



Intravaginal Practices and Genital Infections: A Cross Sectional Study in the Yaoundé University Teaching Hospital

Ngonde-Essome MC^{1,2*}, Ngoutane A¹, Yimga G¹, Toukap M¹, Maboulou V¹, Mansour M¹, Matchawe C¹, Bonglaisin JN¹, Donfagsiteli N¹, Bondoro S³ and Gwet-Mbem PA⁴

¹Institute of Medical Research and Medicinal Plants Studies, Cameroon

²University Teaching Hospital Yaoundé, Cameroon

³Higher Institute of Health Professions, Cameroon

⁴Faculty of Medicine and Biomedical Science, Cameroon

Research Article

Volume 5 Issue 1

Received Date: April 13, 2023

Published Date: May 10, 2023

DOI: 10.23880/jcstm-16000116

***Corresponding author:** Ngonde Essome Marie Chantal, Institute of Medical Research and Medicinal Plants Studies, Yaoundé Cameroon, Email: ngondechan@yahoo.fr

Abstract

Cultural beliefs and educational factors strongly influence intravaginal practices of women in Sub Saharan Africa. These behaviors appear common in different population across Africa. Previous research has suggested that vaginal douching modifies vaginal flora and was associated with genital infections. The aim of this study was to evaluate the contribution of intravaginal practices in the acquisition of genital infections in women. For bacterial vaginosis diagnosis, vaginal smears were heat-fixed and Gram-stained then examined by light microscopy the results were interpreted by using a standardized method for diagnosing bacterial vaginosis, as described by Nugent. The mycological examination consisted of culturing on the CHROM agar *Candida* medium the vaginal swabs. The results were as follows: The majority of respondents were in the age group of 29-39 years (44%). The majority of participants were students with a prevalence of 42.60%. The results showed that 71% of women performed intravaginal practices and the most used vaginal practice was scraping the vaginal walls with the fingers (69.2%). Women with University level of education were statistically more adept at these practices (55.0%) than women with secondary level of education (30.8%) and primary level (14.2%) respectively, and the difference was significant ($P < 0.05$). The prevalence of vaginal candidiasis in female who did intravaginal practices was higher (64.7%) than in those who did not do intravaginal practices (35.3%). Same result was observed with bacterial vaginosis which was more common in women who did intravaginal practices (76.6%). However, no significant association was found between intravaginal practices and the occurrence of vaginal candidiasis and bacterial vaginosis in women ($P > 0.05$). Women who performed intravaginal practices were more co-infected with vaginal candidiasis and bacterial vaginosis (20.72%) than those who did not (10.34%); but the difference was not significant ($p > 0.05$). Intravaginal practices expose women to genital infections.

Keywords: Intravaginal Practices; Vaginal Candidiasis; Bacterial Vaginosis; Women; Genital Track

Introduction

Intravaginal practices are procedures used by women to cleanse and dry their vaginal cavity. These practices consist

of douching with water, commercial antiseptics, salty water, lemon water, scraping the vaginal walls with the fingers to eliminate excess vaginal secretion and the intromission of traditional herbs, pieces of cloth or paper into the vagina to

dry and make it firm in order to satisfy the sexual partner [1]. A study conducted in China by Liluo, et al. [2] reports that 84% of women practice douching. Another study conducted by Mclelland, et al. [3] in Kenya reports that 75% of intravaginal practices were done by scraping the vaginal walls with the fingers, while 23% of women reported douching with water while 71% used soapy water or antiseptics. Turner, et al. [4] in their study found that 84% of women reported cleansing inside the vagina and 40% of visited women reported drying the vagina using cloth or paper. A study made in Central Africa by Mbizvo, et al. [5] shows that 51% of women practiced intravaginal cleansing while 28% reported use of intravaginal herbs. There is a lack of studies concerning intravaginal practices in women in Cameroon. These vaginal practices aim to eliminate vaginal odor, excess vaginal secretions, to fight against sexually transmitted infections or pregnancy and to shrink and firm the vaginal cavity (UNESCO 2016) [6]. The vaginal cavity is protected from infections by lactobacilli which provide it with an acid pH that is unfavorable to the installation of numerous bacteria [7]. According to Turner, et al. [4] intravaginal practices increase the risk of vaginal infections (bacterial vaginosis) because they cause an ecological imbalance of the vaginal flora and sometimes a disappearance of lactobacilli. In a study conducted by Brown, et al. [8] in United States, 81% of women reported washing inside of their vagina, 21% of them suffered from bacterial vaginosis and 6% from vulvo vaginal candidiasis), intravaginal use of oils was associated with candida colonization, 44% compared to 5% in women who did not use it. Women reporting intravaginal use of petroleum jelly were 2.2 times more likely to test positive for bacterial vaginosis OR 2.2 IC (1.3-3.9) than women who did not use petroleum jelly [8]. Alcaide, et al. [9] reported in, their study that intravaginal practices increase the risk of developing bacterial vaginosis, the most common genital infection associated with transmission of Sexually transmitted disease and acquired immunodeficiency syndrom. Ekpenyong, et al. [10] in their study reported that frequent douching with water or other fluids was significantly associated with higher odds for recurrent vulvo vaginal candidiasis (OR 2.41 IC (1.25-4.66); p=0.000).

The aim of our study is to evaluate the contribution of intravaginal practices in the acquisition of genital infections in women who came for consultation in the department of gynecology of the University Teaching Hospital.

Material and Methods

Type and Duration of the Study

It was a cross-sectional study, spreading over a period of three months from June to August 2021, at the Yaoundé University Teaching Hospital in the Centre Region of Cameroon.

Study Population and Size of the Study

The study population consisted of 169 women aged 18 to 49 who came to the University Teaching Hospital for consultation in the department of gynaecology (pre natal consultation, prenuptial consultation, infertility) and who gave informed consent to participate in the study. Menopausal women and women menstruating or actively using vaginal ovules or antibiotics were excluded. The size of the population was calculated with the formula of Lorentz according the prevalence of 11% of vulvovaginal candidosis reported by Ekpenyong, et al. [10] in his study.

Sample Collection

Participants were asked to avoid vaginal cleansing before going for swabbing. Collected samples were processed in the Human Biology Laboratory of Institute of Medical Research and Medicinal Plants Studies.

After cleansing the vaginal margins with Dakin's solution, vaginal swabbing (at the cervix margins) was performed using specula and sterile swabs: a sterile cotton wool-tipped swab (Hensco Medical, Hanghan, Co, Ltd) was used to collect secretion from the vaginal walls and served to diagnose vaginal bacterial infections.

Each Sample Collected Was Preceded by a Questionnaire:

Participants were interviewed face to face by trained nurses. The information collected using the questionnaire included baseline information (age, marital status, education level), intravaginal practices, behavioral data (cleaning inside the vaginal cavity, vaginal toilet with finger, vaginal douching with water alone, water with soap, commercial antiseptic solution, vinegar, lemon juice, salty water, insertion of products to dry or tighten vagina as powder, cream, herbs, stones, leaves). The reason that motivated the participant to follow these practices (eliminate vaginal odor, eliminate excess vaginal secretion, fight against sexually transmitted diseases, avoid pregnancy, dry or tighten the vagina, by education, medical history past and current sexually transmitted infections such as gonorrhoea, *Chlamydia trachomatis* infection, acquired immunodeficiency syndrome (AIDS), mycoplasma infections, syphilis, history of self-medication and recent treatments).

Diagnosis of Bacterial Vaginosis

For bacterial vaginosis, vaginal smears were heat-fixed and Gram-stained then examined by light microscopy by a single reader and the results were interpreted by using a standardized method for diagnosing bacterial vaginosis, as described by Nugent, et al. [11]. Bacterial vaginosis was defined as a Nugent score of 7 to 10. Small Gram negative or variable bacilli were assumed to be *Gardnerella species*

morphotype and curved Gram variable to be *Mobiluncus*. Sniff test was performed with potassium hydroxide solution (10%). It is positive in case of bacterial vaginosis.

Mycological Examination and Identification

The mycological examination consisted of culturing on the CHROM agar *Candida* medium (Media Mage, Johannesburg, South Africa), the samples. This permitted to isolate and identify (depending on the color) *Candida* colonies after 24 to 48 hours of incubation. A number of colonies greater than or equal to 10 of a vaginal sample culture was considered to be a pathogenic character of the isolated yeast.

Ethical Considerations

Administrative authorization from the Director of Yaoundé University Teaching Hospital was obtained to carry out the research. The study was submitted to the National Research Ethics Committee for Human Health (CNERSH) to obtain their approval and an ethical clearance was issued under the reference N° 2021/01/615/CE/CNERSH/SP. Moreover, informed consent was obtained from patients who agreed to participate in the study.

Statistical Analysis of the Data

Data was entered in EXCEL software. The data collected was analysed statistically using SPSS software version 21.0. The chi square test was used to compare the difference in proportion between the variables. A p-value <0.05 was significant.

Results

The results were as follows:

The majority of respondents were in the age group of 29-39 years (44%) with an average age of 30.92±8.16 years. The majority of participants were students with a prevalence of 42.60% against 32.5% of civil servants, 12.4% of housewives and 12.5% of traders and farmers, single with a prevalence of 47.90%, with a higher level of education (62.20%). Results showed that 71% of women performed intravaginal practices and the most used vaginal practice is scraping the vaginal walls with the fingers (69.2%) followed by douching with simple water or other products (30.8%). Of the women who performed intravaginal practices, 60% (72 women) answered that they did it to eliminate vaginal secretions and 11.6% to dry out the vaginal cavity. 125/169 or 78% of the women had a vaginal infection.

The prevalence of vaginal candidiasis in the general population was 30.20% and that of bacterial vaginosis due to *Gardnerella species* was 43.20%. The 29-39 age group was more affected by vaginal candidiasis and bacterial vaginosis due to *Gardnerella vaginalis*; 51% and 43.8% respectively and the same was true for single people with regard to these two infections (52.9% for vaginal candidiasis and 49.3% for bacterial vaginosis due to *Gardnerella vaginalis*). University level women were more exposed to bacterial vaginosis (68.5%) than secondary (12.3%) and primary (19.1%) school women and the difference was statistically significant P=0.001 (Table 1).

Variables	Vaginal candidiasis		P value	Bacterial vaginosis		P value
	No	Yes		No	Yes	
Age (years)	N(%)	N(%)	0.9	N(%)	N(%)	0.3
18-28	32 (27.1)	16(31.4)		26 (27.1)	22 (30.2)	
29-39	49 (41.5)	26 (51.0)		43 (44.8)	32 (43.8)	
>40	37 (31.4)	09 (17.6)		27 (28.1)	19 (26)	
Total	118 (100)	51		96	73	
		(100)	(100)	(100)		
Marital status	N(%)	N(%)	0.2	N(%)	N(%)	0.9
Single	54 (45.8)	27 (52.9)		45 (46.8)	36 (49.3)	
Married	51 (43.2)	20 (39.2)		40 (41.7)	31 (42.5)	
Concubinage	13 (11)	4 (7.9)		11(11.4)	06 (8.21)	
Total	118	51		96	73	
	(100)	(100)	(100)	(100)		
Educational						

level	N(%)	N(%)	0.001	N(%)	N(%)	0.001
Primary	12(10.1)	07(13.7)		21(21.8)	14(19.1)	
Secondary	17(14.4)	29(56.8)		36(37.5)	09(12.3)	
University	89 (75.4)	15(29.4)		39 (40.6)	50(68.5)	
Total	118	51		96	73	
	(100)	(100)	(100)	(100)		

Table 1: Distribution of vaginal infections according to age, marital status and level of education.

The prevalence of bacterial vaginosis flora (score 7-10) according to the Nugent classification was 40.20%. The prevalence of co-infection; vaginal candidiasis and bacterial vaginosis due to *Gardnerella species* was 23.2%.

The distribution of intravaginal practices according to socio-demographic characteristics showed that, the age group of 29-39 performed more intravaginal practices

(42.5%), followed by 18-28 years (39.2%). Married women practiced more intravaginal practices (47.5%) than single women; but the difference was not significant ($P>0.05$). University-level women were statistically more adept at these practices (55.0%) than women with secondary education (30.8%) and primary-level women (14.2%) and the difference was significant ($P=0.01$) (Table 2).

Intravaginal practices			P value
Variables	No	Yes	0.13
Age group (years)	N(%)	N(%)	
18-28	26 (53.1)	47 (39.2)	
29-39	19 (38.8)	51 (42.5)	
>40	04 (8.1)	22 (18.3)	
Total	49 (100)	120 (100)	
Marital status	N(%)	N (%)	0.08
Single	29 (59.1)	52 (43.3)	
Married	14 (28.7)	57 (47.5)	
Concubinage	06 (12.2)	11 (9.2)	
Total	49 (100)	120 (100)	
Educational level	N(%)	N(%)	0.01
Primary	02 (4.1)	17 (14.2)	
Secondary	08 (16.3)	37 (30.8)	
University	39 (79.6)	66 (55)	
Total	49 (100)	120 (100)	

Table 2: Distribution of intravaginal practices according to socio-demographic characteristics.

The prevalence of vaginal candidiasis in female who performed intravaginal practices was higher (64.7%) than in those who did not do intravaginal practices (35.3%). However, no significant association was found between intravaginal practices and the occurrence of vaginal candidiasis in women ($P=0.23$). Regarding bacterial vaginosis, it was more common in women who did intravaginal practices (76.6%) than in women who did not (23.3%). No significant association was found between intravaginal practices and

the occurrence of bacterial vaginosis ($P= 0.15$). Finally, no significant association was found between intravaginal practices and the type of flora ($P=0.13$), but the pathological flora Nugent score (7-10) was found with a greater frequency (53.3%) in women who did intravaginal practices. Women who performed intravaginal practices were more coinfected with vaginal candidiasis and bacterial vaginosis (20.72%) than women who did not (10.34%) but the difference was not significant ($P= 0.19$) (Table 3).

Intravaginal practices			P value
Vaginal candidiasis	No N (%)	Yes N (%)	0.23
No	31 (26.3)	18 (35.3)	
Yes	87 (73.7)	33 (64.7)	
Total	118 (100)	51 (100)	
Bacterial vaginosis	N(%)	N(%)	0.15
No	32 (33.3)	17 (23.3)	
Yes	64 (66.7)	56 (76.7)	
Total	96 (100)	73 (100)	
Type of flora	N(%)	N(%)	0.13
Score (0-6)	29 (59.2)	56 (46.7)	
Score (7-10) (Flora of bacterial vaginosis)	20 (40.8)	64 (53.3)	
Total	49 (100)	120 (100)	
Coinfection	N(%)	N(%)	0.19
No	52 (89.65)	88 (79.27)	
Yes	06 (10.34)	23 (20.72)	
Total	58 (100)	111(100)	

Table 3: Link between intravaginal practices and genital infections, type of flora, coinfection.

Discussion

Intravaginal practices are a reality in our context. Cultural beliefs and educational factors strongly influence intravaginal practices by women in Africa [12]. These behaviors appear common in different population across Sub Saharan Africa where practices include the use of water, antiseptic preparation, traditional medicine or the insertion of fingers into vagina [13]. The main reasons that motivate these women to follow these practices are to eliminate vaginal odor, to remove excess vaginal secretion, to clean before and after sex, to fight against sexually transmitted infections and tighten the vagina to please their partners [12,14-17]. Previous research has suggested that vaginal douching modifies vaginal flora and was associated with bacterial vaginosis, chlamydial infections [14]. In past studies, the rate of genital infections was 53.5% and 33.8% in women who did and did not douche, respectively [18].

Socio-Demographic Characteristics of the Study Population

The majority of the women in our study were aged 29-39; 44.4%. This can be justified by the fact that one gynecological consultation out of two is done by young women of childbearing age [19].

The majority of women surveyed had a university level (62.02%), which suggests that they should have correct knowledge of the risks incurred by performing intravaginal practices. The majority of them were single with a prevalence of 47.9%. Dieye, et al. [20] in their study conducted in Senegal had enrolled a majority of married women. This result of our study can be justified by the fact that the majority of our participants are students (42%) and the Yaoundé University teaching hospital being surrounded by many higher education institutions.

Distribution of Women According to Intravaginal Practices

This study reports that 71% of women performed intravaginal practices; 120/169. The intravaginal practices most used by women were scraping the vaginal walls with the fingers (69.2%). According to a study conducted by Liluo, et al. [2], in China among prostitutes, 84% made intravaginal practices. Their higher prevalence than ours can be justified by their employment as sex workers; following their encounter with many sexual partners, they try to keep their vaginal cavity clean [2]. On the other hand, Clark, et al. [21] reported that 64% of women practiced douching in their study. Our higher prevalence can be justified by the fact that the black race is more adept at douching than

Caucasian women. This is corroborated by Hassam, et al. [22] in his study: African women perform more intravaginal practices (33%) compared to women of European origin (14%) and Latinos (8%). The distribution of intravaginal practices according to socio-demographic characteristics showed that, the age group of 29-39 years performed more intravaginal practices, which can be justified by the fact that it is a very sexually active age group [23], wanting to keep their vaginal cavity clean after multiple sexual intercourse. Married women practiced the most intravaginal practices (47.5%) which can be justified by the regular washing of their vaginal cavity because of the regular sexual relations maintained with their husband. University-level women were statistically more adept at these practices (55.0%), than women with secondary (30.8%) and primary (14.2%) level of education; $P=0.01$.

However, Gresenguet G, et al. [24] reports that women with a low socio-economic level and a low intellectual level are more adept at these practices due to their low level of knowledge. Clark, et al. [21] in their study confirms that women with less than high school education were most likely to shower.

Distribution of Vaginal Candidiasis and Bacterial Vaginosis at *Gardnerella Vaginalis* in the General Population

125/169 or 78% of women had a vaginal infection. The prevalence of vaginal candidiasis in the general population was 30.20% and that of bacterial vaginosis due to *Gardnerella vaginalis* was 43.20%. The rate of vaginal candidiasis (51%) and bacterial vaginosis (43.8%) was higher in women aged 29-39 and unmarried (52.9%) for vaginal candidiasis and 49.3% for bacterial vaginosis. This can be justified that at this age, sexual activity is maximum and the number of sexual partners in single people is sometimes high and the high frequency of sexual intercourse damages the flora of Doderlein, the protective flora of the vaginal cavity. A study conducted by Ngoc-Anh D, et al. [25] in Vietnam support our findings; they reported the same prevalence of vaginal candidiasis as ours (51.3%). A study conducted by Mulu, et al. [26] in Ethiopia reported a prevalence of bacterial vaginosis of 15.2%. Our high prevalence of bacterial vaginosis (43.20%) can be justified by the fact that our study population is a follower of intravaginal practices (71%), moreover in our study 55% of university level women (students often single) were followers of these practices often linked to bacterial vaginosis. Our results show that women with university education were statistically ($P=0.001$) more exposed to bacterial vaginosis (68.5%) than women with secondary (30.8%) and primary (14.2%) level of education. This can be justified in our study by the fact that university-level

women were more adept at intravaginal practices (55%); while Mbizvo, et al. [5] reported that an education level of less than 13 years was associated with bacterial vaginosis.

Relationship between Intravaginal Practices and Vaginal Candidiasis, Bacterial Vaginosis, Co-Infection, Type of Flora.

The prevalence of vaginal candidiasis (64.7%) and bacterial vaginosis (76.6%) in women who did intravaginal practices were higher than in women who did not perform these practices (35.3%) and (23.3%) respectively. However, no significant association was found between intravaginal practices and the occurrence of vaginal candidiasis and bacterial vaginosis in women ($P=0.23$, $P=0.15$). Our results were (high prevalence of bacterial vaginosis in women who performed intravaginal practices) confirmed by a study conducted by Hassam, et al. [22], He reported that bacterial vaginosis was associated with intravaginal petroleum used because the alkaline pH of petroleum could promote the growth of bacteria of bacterial vaginosis [23]. Brown, et al. [8] reported that among women who did intravaginal practices, 21% had bacterial vaginosis and vulvovaginal candidiasis. Our study found the same prevalence of co-infections (20.72%) and moreover women who performed intravaginal practices were more coinfecting (20.72%) with vaginal candidiasis and bacterial vaginosis than women who did not (10.34%); this high prevalence of coinfection in our study can be justified by the fact that African women are more adept of these practices. Gaddhar, et al. [27] found that 57.7% of pregnant women were co-infected with vaginal candidiasis and bacterial vaginosis. Their higher prevalence compared to ours (20.72%) can be explained by the fact that pregnant women are often immunocompromised and are more prone to infections, particularly vaginal candidiasis. Finally, no significant association was found between intravaginal practices and the type of flora ($P=0.13$), but the pathological flora; Nugent score (7-10) was found with a greater frequency (53.3%) in women who did intravaginal practices. This result corroborate that of Alcaide, et al. [9] who report that intravaginal practices increase the risk of developing bacterial vaginosis; (Nugent flora score 7-10), the most common genital infection associated with the transmission of sexually transmitted infections and acquired immunodeficiency syndrom.

Conclusion

Intravaginal practices expose women to genital infections. The rate of women who follow intravaginal practices is high and women with university education in our study are users of these practices which are discouraged by health professionals since they are harmful to genital health. Women must be educated about the hygiene of their vaginal

cavity in order to avoid genital infections.

References

- Girod V (2013) Les femmes et le sexe dans la Rome antique. Tallandier, Paris, France, pp : 384.
- Luo L, Xu JJ, Wang GX, Ding GW, Wang N, et al. (2016) Vaginal douching and association with STI among female sex workers in a prefecture of Yunnan province China. *Int j STD AIDS* 27(7): 560-567.
- Mclelland S, Lavreys L, Hassan WM, Mandaliya K, Ndinya-Achola JO, et al. (2006) Vaginal washing an increased risk of HIV-1 acquisition among African women: a 10 yaer prospective study. *Aids* 20(2): 269-273.
- Turner AN, Morrison CS, Munjoma MW, Moyo P, Tsungai C, et al (2010) Vaginal Practices of HIV negatives zimbabwean women. *Infect Dis Obstet Gynecol* 2010: 387671.
- Mbizvo ME, Musya SE, Stray-Pedersen B, Chirenje Z, Hussain A (2004) Bacterial vaginosis and intravaginal practices : association with HIV. *Cent Afr J Med* 50(5-6): 41-46.
- Unesco, Santé sexuelle et droits humains (2017) pratiques à risques et santé sexuelle chez les femmes migrantes d'Afrique.
- Bohbot JM (2016) L'écosystème vaginal, ses variations physiologiques et pathologiques. *Réalités Gynecol Obstet* 57: 31-33.
- Brown JM, Kristen HL, Brown S, Murphy C, Waldman AL, et al. (2013) Intravaginal practices and Risk of bacterial Vaginosis and Candidiasis infection among a cohort of women in United States. *Obstet Gynecol* 121(4): 773-780.
- Alcaide ML, Chisembele M, Malupande E, Rodriguez VJ, Fischl MA, et al. (2017) A bio-behavioral intervention to decrease intravaginal practices and bacterial vaginosis among HIV infected Zambian women, a randomized pilot study. *BMC infect Dis* 17(1): 338.
- Ekpenyong CE, Inyang-etoh EC, Etebong EO, Akpan UP, Ibu JO, et al. (2012) Recurrent vulvovaginal candidosis among young women in South Eastern Nigeria: the role of lifestyle and health care practices. *Int j Std Aids* 23(10): 704-709.
- Nugent RP, Krohn MA, Hillier SL (1991) Reliability of diagnosis bacterial vaginosis is improved by a standardized method of gram stain interpretation. *J Clin Microbiol* 29(2): 297-301.
- Annang L, Grimley DM, Hooek EW (2006) Vaginal douche practices among black women at risk: exploring douching prevalence reasons for douching and sexually transmitted diseases infections. *Sex Transm Dis* 33(4): 215-219.
- Myer L, Kuhn L, Stein ZA, Wright TC Jr, Denny L (2005) Intravaginal practices, bacterial vaginosis and women's susceptibility to HIV infection: epidemiological evidence and biological mechanism. *Lancet infect Dis* 5(12): 786-794.
- Yildirim R, Vural G, Koçoglu E (2020) Effect of vaginal douching on vaginal flora and genital infection. *J Turk Ger Gynecol Assoc* 21(1): 29-34.
- Funkhouser E, Hayes TD, Vermund SH (2002) Vaginal practices among women attending a university in the Southern United States. *J Am Coll Health* 50(4): 177-182.
- Crosby RA, Yarber WL, Meyerson B (2000) Prevention strategies other than males condoms employed by low income women to prevent HIV infection. *Public Health Nurs* 17(1): 53-60.
- Ness RB, Hillier S, Ritcher HE, Soper DE, Stamm C, et al. (2003) Can know risk factors explain racial difference in the occurrence of bacterial vaginosis? *J Natl Med Assoc* 95(3): 201-212.
- Ege E, Timur S, Zincir H, Egri M, Reeder BS (2007) Women's douching and related attitudes in Eastern Turkey. *J Obstet Gynecol Res* 33(3): 353-359.
- Direction de la recherches des études de l'évaluation et des statistiques (2002) qui sont les patients des consultations externes hospitalières. *Etudes et Résultats* avril. numéro 167
- Dieye C (2002) Evaluation de la pratique sexuelle au Sénégal.
- Clark RA, Theall KP, Amedee AM, Kissinger PJ (2007) Frequent Douchng and clinical outcomes among Hiv-infected women. *Sexually transmitted Diseases* 34(12): 985-990.
- Hassam WM, Lavreys L, Chohan V, Richardson BA, Mandaliya K, et al. (2007) Association between intravaginal practices and bacterial vaginosis in Kenya female sex workers without symptoms of vaginal infection. *Sex Trans Dis* 34(6): 384-388.
- Vallor AC, Antonia AMA, Hawes SE, Hillier SL (2001) Factors associated with acquisition of an persistant colonization by vaginal lactobacilli; role of hydrogen peroxide production. *J Infect Dis* 184(11): 1431-1436.

24. Gresenguet G, Chapko MK, Hillier SL, Weiss NS (1997) HIV infection and vaginal douching in Central Africa. *Aid* 11(1): 101-106.
25. Anh DN, Nguyen H, Tran-Viet T, Vu-Nhat D, Vu-Tung S, et al. (2021) Antifungal susceptibility of candida albican causing vaginal discharge among symptomatic non pregnant women of reproductive age at a tertiary care hospital, Vietnam. *BMC Infect Dis* 21(1): 523.
26. Mulu W, Yimer M, Zenebe Y, Abera B (2015) Common causes of vaginal infection and antibiotic susceptibility of aerobic bacterial isolates in women of reproductive age attending at felegehiwot referral hospital Ethiopia: a cross sectional study. *BMC womens Health* 15: 42.
27. Ghaddar N, El Roz A, Ghssein G, Ibrahim JN (2019) Emergence of vulvovaginal candidiasis among lebanese pregnant women: prevalence, risk factors and species distribution. *Infect Dis Obstet Gynecol* 2019: 5016810.

