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Research Article

Bacterial Vaginosis

Determining the role of intra-uterine contraceptive device, oral contraceptive pills and multiple sexual partners in altered vaginal flora leading to bacterial vaginosis, in patients attending a tertiary care hospital in central Maharashtra, India

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Background and Objective: Risk Factors of Bacterial Vaginosis (BV) includes multiple sex partners, sex without a condom, douching (washing the inside of vagina with a stream of water),poor hygiene, use of sexual toys or aids without proper cleaning, using an intrauterine device (IUD) for contraception. The precise contribution of sexual transmission to the overall epidemiology of the condition remains controversial. This study was undertaken with a objective to find out the role and association of risk factors like Intra-uterine contraceptive device (IUCD), Oral contraceptive pills(OCP's), Multiple Sexual Partners in alteration of normal vaginal flora leading to BV. **Material and Methods:** High Vaginal Swabs of two hundred and fifty women of reproductive age (15 – 45 years) group who attended Gynaecology and Obstetrics OPD/IPD at tertiary care hospitals formed the study population. Detail patient history was noted. Nugent score elicited. **Results:** Bacterial Vaginosis was more in women using IUCD i.e. 77% (17) cases as compared to women using OCP i.e. 21 % (3) cases and to women not using OCP/IUCD i.e. 12% (8) cases. Bacterial vaginosis was more in women with abnormal sexual behaviour, with multiple partners i.e. prevalence was 50% (4/8 cases) as compared to women with normal sexual behaviour, with one male partner i.e. prevalence was 31.2 % (75/240cases) and in virgins prevalence of BV was 0 %(0/2cases). **Conclusion:** Bacterial vaginosis is associated with sexual activity like multiple sexual partner, douching, intrauterine-device and oral contraceptives.

Keywords: Bacterial vaginosis, Intra-Uterine Contraceptive Device, Multiple Sexual Partners, Oral Contraceptive Pills

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Introduction

Bacterial Vaginosis (BV) is a clinical syndrome associated with the presence of a group of microorganisms rather than a single etiologic agent [1]. Though most of the times asymptomatic but when BV affected women is symptomatic they complain predominantly of offensive, vaginal odour. The odour, often described as fish-like, may be more obvious after sexual intercourse. The foul smell can be more prominent after intercourse without a condom. Sperm or semen has a neutral pH of around 7. When semen is introduced into a vagina that has BV, the anaerobic bacteria release more amines to produce the fishy odor. The same holds true for blood, which leans toward a neutral or slightly alkaline pH, which is why the fishy odor may also increase around or during menstruation. About 90 percent of patients also notice a mild to moderate discharge. Dysuria, dyspareunia and vulval itching are rare because this infection is not linked to an inflammatory response of the surrounding tissue.

Risk Factors of BV includes multiple sex partners, sex without a condom, douching (washing the inside of vagina with a stream of water), poor hygiene, use of sexual toys or aids without proper cleaning, using an intrauterine device (IUD) for contraception [2,3].

Mode of spread of BV: The precise contribution of sexual transmission to the overall epidemiology of the condition remains controversial. Support for the idea that sexual transmission plays a significant role is based on the following evidence: increased prevalence of BV among women with a recent new partner, Gardnerella vaginalis recovered from the urethras of more than 89 percent of the male sexual partners of infected women and increased prevalence among women in STD clinics. However, several observations argue against exclusive heterosexual transmission since the infection can be demonstrated in virgins and homosexual populations. The organisms associated with BV can be cultured from the rectum and might then go from there on to colonize the vagina. Thus while BV is ssociated with certain sexual behaviours, it is not considered a sexually transmitted infection. BV is not a sexually transmitted disease between male and female partners. Studies have shown there is no benefit to treating her male partner [3]. There Have been recent studies done, however, that show BV to be sexually transmitted between female partners [3]. Examples of sexual activities that can increase risk of developing BV are multiple partners and frequent sex without a condom. The use of sex toys without proper cleaning can increase chances of acquiring BV [3]. Not all cases of BV are related to sexual behaviour and even women who have never had sex can have BV. Oral contraceptives are protective against BV [4] while intrauterine devices have been reported to either increase [5] or have no association [6] with BV risk.

Data regarding the association between sexual activity and BV acquisition are contradictory. Receptive oral sex has been shown to alter the vaginal micro flora [7], and increased frequency of sex, unprotected sex, and recent partner changes have also been reported to increase the risk of BV [8]. Condoms appear to decrease the risk ofdeveloping BV [6]. BV, however, has been reported in virgins [8] and one meta-analysis did not find vidence that partner treatment significantly affected recurrence rates [9], findings suggestive that an exclusive sexual mode of transmission is unlikely**.** This Study was undertaken with an objective to find out the role and association of risk factors like Intra-uterine contraceptive device (IUCD), Oral contraceptive pills (OCP's), Multiple Sexual Partners in alteration of normal vaginal flora leading to BV.

Material and Methods

The present observational and prospective study was conducted in the Microbiology department at a Tertiary care Hospital, situated in central Maharashtra, India. The protocol was reviewed and approved by institutional review board, and each subject gave verbal consent. Age, pregnancy status, parity, ethnicity, mode of contraception, number of sexual partners, presence or absence of symptoms, and a sexually transmitted diseases history were noted.

Those who had received systemic antibiotic therapy or local vaginal antimicrobial therapy within the preceding 2 weeks, were menstruating at the time of the examination, cervical cerclage, vaginal bleeding, placenta previa, spermicide use, recent douching, or sexual intercourse within 24 hours were excluded from the study. High Vaginal Swabs of two hundred and fifty women of reproductive

Age (15 – 45 years) group who attended Gynaecology and Obstetrics OPD/IPD at tertiary care hospitals formed the study population. Amsel's Clinical criteria and Nugent's microbiological criteria for diagnosis of BV were used [10].

Statistical Analysis: Data in our study were statistically evaluated & compared and probability values (P) were calculated by using Chi square (÷2) test, Fisher's exact test. Probability values of <0.05 were considered significant with 95% level of significance (i.e. confidence interval of 95. Also the data was compared by using Ms Excel software.

Results

Table 1: Coexistence observed between bacterial vaginosis and in IUCD / OCP'S using women

Non-Pregnant women -100	GROUP- I No %	GROUP - II No %	GROUP – III No %
Number of women studied-	64 --	14 --	22 --
Normal	39 (61)	3 (21)	2 (9)
Bacterial Vaginosis	8 (12)	3 (21)	17 (77)
Vaginal Candidiasis	14 (22)	8 (58)	3 (14)
Trichomonas Vaginitis	3 (5)	0	0

GROUP I: Women not taking any Hormonal Oral Contraceptives / IUCD

GROUP II: Women taking Hormonal Oral Contraceptives

GROUP III: Women using IUCD

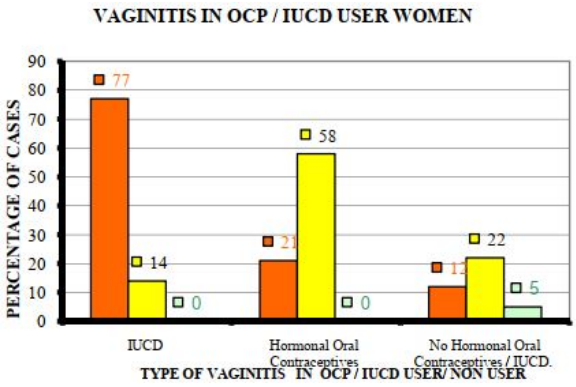

Figure1:-Coexistence observed between bacterial vaginosis and in IUCD / OCP's USING WOMEN

Fisher's exact test: Revealed that diagnosis of bacterial vaginosis between the above group I and group II. P=0.433, i.e. nonsignificant.

Chi square test: Revealed that diagnosis of Bacterial vaginosis between the above group II and groupIII. ÷2 =13.488, P=0.00, i.e. highly significant. Thus statistically it is inferred that diagnosis of bacterial vaginosis is more common in IUCD users.

Table 2:- Coexistence observed between bacterial vaginosis and sexual exposure.

Total Cases-250	GROUP- I No %	GROUP - II No %	GROUP – III No %
Number Of Cases	2 ---	240 ---	8 ---
Normal Vaginal Flora	0 0	116 48.4	0 0
Bacterial Vaginosis	0 0	75 31.2	4 50
Vaginal Candidasis	2 100	48 20	2 25
Trichomonas Vaginitis	0 0	1 0.4	2 25

GROUP I: Virgin Women.

GROUP II: Women with normal sexual behaviour with Single Male partner.

GROUP III: Women with abnormal sexual behaviour like multiple partner/Lesbians / History of douching / Use of sexual toys inside vagina etc.

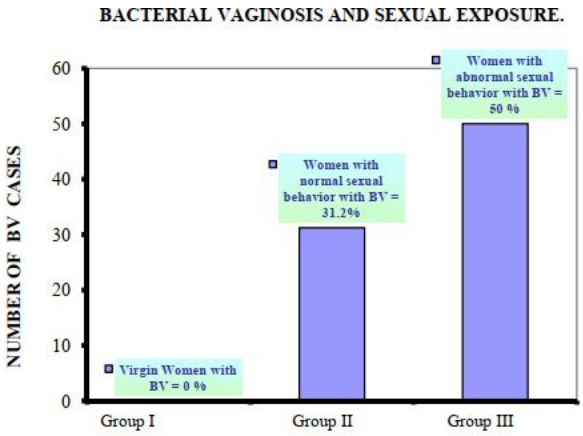

Figure 2:- Coexistence observed between bacterial vaginosis and sexual exposure.

Discussion

In our study as shown in Table 1, Bacterial Vaginosis is more in women using IUCD i.e. 77% (17) cases as compared to women using OCP i.e. 21 % (3) cases and to women not using OCP/IUCD i.e. 12% (8) cases. Similarly Candidiasis is more in women using OCP i.e. 58% (8) cases as compared to women using IUCD i.e. 14 % (3) cases and to women not using OCP/IUCD i.e. 22% (14) cases. Thus incidence of bacterial vaginosis is increased with use of IUCD, while incidence

Of candidiasis is more with use of OCP. In a study by Sophia Yen et al [1]**,** in contrast, there was an inverse relationship between a bacterial vaginosis diagnosis and report of hormonal contraceptive use. Furthermore, the finding of an association between hormonal contraception and bacterial vaginosis, which suggests a possible protective factor against bacterial vaginosis, has been described by Holzman C et al, Calzolari E et al, Hay PE et al , Shoubnikova M et al as well [4, 6,11, 12,] .

In our study as shown in Table 2, Bacterial vaginosis was more in women with abnormal sexual behaviour, with multiple partners i.e. prevalence was 50% (4/8 cases) as compared to women with normal sexual behaviour, with one male partner i.e. prevalence was 31.2 % (75/240cases) and in virgins prevalence of BV was 0 % (0 /2cases). Sexual experience was defined for the purposes of this study as having had vaginal intercourse at least once. F R Jones et al [13] reported that in women who claimed to be virgins, there were 15.5% cases of BV of total cases, 3.6% cases trichomoniasis of total cases. Warren D et al [14] reported woman to woman sexual contact in prior 6 months results in 3-fold increased risk. Robert E. Gutman et al[15] in their study found that women with bacterial vaginosis were also more likely to have a history of Neisseria gonorrhoeae infection and trichomoniasis, but a history of at least one sexually transmitted disease was not significantly increased in the women with bacterial vaginosis. A study by Larsson et al [16] revealed similar risk factors for sexually transmitted diseases and bacterial vaginosis, including lower age of first intercourse and higher number of lifetime sexual partners. Yen et al [1] in their study displayed a lower rate of bacterial vaginosis among the "non–sexually experienced" and a higher rate among those with multiple sexual partners in the past 3 months. However, in Robert E. Gutman's study and in Yen's, a history of a sexually transmitted disease was not associated with an increased prevalence of bacterial vaginosis.

In Edward Demba et al's study, BV or vaginal flora patterns were not associated with any of the factors relating to sexual hygiene practices (vaginal douching, menstrual hygiene, female genital cutting) [17]. Lifestyle practices such as vaginal douching have also been associated with an increased prevalence of BV [4]. But contrary to this in their study Edward Demba et al[17],did not find any association between BV or vaginal Microorganisms and vaginal hygiene practices such as douching before or after sex, the nature of douching compounds used, the source of the water, or with menstrual sanitary protection.

In a study by Sophia Yen et al [1], among those sexually experienced, having multiple sexual partners in the past 3 months and C trachomatis infection were found to be associated with bacterial vaginosis. Finally, regarding clinical correlates of bacterial vaginosis, Draper DL et al findings of an increased prevalence of bacterial vaginosis among those women with C trachomatis infection is supported by other research [18], which suggest that bacterial vaginosis might facilitate STD infection by decreasing local secretory leukocyte protease inhibitor levels. Bacterial vaginosis was not significantly associated with prior STD history, barrier contraception use, nor with current T vaginalis or N gonorrhoeae infections. Ethnicity, sexual experience, self-reported vaginal odor, having multiple sexual partners in the past 3 months, C trachomatis infection, and report of hormonal contraceptive use were all significant correlates of bacterial vaginosis diagnosis. Perhaps the difference in prevalence by ethnicity could be explained by differences in douching practices (which has been associated with bacterial vaginosis [4] or foreign body use (eg, tampons [4], sex toys, etc) that might affect the vaginal ecosystem, as well as biologic factors, which might vary by ethnicity.

A cross-sectional study of Amy L Evans et al [19] recruiting lesbian women and heterosexual women, reported that of lesbians and heterosexuals recruited, BV was identified in 25.7% lesbians and 14.4% heterosexuals. Concordance of vaginal flora within lesbian partnerships was significantly greater than expected (87% couples). Smoking ignificantly increased the risk of BV regardless of sexuality and showed substantial concordance in lesbian partnerships but less than for concordance of flora. Women who identified as lesbians had a 2.5-fold increased likelihood of BV compared with heterosexual women. Higher concordance of vaginal flora within lesbian partnerships may support the hypothesis of a sexually transmissible factor or reflect common risk factors such as smoking.

Epidemiologic studies have found that early sexual activity, a high number of lifetime sexual partners, women with a new sexual partner, and women with a prior sexually transmitted

Disease are also at increased risk of BV [20]. BV is more prevalent among women with a prior or current sexually transmitted disease. However, the occurrence of BV may be the direct consequence of exposure to the infectious pathogen, not the sexual behavior. In fact, many pathogens have been shown to change vaginal flora by reducing the concentration of Lactobacillus and promoting anaerobic bacteria proliferation and subsequent BV development [20]. Although sexually transmitted diseases and BV commonly coexist, particularly trichomoniasis and BV, BV is not considered a sexually transmitted disease [21]. For example, a study conducted by Bump RC et al among school-age girls found similar rates of BV among virgin girls and nonvirgin girls (12 percent and 15 percent, respectively [8]. Furthermore, although the anaerobic organisms in excess in cases of BV have been cultured from the male sexual partners of women with BV, treatment of male sexual partners is not a reliable way to reduce the recurrence of BV in these women. However, a small study conducted by Berger BJ of monogamous lesbian women concluded that the likelihood of one partner having BV was 20 times greater if the other partner was BV positive, supporting the early finding by Gardner and Dukes that BV is transmissible through direct inoculation of vaginal secretions [22].

Some behaviour, such as vaginal douching, has been examined as potential risk factors for BV. Among nonpregnant woman, self-reported vaginal douching has been reported to increase the risk of BV [23]. Holzman et al found more than a twofold increased risk of BV among nonpregnant women who self-reported vaginal douching in the prior 2 months [4]. No known studies have been published to date examining the role of douching and BV development among pregnant women. Vaginal douching may change the vaginal flora, reduce the amount of Lactobacillus, and create an environment promoting excessive anaerobic growth; on the other hand, the act of douching may be a consequence of the symptoms of BV (i.e., vaginal discharge and odor) or a current sexually transmitted disease [23].

F R Jones et al [24] study showed a high prevalence of BV in urban women from lower socioeconomic neighbourhoods in Peru. Their results suggest that age, marital status, a history of sex work, or current trichomoniasis or bacterial STD are associated with BV. Since BV may be a marker for STDs, STD screening should be performed in individuals with BV to facilitate early detection and treatment of co-infecting sexually transmitted pathogens.

Summary and Conclusion

BV is not considered a sexually transmitted disease though it is not only sexually transmitted but is seen more frequently in women who visit Sexually Transmitted Diseases (STD) clinics. Bacterial vaginosis a clinical syndrome characterized by malodorous vaginal discharge is associated with sexual activity like multiple sexual partner, douching, intrauterine-device and oral contraceptives.

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