

Research Article**Different Type of Vaginal Infection in Pregnancy and Its Risk Factor – A Study in Urban Medical College Hospital of India**Babul Chandra Dey¹, Arnab Kumar Koley², Dhrubajyati Saha², Suman Kumar De², Apurba Saha²¹Medical Officer, Jangipur SD Hospital, Murshidabad, West Bengal²Senior Resident, Chittaranjan Seva Sadan, Kolkata***Corresponding author**

Arnab Kr. Koley

Email: akoley75@yahoo.com

Abstract: The present study aims at determining occurrence of different types of vaginal infection in pregnancy and its relation with age, gravida, demographic profile and thereby about its risk factors. A sociodemographic and microbiological survey was carried out at Antenatal Clinic and labour ward of Calcutta National Medical College and Hospital, Kolkata, India to determine the prevalence of bacterial vaginosis, *Trichomonas vaginalis* and *Candida albicans* vaginal infections in pregnancy and to examine if the infections had any association with some suspected sociodemographic risk factors. The study was carried out between April 2010 and March 2011. The studied population was 100 pregnant women attending the antenatal clinic and labour ward. The data obtained was statistically analyzed by software SPSS 19. Out of 100 consecutive subjects surveyed, most of the pregnant women with vaginal infection fall in < 20 yrs group (48.3%) and in primigravida (62.5%). The prevalence of the individual infections were *C. albicans* 25%, bacterial vaginosis 21%, *T. vaginalis* 4% and 10% intermediate. Most of the infected population in this study hailed from lower socioeconomic strata of the society. Significant difference was found among primigravida and multigravida, different economic status, different residence, type of sanitation, personal cleanliness, previous H/O MTP, previous H/O OCP in the occurrence of normal flora and vaginal infection. But no significant difference was found among illiterate and other group in the occurrence of normal flora and vaginal infection. Continuous antenatal screening should be an ongoing process for all symptomatic pregnant women using careful history, examination and old traditional cheaper laboratory methods. Proper assessment and education regarding risk factor of vaginal infection is essential to reduce the burden of vaginal infection in pregnancy in community.

Keywords: Vaginal Infection-Pregnancy-Risk Factor**INTRODUCTION**

The combination of vaginal infection and pregnancy is quite common. Women have some symptoms in the form of external and internal irritation, itching, discomfort, unpleasant odour, profuse discharge, dyspareunia etc. Some vaginal infections may remain asymptomatic. Normally, there is increased vaginal transudate during pregnancy due to increased vascularity and hyperoestrogenism. The discharge is mucoid in nature and nonirritating. Secretion also becomes copious, thin and curdy white due to marked exfoliated cells and bacteria.

Though physiological protection exists, some women are quite prone to develop vaginal infection due to some pathologic flora invading or replacing the normal commensals with its deleterious effect leading to pregnancy and perinatal complications. The causative organisms of vaginal infections are mostly diagnosed as being *Candida albicans*, *Trichomonas vaginalis*, *Chlamydia* and those of bacterial vaginosis – *Hemophilus vaginalis*, *Gardnerella vaginalis*, and *Mobiluncus*.

Bacterial vaginosis is the commonest cause of abnormal vaginal discharge. It is among the diseases

that most frequently associated with vaginitis. The prevalence of bacterial vaginosis is between 10-31% in pregnant women. Centers for disease control and prevention (CDC) advise that all pregnant women with BV symptoms be screened and treated with antibiotics (CDC, 2002) [1]. Poor hygiene, sexual intercourse, low socioeconomic status are associated with significant increase in the prevalence of bacterial vaginosis. The only well proven risk factors for vaginal candida infection are pregnancy, diabetes mellitus (CDC, 2002) [2] and the use of broad spectrum antibiotics [3] as well as oral contraceptive with high oestrogen content (Odds, 1988). Poorly supported risk factors include use of sponge, intrauterine devices (IUDs), diaphragms, condoms, orogenital sex, douching and intercourse [3,4] and diet with high glucose content [5].

A thorough microbiological evaluation of each patient is the most accurate means of assessing risk related to vaginal flora. The present study aims at determining occurrence of different types of vaginal infection in pregnancy and its relation with age, gravida, demographic profile and thereby about its risk factors.

MATERIALS AND METHODS

This Prospective, randomised, analytical study was conducted in antenatal clinic and labour ward, Department of Gynaecology & Obstetrics, Calcutta National Medical College & Hospital, Kolkata for one year from April'10 to March'11. The studied population was 100 pregnant women attending the antenatal clinic and labour ward. Informed consent was taken from all the mothers and the study was approved by ethical committee of this institution. The symptomatic patients with duration of pregnancy more than 12 wks of gestation, with intact membrane and patient attending for regular follow-up in antenatal clinic were included in the study. Pregnant mother less than 12 wks, those who were treated with antibiotics, fungicides outside and mother coming with prolonged rupture of membrane to labour ward were excluded from study population. Patients were enrolled. After proper history taking regarding symptoms, inspection and examination of external genitalia and inner thigh was done. By speculum examination, the character of vaginal discharge and stickiness to the vaginal epithelium were noted. The appearance of the cervical and vaginal

epithelium was also noted. Secretion from posterior fornix was taken by a swab. Wet mount preparation and KOH preparation of vaginal discharge was done and seen under microscope to look for the causative organisms. Gram stain of vaginal smear was assessed for the bacterial vaginosis on the basis of Nugent's criteria⁵. The data was recorded and analysis were done by following the standard statistical procedure and using statistical software SPSS -19. Data was presented in the form of table and p value was calculated by chi-square test.

RESULTS AND ANALYSIS

In this study most of the pregnant women with vaginal infection fall in < 20 yrs group and noninfected case were most frequently distributed in 21-25 yr age group but no significant difference was found between infected and noninfected group [Table 1] (Chi square test (χ^2) = 2.59, Degree of freedom (df) = 3, P value = 0.459). Minimum age is 18 years, Maximum age 40 years, Mean age 22.94 years SD: 3.89

Table1: Frequency of age groups in pregnant women in this study

Age group in year	Infected (n-60)	Non-infected (n-40)	Total (n-100)
≤ 20	29(48.3%)	14(35%)	43
21 – 25	18(30%)	16(40%)	34
26 – 30	12(20%)	8(20%)	20
> 30	1(1.7%)	2(5%)	3

The incidence of normal flora was maximum in primigravida (62.5%) & minimum in Gravida 3. On contrary Gravida 3 show the maximum incidence of BV (42.85). Candida infection is most common in Gravida 2 and Gravida 3 and Trichomoniasis is most common in Gravida 3 (50%). [Table 2]. So vaginal

infection was found to be most frequent in Gravida 3. Statistically significant difference was found in the occurrences of normal flora and different vaginal infections among primigravida and multigravida (chi Square χ^2 = 13.568, df = 4, p value = 0.009).

Table 2: Relationship between Gravida status of women and different vaginal infections

Gravida	Normal (n-40)	Candida (n-25)	Trichomonas (n-4)	Intermediate (n=10)	BV (n-21)	Total
Primi-Gravida	25(62.5%)	6(24%)	1(25%)	6(60%)	4(19.04%)	42
Gravida 2	14(35%)	8(32%)	1(25%)	3(30%)	5(23.8%)	31
Gravida 3	0	8(32%)	2(50%)	1(10%)	9(42.85%)	20
Gravida 4	1(2.5%)	3(12%)	0	0	3(14.28%)	7

In the demographic profile, vaginal infections were common in both literate women and those with secondary education. Illiterate group in this study comprised of only 8 women of whom 7(87.5%) were infected, making it the commonest infective group. No significant difference was found among illiterate and other group in the occurrence of normal flora and vaginal infection (χ^2 = 1.636 (Yates corrected) df = 1 p value = 0.201 (Fisher exact). Most of the study population belonged to the lower middle economic status (43%) and included most of the infected

population (47.5%). Significant difference was found among different economic status in the occurrence of normal flora and vaginal infection (χ^2 = 13.948, df = 3, p value = 0.003). Urban population was commonest (46%) of which 50% were infected, but 86.36% of women residing in urban slum and 56.25% of women residing in rural area were infected. Significant difference was found among different residence in the occurrence of normal flora and vaginal infection (χ^2 = 8.475 df = 2 p value = 0.014). Most of the infected women used common toilet (43.33%) and

31.66% did not have a proper toilet. Significant difference was found among type of sanitation in the occurrence of normal flora and vaginal infection ($\chi^2 = 10.829$, $df = 2$, $p = 0.004$). 61.66% of infected women had poor personal cleanliness, 31.66% of infected

women had average personal hygiene. Significant difference was found among personal cleanliness in the occurrence of normal flora and vaginal infection ($\chi^2 = 57.520$, $df = 2$, p value = 0.000) [Table 3]

Table 3-Demographic profile

		Normal (n-40)	Candida (n-25)	TV (n-4)	Interm (n-10)	BV(n-21)	Total
Educational Status	Illiterate	1(2.5%)	1(4%)	2(50%)	3(30%)	1(4.8%)	8
	Literate	20(50%)	12(48%)	1(25%)	3(30%)	12(57.1%)	48
	Secondary	18(45%)	11(44%)	1(25%)	4(40%)	6(28.6%)	40
	Graduate	1(2.5%)	1(4%)	0	0	2(9.5%)	4
Occupation	Working	3(7.5%)	0	0	1(10%)	0	4
	House wife	37(92.5%)	25	4	9(90%)	21	96
Economics Status	Low	4(10%)	9(36%)	2(50%)	3(30%)	6(28.6%)	24
	Lower Middle	15(37.5%)	13(52%)	2(50%)	4(40%)	9(42.9%)	43
	Middle	19(47.5%)	3(12%)	0	2(20%)	5(23.8%)	29
	High	2(5%)	0	0	1(10%)	1(4.8%)	4
Residence	Urban	23(57.5%)	16(64%)	0	0	7(33.3%)	46
	Urban Slum	3(7.5%)	2(8%)	1(25%)	7(70%)	9(42.9%)	22
	Rural	14(35%)	7(28%)	3(75%)	3(30%)	5(23.8%)	32
Type Of Sanitation	Common Toilet	27(67.5%)	13(52%)	1(25%)	3(30%)	9(42.9%)	53
	Separate Toilet	11(27.5%)	9(36%)	0	1(10%)	5(23.8%)	26
	No Definite Space /make- shift toilet	2(5%)	3(12%)	3(75%)	6(60%)	7(33.3%)	21
Personal Cleanliness	Good	33(82.5%)	2(8%)	0	1(10%)	2(9.5%)	38
	Average	5(12.5%)	7(28%)	1(25%)	3(30%)	8(38.1%)	24
	Poor	2(5%)	16(64%)	3(75%)	6(60%)	11(52.4%)	38

17% of the study population had H/O previous MTP out of which 64.7% were noninfective and 35.3% were infective, of which BV was the commonest and it is statistically significant ($\chi^2 = 5.21$, $df = 1$, p value = 0.0225).

Regarding history of OCP use, 19% of the study population had used OCP prior to current pregnancy of which 63.2% had no infection and 36.8% had vaginal infection of which candida was commonest (26.32%). Previous use of OCP and occurrence of infection was significant ($\chi^2 = 5.24$, $df = 1$, p value = 0.022).

DISCUSSION

In this study 43% of women were in age group <20 yrs, 34% in age group 21-25 yrs, 20% in age group 26-30 yrs and 3% in age group >30 yrs. Infection was most prevalent in age group <20 yrs (48.3%) and least in >30 yrs age group (1.7%). Of the entire study population

60% were infected. In a study by Manigeh Mehdinejad et al [6] in Iran 23.33% of the study population were below <20 yrs and 30% in age group of 21-25 yrs, 22.5% in age group 26-30 yrs and 24.16% above 30 yrs. The difference with the current study is probably due to lower age at marriage and poverty in this study.

Here, of the 100 patients screened normal vaginal flora were found mostly in primigravida (62.5%). The prevalence of vaginal infection was most frequent among gravida 3 (100%), of which Trichomoniasis and BV were the most common. Bhalla [7] showed that BV had a positive correlation with parity more than 2 and with low socioeconomic status. In our study also infection is more common in gravida 3. Infection in general was more common in multigravida with Candida emerging as the most

frequent infection (32.8%) followed closely by BV(29.3%).

Generally bacterial vaginosis affects women of reproductive age indicating a possible role of sex hormones in the pathogenesis [8]. If sexual intercourse were a risk factor for bacterial vaginosis, then women with bacterial vaginosis would also be co infected with other sexually transmitted disease (STDs. Sexual transmission is also associated with number of sexual partners, decreased rate found with monogamous couple. *G. Vaginalis*, *Mycoplasma hominis* and *mobiluncus* species often can be isolated from the urethra of male partners of women with bacterial vaginosis[9]. Evidence against sexual transmission of the anaerobic component of this polymicrobial syndrome was the finding of *G. Vaginosis* in women who had never had sex. The most convincing evidence against sexual transmission has been the failure to demonstrate benefits in treating male partners of women with bacterial vaginosis[10] as measured against recurrence of bacterial vaginosis[11,12].

In this study illiterate pregnant women were found to have vaginal infection mostly(87.5%) but it is difficult to comment as this comprised the smallest group in the study population. Most of the study population were Below Poverty Line and the prevalence of infection was most frequent in this group.

The women in my study group came from urban area(excluding slums) and the prevalence of infection was less than the other two groups namely those from urban slums and rural areas. Women who shared toilet or had no definite space for use as a regular sanitary toilet had a higher prevalence of vaginal infections. This was also true for women having poor personal hygiene.

As the study population comprised mostly of housewives it is difficult to correlate the prevalence of infection with type of occupation. In a study by Minkoff H *et al* [13], women of lower socioeconomic status had increased incidence of BV. Thakur *et al*[14] found that colonisation with *G. Vaginalis* was more common among women of low socio economic status, who were non pregnant, nulliparous, in the postovulatory stage of menstrual cycle and one using non protective contraceptives. The natural history of bacterial vaginosis has been understood poorly. The triggers for the change in vaginal flora are not identified.

In recent studies among obstetric population, the reported prevalence of BV ranged from a low of 10% among private patients to a high of 35% among women reporting low monthly income and low education level, although these studies did not adjust for race. In this study also most of the BV were from low socio-economic status. A study from Papua New Guinea

found no co relation between vaginal infections during pregnancy and sociodemographic profiles[15].

CONCLUSION

Most of the infected population in this study hailed from lower socioeconomic strata of the society. Continuous antenatal screening should be an ongoing process for all symptomatic pregnant women using careful history, examination and old traditional cheaper laboratory methods. Proper assessment and education regarding risk factor of vaginal infection is essential to reduce the burden of vaginal infection in pregnancy in community. Though risk factor may vary in different population due to presence of difference in education level .culture and socioeconomic condition .

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