

## Assessing The Prevalence of Gardnerella Vaginalis-Trichomonas Vaginalis Co-Infection Among Women of Reproductive Age Attending the Catholic's Hospital Mgr Jean Zoa of Nkolndongo, Yaounde, Cameroon

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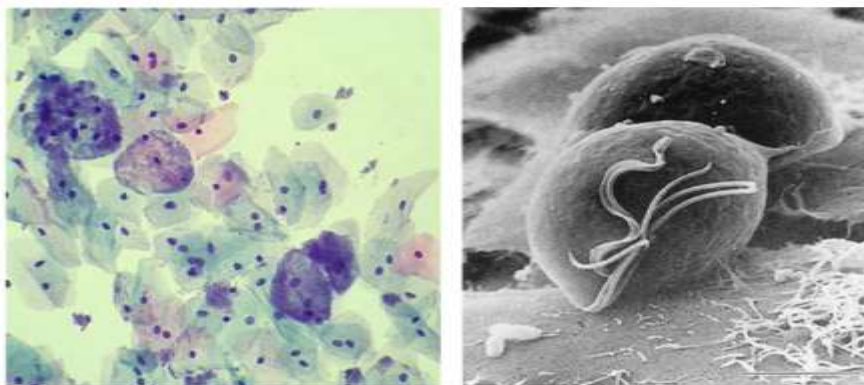
**Abstract:** Gardnerella vaginalis as well as Trichomonas vaginalis are among the most common vectors of vaginal discharges and urogenital infections. The objective of this work was to evaluate the prevalence of Gardnerella vaginalis-Trichomonas vaginalis Co-infection, Gardnerella vaginalis and Trichomonas vaginalis versus the contributions of some sociodomeestic factors among women of reproductive age attending the Catholic's Hospital Mgr Jean Zoa of Nkolndongo, Yaounde. A descriptive and transversal investigations were conducted from 11<sup>th</sup> to 31<sup>st</sup> August 2016 on a total number of 60 women by collecting their vaginal strains for microscopical analysis. A well structured questionnaires were done aimed at collecting patients sociodomeestic information for EPI INFO analysis. It was revealed that 2% were infected by the Gardnerella vaginalis-Trichomonas vaginalis co-infection, the prevalence of Gardnerella vaginalis and Trichomonas vaginalis were 13.3% and 5% respectively. Moreover, the patients within the age range of 26~30 had the highest prevalence. Furthermore, the patients using well water for their toilet had the highest prevalence of each pathogens, although this was not statistically significant.

**Keywords:** Gardnerella vaginalis, Trichomonas vaginalis, Gardnerella vaginalis-Trichomonas vaginalis Co-infection, prevalence, sociodomeestic.

### I. Introduction

Bacteria vaginosis (BV) have been diagnosticated as the most common cause of unpleasant vaginal odor and discharge among reproductive age women [1 and 2]. Its pathogenesis results in the reduction of hydrogen peroxide and organic acids levels usually present in the vagina as the consequence of imbalance natural microflora. Any change in the resident flora including reduction of lactobacillus allows the different anaerobic bacteria to gain a foothold and multiply [3-7]. Although BV has been a subject of numerous researches, but the initial mechanism of replacement of normal lactobacillary flora by opportunistic pathogens in vaginal ecosystem and the role of intrinsic host factors still need to be investigate [5-8]. The major candidates in pathological polymicrobial associations, which could be used as markers for BV are Gardnerella vaginalis and anaerobic Atopobium vaginae [3-8]. Other microorganism responsible of women Cervico-vaginal infections are diversified and include Anaerobes. According to the investigation carried out by [9] the proportion of women infected by Gardnerella vaginalis stands for 55.31%, Candida spp (30,77%), Staphylococcus aureus (5,49%), Enterobacteriaceae (4,40%), Trichomonas vaginalis (3,66) and Mobilincus spp (0,37%). BV have been reported to be more common in promiscuous women with hazardous sexual behavior [10-16]. Women contaminated with BV are at increased risk of post-abortion pelvic inflammatory diseases, infections such as surgery or other routine gynecologic procedures, sexually transmitted infections including HIV, and serious pregnancy complications such as intrauterine infection and preterm birth [17-27].

Gardnerella vaginalis as shown in fig. 1 was the first bacterium implicated in the pathogenesis of BV and continues to be associated with the disease [28]. [28] described Gardnerella vaginalis as the main vector of clinical features of a grey, homogenous, odorous vaginal discharge with a pH higher than normal (5.0-5.5) and minimal vaginal inflammation. The Trichomonas vaginalis as indicated in fig. 2 is a sexually transmitted parasite causing vulvovaginitis characterized by intense frothy yellow-greenish vaginal discharges, irritation and pain in the vulva, perineum and thighs, and dyspareunia and dysuria [29]. In sub-saharan African countries, specially in Cameroon, literature concerning the prevalence of these pathogens are not well documented. Therefore, this current work focuses on evaluation of the prevalence of Gardnerella vaginalis-Trichomonas vaginalis co-infections among women of reproductive age attending the Catholic's Hospital Mgr Jean Zoa of Nkolndongo versus the contribution of some sociodomeestic factors.



**Fig. 1:** Microphotography of Gardnerella Vaginalis [30] **Fig. 2:** Trichomonas vaginalis on the surface of a vaginal epithelial[31]

## II. Methodology

### Patient Selection

This study was carried out at the Catholic's Hospital Mgr Jean Zoa of Nkolndongo, Yaounde, Cameroon from 11<sup>th</sup> to 31<sup>st</sup> August 2016. All the female patients aged between 15~40 years were received by the gynecologists the hospital center, Yaounde. Postmenopausal women as well as pregnant women under antimicrobial therapy were not included in this selection. Thus, altogether 60 High Vaginal Swabs (HVS) were obtained from women with evident clinical symptoms of vaginal discharge. HVS samples were collected by inserting a sterile speculum into the posterior and anterior fornix of the vagina while the patient is in lithotomy position, the state of the cervix and Leukorrhoea were appreciated. Samples proprieties such as the odor, the color, the consistency, the quantity of Leukorrhoea were observed. Prior the samples collections, all the patients were not on their menstrual period or were at least 3 days after the last menses, had not douched, had not sexual relation the morning of the test and were asked confidential questions.

### Clinical Identification Of Micro-Organisms

Trichomonas vaginalis was identified by putting the collected vaginal swabs on a clean slide prior wet with two (2) drops of physiological water, the mixture was covered with a clean slip well defatted. The assembly was immediately examined for viable organism (leukocytes and yeast) under x10 and x40 objectives of the light microscope.

Whiff test and Gram staining were the different methods used to identify Gardnerella vaginalis. Whiff test was used to produce a strong fishy ammoniacal odor from the mixture whilst Gram staining was to differentiate the major groups of BV on the basis of cell wall composition. They were divided and labelled into 2 groups: Gram positive bacteria (Bg+) which has thick layer of peptidoglycan had a purple color whilst Gram negative bacteria (Bg-) with a thin layer of peptidoglycan had a pink color once viewed under x10 and x40 objectives of the light microscope prior added a series of specific drops of gentian violet solution, lugol's solution, alcohol, carbol fuchsin and oil immersion on the slide containing the HVS. Moreover, four (4) different types of vaginal flora typing were also identified and labelled: Type I for slides having only Gram positive bacilli which indicates normal vaginal flora. Type II for slides having Gram positive bacilli and few other bacteria; Type III for slides having few Gram positive bacilli and many other Bacteria which indicates bacterial vaginosis and Type IV for slides having no Gram positive which indicates BV.

### Statistical Analysis Of Data

Data was keyed in Excel 2007 and exported to EPI INFO version 7.1 (Estimation Program Interface Information) for statistical analysis. Categorical variables were presented using frequencies and percentages. The difference in proportion were examined using the chi-square test and we considered  $P < 0.05$  to indicate statistical significant.

### Ethical And Administrative Clearance

The current investigation was carried out in accordance to the World Health Organization standard procedure and met the international ethical standards. Prior conducted this research, an ethical approval was procured from the School of Health Sciences of the Catholic University of Central Africa while the Director of Catholic's Hospital Mgr Jean Zoa of Nkolndongo, Yaounde issued the administrative clearance. Eligible women who fitted the inclusion criteria were free to take part in this investigation after been properly educated about the advantages and risks of the research. All participants consent were sought and obtained prior HVS collection.

III. Results and discussion

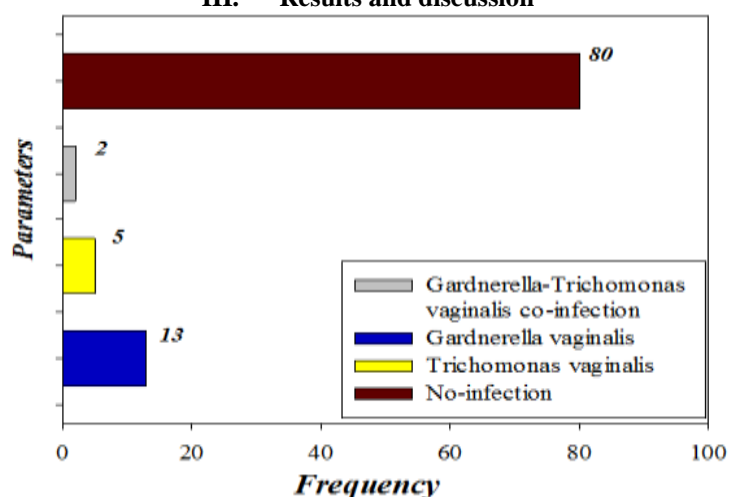


Fig. 3 Prevalence of vaginal infection

During this research a total number of sixty (60) female patients aged between 15~40 years with an average age of 28 years were examined. It was observed that 80% of the women were not infected by the BV, the prevalence of Gardnerella vaginalis and Trichomonas vaginalis were 13% and 5% respectively whilst the Gardnerella vaginalis-Trichomonas vaginalis co-infection had the lowest percentage with a value of 2% as shown in fig. 3 and the most representative age range was between 26~30 years (see Table 1). The results of Gardnerella vaginalis and Trichomonas vaginalis prevalence are close to 10.5% and 1.5% respectively as reported by [30] among women in Ibadan, Nigeria. This could be attributed to the fact that patients introduced the fingers into their vaginal part.

Table 1: Prevalence of vaginal infections in relation with age range

Age range	GV No(%)	TV No(%)	GV/TV Co-infec No(%)	Absent	Total No(%)
15 - 20	2(25)	0(0)	0(0)	8(16.7)	10(16.7)
21 - 25	1(12.5)	0(0)	0(0)	12(25)	13(21.7)
26 - 30	1(12.5)	1(33.3)	0(0)	17(35.4)	19(31.7)
31 - 35	2(25)	1(33.3)	0(0)	4(8.3)	7(11.7)
36 - 40	2(25)	1(33.3)	1(100)	7(14.5)	11(18.3)
Total	8(13.3)	3(5)	1(1.7)	48(80)	60(100)

Among the (sixty) 60 patients, 20%(13.3%+5%+1.7%) were infected by one of the pathogens as shown in Table 1. The prevalence of Gardnerella vaginalis was 13.3% of the total number of patients and 66.7% of those who were infected. This observation could be ascribed to the fact that the patients were not well educated concerning the appropriate bathing methods. Moreover, the prevalence of Trichomonas vaginalis was 5% of the total number of patients (see table 1) and 25% of those who were infected (see table 2). This could be due to the fact that the patients were mostly used infected well water for their toilet. Furthermore, the kind of water used by the women and the prevalence of pathogens were not statistically significant in a light of chi-square expected (27.35) and the one observed (16.92) with  $P < 0.05$ . This could be due to the fact that the water used by the patients in urban zone was well treated.

Table 2: Prevalence of vaginal infections in relation with the kind of water used

Parameters	GV No(%)	TV No(%)	GV/TV Co-infec No(%)	Total No(%)
Well	5(62.5)	2(66.7)	1(100)	8(66.7)
Tape	2(25)	1(33.3)	0(0)	3(25)
Pump	1(12.5)	0(0)	0(0)	1(8.3)
Mountain	0(0)	0(0)	0(0)	0(0)
Total	8(66.7)	3(25)	1(8.3)	12(100)

The prevalence of Gardnerella vaginalis-Trichomonas vaginalis co-infection was 2%. This low prevalence was partially attributed to the fact that the minimum hygiene rules were respected by some of the patients, specially pregnant women who were effectively well educated during prenatal clinics as indicated in Table 3 and also majority of the patients probably had a high academic level. Hence, the basic hygienic rules were well known.

**Table 3:** Prevalence of vaginal infections in relation with the gestational status

Parameters	GV No(%)	TV No(%)	GV/TV Co-infec No(%)	Total No(%)
Pregnant	5(62.5)	0(0)	1(100)	6(50)
Nope pregnant	3(37.5)	3(100)	0(0)	6(50)
<b>Total</b>	<b>8(66.7)</b>	<b>3(25)</b>	<b>1(8.3)</b>	<b>12(100)</b>

In this investigation, the prevalence of single women was the most significant ( N=6, 50%), followed by married women ( N=5, 41.7%) and lastly by divorce women (N=3, 8.3%) as indicated in Table 4. This trend corroborated with the findings of [31]. They reported that the prevalence of single women was highest (47.2%) in comparison with the married women (40.9%) and divorce women (7.3%) among women in Thika, Kenya. With Regards to our results, marital status and prevalence of each infection was not statistically significant in the light of chi-square expected value (13.48) and the one observed (12.59) with  $P < 0.05$ . The prevalence of single women was roughly 10% higher than that of married women. This was probably due to hazardous sexual behavior of single women. The prevalence of BV and vulvovaginal was 25% of the infected patients which was higher than 20.9% reported by [32]. However, the gestational status and the prevalence of the infection was statistically significant base on the chi-square expected (5.94) and the one observed (7.81) with  $P < 0.05$ . This could be attributed to hormonal change during the test.

**Table 4:** Prevalence of vaginal infections in relation with the marital status

Parameters	GV No(%)	TV No(%)	GV/TV Co-infec No(%)	Total No(%)
Married	3(37.5)	1(33.3)	1(100)	5(41.7)
Single	4(50)	2(66.6)	0(0)	6(50.0)
Divorce	1(12.5)	0(0)	0(0)	3(8.3)
<b>Total</b>	<b>8(66.7)</b>	<b>3(25)</b>	<b>1(8.3)</b>	<b>12(100)</b>

Concerning women intimate hygiene, a high prevalence was observed with those using antiseptic products for their toilets (58.3%) as indicated in Table 5 as well as those introducing the fingers into their vagina as shown in Table. 6 (66.7%). The hygiene and the prevalence were statistically related base on the chi-square expected (6.14) and the one observed (7,81) with  $P < 0.05$ . This certainly due to the fact that the antiseptics products used by the patients were mostly basic with varied pH leading to favorably destroy the vaginal flora and the formation of a new non-protective flora. Hence, the BV were diagnosed. This conclusion corroborated with the findings of [34] who reported that most of vulvovaginal infections were caused by the use of antiseptic products.

**Table 5:** Prevalence of vaginal infections in relation with the use of antiseptic products

Parameters	GV No(%)	TV No(%)	GV/TV Co-infec No(%)	Total No(%)
Yes	6(75)	1(33.3)	0(0)	7(58.3)
No	2(25)	2(66.7)	1(100)	5(41.7)
<b>Total</b>	<b>8(66.7)</b>	<b>3(25)</b>	<b>1(8.3)</b>	<b>12(100)</b>

**Table 6:** Prevalence of vaginal infections in relation with the bathing methods

Parameters	GV No(%)	TV No(%)	GV/TV Co-infec No(%)	Total No(%)
Normal	1(12.5)	3(75)	0(0)	4(43.3)
Fingers into the vagina	7(87.50)	1(25)	0(0)	8(66.7)
<b>Total</b>	<b>8(66.7)</b>	<b>3(25)</b>	<b>0(0.0)</b>	<b>12(100)</b>

#### IV. Conclusion

This research aimed at investigating the frequencies of the GV-TVco-infections among women of reproductive age attending the Catholic's Hospital Mgr Jean Zoa of Nkolndongo in Yaounde. It was

observed that among the 60 patients, 2% were jointly infected by GV-TV, the prevalence of GV and TV were 13% and 5% respectively. Furthermore, according the chi-square test, the pregnancy and the prevalence were statistically significant.

## V. Recommendation

Out of this work, a socioeconomic and sexual promiscuity variable should be considered for future investigations at a large scale of patients.

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