

Contraceptive Use and Sanitary Napkin's Types in Relation to Bacterial Vaginosis among Reproductive Age Females with Vaginal Discharge

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ABSTRACT

Background: Bacterial vaginosis (BV) has been proposed as the most common vaginal disease among women of childbearing age as an adjunct to the development of cervical cancer. Previous studies of the relationship between BV and contraceptive use with sanitary practices as determinants have provided inconsistent and conflicting results.

Aim: To determine the frequency of Bacterial vaginosis & find its association with contraceptive use and sanitary practices along marital status.

Study Design: Cross sectional analytical study

Place and duration of study: Department of Gynaecology, Sh. Zayed Hospital Lahore from 01-01-2016 to 31-10-2016.

Methodology: Two hundred and ninety six women of reproductive age group with complaint of vaginal discharge attending were enrolled. Proper history regarding age, marital status, use of contraceptive methods and sanitary practices was taken.

Results: Disease prevalence was found to be 18.9%. Bacterial vaginosis was associated with age, type of sanitary napkins, and method of contraception, with adjusted odds ratios of 47.45, 279.9 and 172.0. However no association was found between the disease and marital status (as independent risk factor).

Conclusion: Not using contraception and type of sanitary napkins are strongly related to occurrence of bacterial vaginosis in women of reproductive age group with vaginal discharge.

Key words: Bacterial vaginosis, Pap smear, Contraceptive methods, Sanitary napkin use

INTRODUCTION

During last five decades a lot of medical research is being conducted but still cause and course of bacterial vaginosis, a perplexing disorder, are unknown. Major issue faced by the developing world includes Infections of cervix and vagina. *Gardnerella vaginalis* and *Trichomonas vaginalis* cause 90% of vaginal infections. *Trichomonas vaginalis* is sexually transmitted and makes an anaerobic environment that is fertile to cause bacterial vaginosis and presents mostly in the form of vaginal discharge¹.

Vaginal discharge in reproductive age females are commonly caused by the bacterial vaginosis.¹⁻⁵ Poly microbiological agents are its major cause⁴ and is described by abnormalities of vaginal secretions and disturbance in vaginal ecology. *Gardnerella vaginalis*, *Mycoplasma hominis*, *Mobiluncus*, *Prevotella* and *Ureaplasma urealyticum* the common microorganisms involved⁶.

Among child bearing age female population, worldwide prevalence ranges between 11 and 48% with variation according to population studies.⁷ Nearly 50% of them, having bacterial vaginosis, are symptom free.⁸ White milky discharge, fishy odor and mild itching are the most common symptoms.^{5,9}

Many risk factors for bacterial vaginosis including social, behavioral, cultural, ethnic, biological and sexual factors are identified.¹⁰ These include sexual activity at young age, multiple sexual partners,⁴ homosexuality^{2,4} use of intra-uterine devices, douching,³ hygienic practices and nutritional status.^{4,5} Although sexual activity is one of the risk factors for bacterial vaginosis, this may happen in women who never had sexual activity^{3,5}.

Bacterial vaginosis is very common in homosexual women, establishing sexual transmission as an imperative factor.¹¹⁻¹⁵ Furthermore, other sexually transmitted conditions have all the earmarks of being related to an expanded commonness of BV.¹⁶ It is thought that estrogen-containing contraceptives pills and condom could provide effective defense against BV¹⁷.

Increased growth of bacterial vaginosis associated microorganisms increases the risk of chronic pelvic inflammatory disease, HIV and CIN.^{8,18} Acute and chronic cervicitis are also common in females with bacterial vaginosis.¹⁴ Bacterial vaginosis is also a danger for *Gonorrhoea*, *Chlamydia* and HIV infection^{19,20}.

Pap smear being an effective cytological tool to diagnose many treatable diseases including BV, cervical intraepithelial neoplasm (CIN) and many pre-malignant conditions must be made available for every woman with history of vaginal discharge in outdoor settings²¹⁻²⁴.

Many studies are being conducted, worldwide, to determine the frequency of BV but the causes are rarely addressed. Two studies conducted in Pakistan in 2006⁶ and 2008¹² also addressed only the frequency of BV in the two cities with results of 55% prevalence in Karachi and 16-30% in Rawalpindi, indicating a huge gap.

Bacterial vaginosis was defined by overgrowth of one of several types of bacteria normally present in vagina most commonly *Gardnerella* and is characterized by vaginal discharge. For cervical smear cytology, a specimen of the cellular material from the neck (cervix) of uterus was taken through Pap smear; and pathology was examined through a compact standard procedure; details given elsewhere.²⁵

Keeping in views a study in Lahore was conducted to see the frequency of BV and its relation with different factors. This study particularly addresses the sanitary napkins and contraceptive use.

MATERIALS AND METHODS

It was a cross sectional analytical study conducted on Pap smear of women of reproductive age (15–49) group with vaginal discharge who attended Gynae OPD at Shaikh Zayed Hospital Lahore. Cervical smears were taken from 296 women presenting with vaginal discharge by the Gynecologist. The study was approved by institutional ethics committee. After taking informed consent from the patients included in the study population, information about presence of bacterial vaginosis, age, marital status, history of contraceptive use, methods used and type of sanitary napkins used were gathered. All data were collected through a standard Performa.

Data were entered and analyzed by using SPSS-20. Association of factors with bacterial vaginosis was described by using Odds ratios with 95% confidence interval, adjusted odds ratios with 95% confidence interval were used to see the association of factors simultaneously through Binary Logistic Regression Analysis. Odds ratio by not including "1.00" in the 95% confidence interval was considered significant. Chi square test was

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used to see the relation between contraceptive methods used and Bacterial vaginosis. P-value ≤ 0.05 was considered significant.

RESULTS

The average age measured was 32.4 ± 6.5 years for the selected women was, and 92(31.1%) of them were of age above 35 years, 260(87.8%) were married, 125(42.2%) did not use any contraceptive methods and 68(23%) used cloth as sanitary napkin. Through pap smear cytology, 56(18.9%) were diagnosed to have bacterial vaginosis.

Table 1: Bacterial vaginosis in relation to age, marital status, contraceptive use and type of sanitary napkins; expressed in odds ratios and adjusted odds ratios (through binary logistic regression model) with 95% confidence interval

Variable		Bacterial Vaginosis				Odds Ratio	Adjusted Odds ratio (Binary logistic regression)
		Yes		No			
		No.	%	No.	%		
Age	>35	30	32.6	62	67.4	3.31(1.82–6.03)	47.45(5.8–389.5)
	≤ 35	26	12.7	178	87.3	Ref	Ref
Marital Status	Married	50	19.2	210	80.8	1.19(0.47–3.02)	28.2(3.96 – 201.1)
	Single	6	16.7	30	83.3	Ref	Ref
Use of Contraception	No	50	40.0	75	60.0	18.33(7.53–44.63)	279.9(24.0–3264.4)
	Yes	6	3.5	165	96.5	Ref	Ref
Type of sanitary napkins	Cloth	50	73.5	18	26.5	102.8(38.8–272.1)	172.0(37.1 – 797.2)
	Branded	6	2.6	222	97.4	Ref	Ref

Odds ratios in bold are significant at 5% level of significance

The condom were used by 119 (40.2%), IUD by 31 (10.5%), OCP's by 18 (6.1%) and BTL by 3 (1.0%) as a measure of contraceptive, while 89 (30.1%) preferred not to use any method and 36(12.2%) had no requirement as were unmarried and sexually inactive.

There were 3(2.5%) among condom users, all 3(100.0%) of BTL with bacterial vaginosis while none in IUD and OCP's, were found to have BV. Among sexually active none users of contraceptive, there were 44 (49.4%) with BV while among inactive non users, 6 (16.7%) were diagnosed with BV (Fig.1)

Fig. 1: Bacterial vaginosis in relation to contraceptive method used

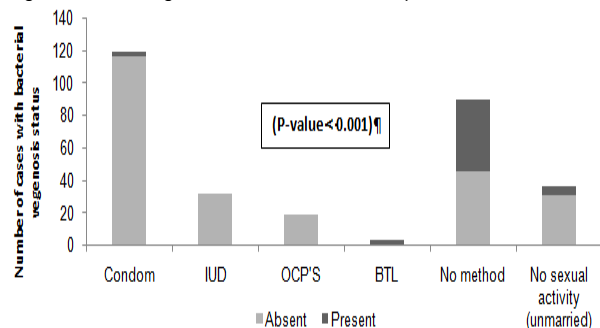


Table 2: Predictability of binary logistic regression model with age, marital status, contraceptive use and sanitary napkins used as indicators of bacterial vaginosis

Classification Table				
Step 1	Observed	Predicted		%age correct
		Bacterial vaginosis		
		Yes	No	
Bacterial vaginosis	Yes	47	9	83.9
	No	3	237	98.8
Overall percentage				95.9

Nagelkerke R-square = 0.827

When risk factors were compared, 32.6% of the women with age above 35 had vaginosis with an odds ratio of 3.31 (1.82–6.03) and adjusted odds ratio of 47.45 (5.8–389.5). Married women had insignificant odds ratio of 1.19 when marital status was considered independent risk factor but through logistic regression its adjusted odds ratio 28.2 (3.96–201.1) was significant. Not using contraceptive measure was considered to be a very big risk factor with adjusted odds ratio of 279.9 (24.0–3264.4) and sanitary napkins of cloth the second most important predictor of BV with adjusted odds ratio of 172.0 (37.1–797.2) [Table 1].

The binary logistic regression model with age, marital status, contraceptive use and sanitary napkin type was overall predicting bacterial vaginosis with 95.9% accuracy. For predicting BV it was

accurate in 83.9% and for predicting its absence it was accurate up to 98.8% (Table 2).

DISCUSSION

The first variables studied here was age. Here the bacterial vaginosis was associated with age > 35 (32%) and 12.7% in age ≤ 35 years in this study which is consistent with the results of the studies conducted by Ranjit el al²⁶ on 160 non pregnant women, Nzomo et al²⁷ in Kenya on 193 women of child bearing age (18-49 years) with vaginal discharge and Gad et al²⁸ where highest prevalence of BV was seen among 30–40 years' age group (8.8%) and least BV cases were seen in patients with age group of 10–20(1.3%) in the first study²⁹, 27.5% prevalence was seen between 31-40 years and least among those below 20 years (15%) in the second study 60.16% prevalence among 30-40years and least (33.3%) among those below 20 years of age³⁰ and 54.5% (18/33) in age group 26-35 years, 27.3% in age group 36-45 years and least 18.2% in age group 18-25 years relating the occurrence of disease with increasing age respectively.²⁸ As our study included only reproductive age women with cut off age of 49 years, therefore the results of other studies reporting low incidence after the age of 50 years could not be observed.

Marital status was not found to be related to the occurrence of BV as independent factor with nearly equal incidence reported in married and unmarried women that are in line with previous study conducted by Modak et al³¹ in India Ranjit et al²⁶ in Nepal. When marital status was considered part of model it was found to be significant contributor towards BV which coincides with the study of Gad et al²⁸ conducted in Egypt on 100 patients stating the incidence to be higher in married women, 94% prevalence of disease (31 out of 33 diagnosed with BV). BV almost equally prevalent in married and unmarried women but to be married appears an important factor in link with bad hygienic practices, sanitary napkins, age and contraceptive use²⁶.

In the other study, similar results as of our study were seen that was carried out in India on 558 non pregnant reproductive aged women (18-45years) by Torondel et al²⁹. Here the poor hygiene practices during menstrual period were associated with three common infections; with BV having the highest prevalence of 41% and was linked to the use of reusable absorbent material. The lower frequency of personal washing while a higher frequency changing of absorbent material was found protective²⁹. It is also consistent with the study conducted in central Michigan by Holzman et al³² which revealed higher prevalence of BV during first ten days of menstrual cycle. Here the bacterial vaginosis was found influenced by factors such as hormonal changes, elevated vaginal pH accompanying menstruation, products used during menses (sanitary napkin type), and sexual practices (contraceptive use).

Significant difference was found between patients using different methods of contraception with highest prevalence seen in our study among those using BTL as a method of contraception and is in line with a study conducted in Nigeria by Durugbo et al³³ in Nigerian teaching hospital, in which 178 women with tubal factor infertility were recruited and 178 fertile women were taken as control as controls. BV was found in 50 out of 178 (28.1%) with tubal factor infertility while a prevalence of 7.9% (14 out of 178) was seen in fertile women taken as control. The study stated that the risk of the disease was more in patients with tubal factor infertility when they were from low socioeconomic class with significant p-value of ($p < 0.001$). Similarly second highest disease prevalence of 49.4% (44 out of 89 participants) was seen in participants who did not use any method of contraception and only 2.5% prevalence of disease (3 out of 119) in participants who used condom as a method of contraception and zero percent prevalence seen in participants using IUCD as a method of contraception, these findings are consistent with other studies conducted by Nzomo et al²⁷ in Kenya stating association of condom use with less prevalence of disease in which 43 participants used condom and 5 (11.6%) had BV while 40 never used condom and 13 (32.5%) had BV, similarly 11 used IUCD and 3 (27.3%) had BV while 72 did not use IUCD and 15 (20.8%) had disease with an insignificant p value of ($p = 0.67$) and another study conducted by Mascarenhas et al³⁴ on 100 sexually active adolescent females in Salvador, in which 53 participants never used condom and 11 (55%) had disease and 47 always used condom and 9 (45%) had the disease with a significant p value of 0.01 relating infrequent condom use to occurrence of BV. Another study conducted by Bradshaw et al³⁵ on 1093 Australian women aged 16 to 25 years recruited from 29 primary care clinics across Australia on use of contraceptives and sexual behaviors and occurrence of BV linked use of OCP as a protective factor against BV with 497 participants who were not using OCP's with a greater disease prevalence of 14.5% and 572 using OCP's with a lesser diseases prevalence of 8.7% which again supports the results of our study in which 18 participants used OCP's and none had the disease (100%). Similarly in another study conducted by Calzolari et al³⁶ with 1314 women, oral contraceptive and condom use showed a significant protective effect, which is in line with the results of our study against bacterial vaginosis. Our study clearly links BV with BTL as a method of contraception and unprotected sexual activity and may raise the possibility of disease being transmitted from male partner and opens a research gate to assess the male partners of females suffering from BV which could not be done in this study.

CONCLUSION

Married women, with age >35 years, not using any contraceptive measure and using cloth napkin during menses are at a high risk of catching bacterial vaginosis. Among contraceptive methods BTL seems to be the non-protective against BV and need to be investigated properly.

Conflict of interest: Nil

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