers [11]. A study conducted by Kechia et al. (2015) in Yaoundé found a prevalence of bacterial vaginosis of 26% [12]. According to Mbizvo et al. (2004), women who performed intravaginal practices are more at risk of bacterial vaginosis [13] and Low et al. (2011) in their study make the same observation [14]. A study of female sex workers in Kenya reported a gradual increase in bacterial vaginosis with increasing frequency of IVP [15]. Clark et al. (2007) reported that several studies have linked these practices to several adverse health outcomes such as bacterial vaginosis and pelvic inflammatory diseases [16]. The aim of our study is to evaluate the prevalence of intravaginal practices in women of childbearing age who came for consultation at the Gynaeco-Obstetric and Pediatric Hospital of Yaoundé and to determine its association with bacterial vaginosis due to *Gardnerella vaginalis* and *Mobiluncus*.

MATERIAL AND METHODS

We conducted a prospective and cross-sectional study from April 12 to July 30, 2021. Our study took place within the Gynaeco Obstetric and Pediatric Hospital of Yaoundé. We have obtained from the Institutional Ethics Committee for Human Health Research of this Hospital a research authorization (CIERSH): 058/CIERSH/DM/2021. Written

and informed consent was obtained from each participant. The size of our sample (212 women) was calculated by the Lorentz formula from the prevalence of bacterial vaginosis obtained by Payne et al. (2020) in his study in Dschang [17]. Were included in the study all women of childbearing age, aged 18 to 48 who were to undergo a cervico-vaginal sampling and who had given their informed consent. The women excluded from the study were those on antibiotics, postmenopausal and those who did not return for a sample after being discharged overnight for vaginal cleansing. Each participant was submitted to a questionnaire which contained socio-demographic data (age, profession, region of origin, religion, level of education, marital status), habits of intravaginal practices (type of intravaginal practices performed, reasons to perform these intravaginal practices), HIV/Aids status, and medical history (medications taken) and was taken a vaginal swab. For the diagnosis of bacterial vaginosis, we made a flame-fixed slide smear and then stained by Gram's Method [18, 19]. Then we made a microscope observation at the 100 objective with immersion oil. This observation allowed us to classify the vaginal flora into 4 types according to Thomason [18, 19] and to make the diagnosis of bacterial vaginosis [18, 19]: Type I flora: predominance of the Doderlein flora. Type II flora: majority Doderlein flora, but existence of a substitution flora without dominant morphology. Type III flora: flora of bacterial vaginosis with rarefaction of the Doderlein flora with appearance of a substitution flora with dominant morphology. Type IV flora: flora of bacterial vaginosis with complete disappearance of Doderlein flora with appearance of abundant substitution flora and presence of clues-cells. The potash test was carried out: we mixed a drop of leucorrhoea with a drop of 10% hydroxyd of potassium on a slide. A rotten fish-like amino odor indicates a positive reaction [18].

RESULTS

Distribution of participants according to socio-demographic characteristics

Cameroon is divided administratively into 10 regions; 45.3% of the women in our study came from the West region. The majority of the women were between 26 and 33 years old (38.67%) and only 6.6% of the women were of the Muslim religion. Women with a university level were the most represented (59.4%), 39.6% of women lived in a cohabitation and worked in the public service (32.5%).

Reasons that motivate to perform PIV

The prevalence of intravaginal practices was 54.7% among participants. The dominant type of IVP was scraping the vaginal walls with fingers (85.34%), followed by douching (6.03%) and the introduction of traditional herbs and other products into the vagina (4.31%) (Table 1). The majority of women who performed IVP gave hygienic reasons and to eliminate odors and vaginal secretions (91.37%), 8.62% of

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women mentioned as a reason the prevention of sexually transmitted infections after sexual intercourse and 3.44% cleaned their vaginal cavity after menstrual bleeding.

Table 1. Distribution of women according to the type of intravaginal practices

Types of IVP	N (%)
Scraping the vaginal walls with fingers (RPV)	99 (85.34)
vaginal Douche (VD)	7 (6.03)
Introduction of traditional herbs and other products into the vagina (IPV)	5 (4.31)
RPV and IPV	4 (3.45)
RPV and VD	1 (0.86)
Total	116 (100)

Distribution of intravaginal practices according to religion, age, professional status, marital status and level of education

Christian women performed more intravaginal practices (90.51%) than Muslim women (6.89%) but the difference was not significant. Women aged 26 to 33 were more adept at IVP (36.20%) followed by women aged 18 to 25; (34.48%) but the difference was not significant with the other groups of women. Women in liberal professions (shopkeepers,

seamstresses) performed more IVP (31.03%) than civil servants (28.44%). Cohabiting women were more adept at these practices (41.37%), followed by single women 31.89% and finally married women (25.86%). Regarding the level of education, university-level women were more represented concerning the IVP (52.58%) followed by secondary school women (39.65%) but the difference observed was not significant (Table 2)

Table 2. Distribution of PIV according to religion, age, profession, marital status, level of education

		Intravaginal practices		P-Value
Religion		Yes	No	0.540
	Christian	105 (90.51)	89 (92.7)	
	Muslim	08 (6.89)	06 (6.25)	
	Others	03 (2.58)	01 (1.04)	
	Total	116 (100)	96 (100)	
Age range (ans)				0.207
	18-25	40 (34.48)	22 (22.91)	
	26-33	42 (36.20)	40 (41.66)	
	34-41	22 (18.96)	26 (27.08)	
	42-49	12 (10.34)	08 (8.33)	
	Total	116 (100)	96 (100)	
Profession				0.174
	Civils servants	33 (28.44)	36 (37.5)	
	Liberal profession	36 (31.03)	18 (18.75)	
	students	26 (22.41)	26 (27.08)	
	housewives	21 (18.10)	16 (16.66)	
	Total	116 (100)	96 (100)	
Statut matrimonial				0.608
	Married	30 (25.86)	31 (32.29)	
	Concubinage	48 (41.37)	36 (37.5)	
	Single	37 (31.89)	29 (30.20)	
	Widow	01 (0.86)	0 (0.0)	
	Total	116 (100)	96 (100)	
	No instruction	00 (0)	01 (1.04)	0.084

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Niveau d'instruction	Primary	09 (7.75)	05 (5.20)
	Secondary	46 (39.65)	25 (26.04)
	University	61 (52.58)	65 (67.70)
	Total	116 (100)	96 (100)

Relationship between intravaginal practices and type of flora, infection with *Gardnerella vaginalis*, *Mobiluncus* and HIV infection

Women who performed IVP and had pathological flora (flora of bacterial vaginosis) represented (54.31%) against 43.75% of women who did not performed IVP and suffered from bacterial vaginosis, but the difference was not significant (P=0.777). 38.79% and 1.72% of women performing IVP suffered from *Gardnerella vaginalis* and *Mobiluncus* infections respectively against 37.5% and 4.16% of

Gardnerella vaginalis and *Mobiluncus* infections respectively in those who did not practice IVP; however, IVP was not statistically related to *Gardnerella vaginalis*, *Mobiluncus* and HIV infection (p=0.847, p=0.286, p=0.296 respectively). Civil servant and liberal professional women who performed IVP had a prevalence of 32.45% of bacterial vaginosis whereas the group of students and housewife had a prevalence of 8.06%. Many women who performed IVP were HIV-negative (98.27%) against 1.72% who performed IVP, (2/116) and were HIV-AIDS positive. (Table 3)

Table 3. Relationship between intravaginal practices and type of flora, *Gardnerella vaginalis*, *Mobiluncus*, and HIV infection

Type of flora	Intravaginal practices		P- value
	Yes (%)	No (%)	
Normal flora	63 (54.31)	54 (56.25)	0.777
Vaginosis flora	53 (45.68)	42 (43.75)	
Total	116 (100)	96 (100)	
<i>Gardnerella vaginalis</i> vaginosis			0.847
No	71 (61.2)	60 (62.5)	
Yes	45 (38.79)	36 (37.5)	
Total	116 (100)	96 (100)	
<i>Mobiluncus</i> vaginosis			0.286
No	114 (98.27)	92 (95.83)	
Yes	02 (1.72)	04 (4.16)	
Total	116 (100)	96 (100)	
VIH SIDA			0.296
No	114 (98.27%)	92 (95.83)	
Yes	02 (1.72)	04 (4.16)	
Total	116 (100)	96 (100)	

DISCUSSION

Prevalence and motivations of IVP:

The prevalence of IVP in our study population was 54.70%, this rate shows that intravaginal practices are common in our environment. Our prevalence is double of what Kechia et al. (2015) found in Yaoundé (26%) [12]. Esber et al. (2016) reported higher prevalence among women in Malawi (96%) [20] and McCarthy et al. (2015) in Ghana reported a prevalence of these IVPs of 100% [21]. A survey conducted by Hull et al (2011) in four countries in Asia showed that the prevalence of IVP varied from one region to another depending on cultures and motivations [22]. The majority of women (91.37%) in our study said that they performed IVP for hygiene, eliminating vaginal secretions and odors. Our results are similar to those of McCarthy et al. (2015) in Accra

where 83% of women mentioned the same motivations [21]. However, the motivation for IVP for the majority of women in Kwazulu Natal in South Africa was related to firming their vaginal walls [2] to improve the quality of intercourse.

Distribution of PIV according to age, professional status, marital status and level of education:

Women in the age groups of 18 to 25 years and 26 to 33 years accounted for more than 2/3 (70.68%) of women performing intravaginal practices. Our results corroborate those of Hull et al. (2011) who reported that IVP were more common among young urban women in Asia [22]. This could be justified by the fact that these are the most sexually active age groups.

Concerning socio-professional status, women in the liberal professions and women civil servants were more adept at

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these practices (31.03%) and (28.44%) respectively and suffered more from bacterial vaginosis; 32.45%. This result can be explained by the fact that they are stressed by their work. Stress is thought to be a risk factor for bacterial vaginosis, so these women can more suffer from bacterial vaginosis. Stress can alter immune function through multiple pathways and is associated with a greater prevalence and incidence of bacterial vaginosis [23]. Some authors have claimed that IVPs are often attempts to treat vaginal infections by these women [7]. In addition, the group of married women and women living in concubinage represented 67.23% of women who performed intravaginal practices. Our results are superior to those of Erbil et al. (2012) in Turkey who found a prevalence of IVP of 38.6% among women living with a partner [24]. Ours results can be justified by the fact that the sexual partner being present, the frequency of sexual intercourse was high, hence their need to cleanse their vaginal cavity after each sexual intercourse and avoid pregnancy. Moreover, frequent sexual intercourse prevents the restoration of the vaginal ecosystem after a coital act and promotes an ideal environment for the growth of anaerobes [25]. Finally, 92.23% of the women followers of the IVP in our study had at least the secondary level. Yet Hull et al. (2011) report that IVP are more common among less educated women in Africa [22], which Clark et al. (2007) confirm: black women and those with less than high school education were most likely to shower [16]

Link between IVP and the type of flora, *Gardnerella vaginalis* vaginosis, *Mobiluncus* vaginosis and HIV infection

In our study, 45.68% of women undergoing IVP had bacterial vaginosis flora. Alcaide et al. (2017) in Zambia report that 77% of women who perform IVP had bacterial vaginosis flora [26]. Intravaginal practices were not statistically related to the type of vaginal flora in our study ($p=0.77$). A similar result was found by Bradshaw et al. (2005) in their study who reported that no significant association was found between IVP and the type of flora ($P>0.05$) [27]. Regarding IVP and *Gardnerella vaginalis* and *Mobiluncus* infection, women who performed IVP and suffered from *Gardnerella vaginalis* and *Mobiluncus* vaginosis represented 40.51%, but the association between IVP and these two infections was not statistically significant ($p=0.847$ and $p=0.286$ respectively). Esber et al. (2016) found no association between bacterial vaginosis due to *Gardnerella vaginalis* and IVP in Malawi [20]. According to Mbizvo et al. (2004), women who performed IVP were more exposed to bacterial vaginosis caused by *Gardnerella vaginalis* [13]. On the other hand, Low et al. (2011) reported in their study that vaginal cleansing was statistically associated with bacterial vaginosis [14]. In our study, 98.27% of women who performed intravaginal practices declared a negative HIV status. We did not find a statistically significant association between IVP

and HIV status ($p=0.296$). However, some studies have shown that IVP could increase the risk of contracting HIV AIDS by disrupting the genital mucosa and weakening it [26]. According to McClelland et al. (2006) this practice may be an important factor promoting the spread of HIV [28].

CONCLUSION

Intravaginal practices are quite common among women in the central region of Yaoundé. Women aged 18 to 25, living in a couple and with at least secondary education were more adept at these practices. These IVPs were not related to bacterial vaginosis flora or HIV infection. Women should be educated about maintaining their vaginal cavity to avoid vaginal infections.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

ABBREVIATIONS

IVP: intravaginal practices

HIV: human immunodeficiency virus

RPV: scraping the vaginal walls with fingers

VD: vaginal douche

IPV: introduction of traditional herbs and others products into the vagina

BV: bacterial vaginosis

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