Occurrence of *Gardnerella vaginalis* in Women in Jos, Nigeria

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ABSTRACT: *Gardnerella vaginalis* is the principal causative agent of bacteria vaginosis in women globally; it is one of the commonest complaints of women attending gynaecological clinics and lead to serious complications such as PID, premature labour, and post partum sepsis. We have therefore investigated the occurrence rate and some socioeconomic factors of *Gardnerella vaginalis,* in Jos, Nigeria. Two hundred high vaginal swabs were collected from females 15-45 years of age and examined microscopically by gram stain and wet mount preparation for the demonstration of clue cells. Samples were also tested for pH, and fishy odour. An overall prevalence rate of 23(11.5%) was recorded in all samples tested comprising 14(14.7%) of patients presenting with vaginal discharge, 6(9.2%) in patients presenting with PID and 3(7.5%) healthy controls as seen in Table 1. Age range distribution showed that age range 15- 25 had the highest rate with 15(18.0%) in subjects tested, followed by 7(9.3%]) in age 26-35 and lastly 1(2.5%). The result of *G. vaginalis* positivity according to socio-economic status revealed that, with respect to educational and marital status, a prevalence rate of 12.6% positivity was recorded for married women and 9.2% for singles. A prevalence of 14.1% was recorded for the uneducated women and 6.2% for the educated women. From the findings of this study, we conclude that routine testing for *G. vaginalis* bacteria vaginosis be recommended for gyneacological clinic attendees as well as antennal patients we also advocate for better enlightenment programs against this infection amongst women.
[Aboderin BW, Motayo BO, Idiong DU, Okerentugba PO, Innocent-Adiele HC, Onoh CC, Nwanze JC, Okonko IO. N Y Sci J. 2012;5(5):37-40]. (ISSN: 1554-0200). http://www.sciencepub.net/newyork. 7

Key words: *Gardnerella vaginalis,* Bacteria Vaginosis, clue cells, Prevalence rate.

1. INTRODUCTION

Bacteria vaginosis is a clinical condition characterized by a change in vaginal ecology and accompanied by vaginal discharge itching and unpleasant odour, the mixed morphotypes of *Lactobacillus* spp is replaced by a mixed microbial flora composed of mainly anaerobes and *Gardrenella vaginalis* (Alli et al., 2011). Infection with this bacterium is characterized by vaginal discharge with an unpleasant odor, and an absence of leucocytes (pus cells) in wet prep mounts of examined samples (Holmes et al., 1983). The offensive odour given off by infection with *G. vaginalis* has been attributed to the breakdown of proteinous epithelial cells that are sloughed into the vagina. Segmented neutrophils are not a predominant component of the secretion, suggestive that the organism does not invade the sub-epithelia tissue, thus resulting in the term vaginosis rather than vaginitis (Hendrich et al., 1995).The change in the vaginal ecology usually brings about a reduction in the number of H_2O_2 producing bacteria, thus increasing the rate of colonization of other organisms such as, *Mobiluncus spp*, *Aptobium vaganae*, *Peptococcous spp*, *Mycoplasma hominis* and *Gardnerella vaginalis* , resulting in bacteria vaginosis (Romannik et al., 2007). Vaginitis which is also another common gyneacological condition in sexually active females can be differentiated diagnostically by the presence of a significant number of pus cell observable by microscopy of the vaginal discharge. However about 50% of women with microbiologic findings suggestive of bacteria vaginosis are asymptomatic and spontaneous resolution of laboratory confirmed cases have been known to occur in majority of these individuals (Bump et al., 1984).

Bacteria vaginosis which formerly known as non-specific vaginitis has previously been reported to occur in about 50% of healthy women (McCormack et al., 1970), with *G. vaginalis* having a colony count of about 10^7 cfu per milliliter of vaginal fluid, this is indicative of a possible commensal role played by this bacteria in apparently healthy women, possibly a combination of several factors might be responsible for the pathogenicity exhibited by this organism is symptomatic women (McCormack et al 1970). Bacteria vaginosis caused by *G. vaginalis*, is associated with infections such as urinary tract

infections and infectious complications in pregnant and non-pregnant women as well as increasing the risk of contracting other sexually transmitted infections (Romannik et al., 2007).

Laboratory diagnosis of *G. vaginalis* can be done based on demonstrating 3 of the following 4 criteria originally described by Gardner and Dukes (1955): 1) Thin but profuse vaginal discharge with pH 4.5. 2) A fishy odour, especially with the addition of 10% KOH (Wiff test), 3) Demonstration of Clue cells (squamous cells of the vagina with myrads of small rods adherent to their surface) and 4) Microscopy under a stained smear with papanicolaour stain. The bacteria can also be isolated on solid media such as Enriched blood agar (HBA) or Human blood-Tween (HBT) agar (Alli et al., 2011). Value of vaginal pH is significantly elevated in bacteria vaginosis, although pH has also been reported to be elevated in patients who had sexual intercourse 2 days before the examination of sample (Fujimotos et al., 1995).

In Nigeria there have been several reports on *G. vaginalis* infection incriminated in bacteria vaginosis. In a study done recently at the University of Ibadan a prevalence rate of 25.0% among STI Clinic attendees was reported (Alli et al., 2011). The objective of our study is to determine the prevalence of *G. vaginalis* in adult females in Jos, and the socio-economic factors associated with G. *vaginalis* Bacteria vaginosis.

2. MATERIALS AND METHODS

2.1. Sample population and collection

Two hundred high vaginal swabs (HVS) specimen were collected from 160 women presenting with different Gyneacological conditions comprising 95 with vaginal discharge, 65 with pelvic inflammatory disease (PID) and 40 healthy controls at the Jos University Teaching Hospital. Samples were collected using a sterile swab with the aid of a speculum and sent to the laboratory immediately for processing. Sample preparation and Processing: Swabs were processed for wet mounts using physiological saline and 10% KOH, and examined for clue cells according to standard Microbiological protocol (Cheesbrough, 2006). A combination of Gram stain and pH determination of the vaginal discharge was also used in addition to diect wet microscopy. The presence of squamous epithelial cells covered by numerous coccobacili was indicative of *G. vaginalis* bacteria positivity in wet mounts, in addition to a fishy odour and pH value greater than 4.5.

3. RESULTS ANALYSIS

An overall prevalence rate of 23(11.5%) was recorded in all samples tested comprising 14(14.7%) of patients presenting with vaginal discharge, 6(9.2%) in patients presenting with PID and 3(7.5%) healthy controls as seen in Table 1. Age range distribution showed that age range 15- 25 had the highest rate with 15(18.0%) in subjects tested, followed by 7(9.3%]) in age 26-35 and lastly 1(2.5%), as shown in Table 1.

Table 1: Occurrence rate of *Gardnerella vaginalis* according to Diagnosis and Age range

Characteristics	No. tested	No. Positive (%)
Daignosis		
Vaginal discharge	95	14(14.7)
PID	65	6(9.2)
Control subjects	40	3(7.5)
Age-range (Years)		
15-25	85	15(18.0)
26-35	75	7(9.3)
36-45	40	1(2.5)
Total	**200**	**23(11.5)**

The result of *G. vaginalis* positivity according to socio-economic status revealed that, with respect to educational and marital status, a prevalence rate of 12.6% positivity was recorded for married women and 9.2% for singles. A prevalence of 14.1% was recorded for the uneducated women and 6.2% for the educated women (Table 2).

Table 2: Occurrence rate of *Gardnerella vaginalis* according to educational and marital status

Characteristics	No. tested	No. Positive (%)
Marital status		
Married	135	17(12.6)
Singles	65	6 (9.2)
Educational status		
Educated	65	4(6.2)
Uneducated	135	19(14.1)
Total	**200**	**23(11.5)**

4. DISCUSSION

Gardnerella vaginalis is the most implicated organism in Bacteria vaginosis which is a major gynaecological condition in sexually active women globally (Gibbs et al., 1995). We have investigated the occurrence rate of this organism in adult women and associated risk factors in Jos, Nigeria. A prevalence rate of 11.5% was recorded for all women tested; this is similar to an earlier report of Abgakoba et al. (2008) that reported a prevalence of 11.9% in asymptomatic antenatal attendees. Result of age range distribution of positive cases revealed that age range 15-25 had the highest infection rate of 15(18.0%), this is in agreement

with earlier reports such as that of Olawuyi (2011) who reported a high prevalence of *Gardnerella vaginalis* in women in their most active reproductive age. We also observed that there was no significant difference between subjects who presented with PID as differential diagnosis and controls (p-value 0.05). This can be attributed to the fact that epidemiological studies have shown that about 50% of sexually active women are infected at least once with this organism and only a fraction of them are symptomatic(Aurelian et al., 1973).

With regards to socio-economic status, we observed that a positivity rate of 6.2% was recorded for women with high economic status, as compared to 14.1% recorded for women with poor economic status, this is in agreement with an earlier report by Gibbs et al. (1995) which reported that Bacteria vaginosis is mostly associated with people of low income and probably have been delivered as low weight infants. It is however regretted that we were not able to isolate *Gardnerella vaginalis* from our samples; this is because of our limitation in culturing the samples in the appropriate enriched culture media. This would have enabled us to demonstrate the antibiotic susceptibility pattern displayed by potential isolates in order to advocate for the most suitable antibiotic regimen for our environment. However, it is suggested that further research studies are required in this regard. There was a decrease in *Lactobacillus spp* in gram stained slides of subjects screened for Bacteria vaginosis in our study setting, which is concurrent to an earlier work by Morgan (Morgan et al., 1996) that reported that possibility of isolation of *Lactobacillus spp* decreases from grade 1 (normal flora) to grade 3 (Bacterial vaginosis) in clinical staging.

5. CONCLUSION

The findings from our study, highlight the prevalence of *Gardnerella vaginalis* in adult women presenting with gynaecological complaints in Jos metropolis, *G. vaginalis* is observed to be most prevalent in women with vaginal discharge and symptoms consistent with Bacteria vaginosis in Jos it is also observed that asymptomatic relatively healthy women are also at risk of acquiring this infection particularly those of low income and poor socio-economic background. It is however advocated that, investigation of B. vaginosis be done routinely for all gynaecological cases as well as ante-natal patients. General public enlightenment programs on proper hygiene should be done for women of reproductive age to aid in early detection and treatment of this important infection of women.

AKNOWLEDGEMENTS

We sincerely thank the management and staff of the Obstetrics and Gyneacology, University of Jos Teaching Hospital, Jos, Nigeria. We also appreciate all those who participated in this study.

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4/5/2012