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Research Article

## Prevalence of vaginitis during pregnancy and its fetomaternal outcome in the rural setup

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### ABSTRACT

**Background:** Increasing evidence associates abnormalities in vaginal flora during pregnancy with preterm labor and delivery with potential neonatal sequelae due to prematurity and poor perinatal outcome. So the objective of this study is to study the prevalence of different type of vaginal infection during pregnancy and its fetomaternal outcome.

**Methods:** This study was conducted in the Department of Obstetrics and Gynecology and with the help of Dept of Microbiology in Adichunchanagiri institute of Medical College (AIMS) BG Nagar, over a period of one year extending from October 2013 to September 2014. This study was conducted on 920 pregnant women, evaluated for vaginitis during pregnancy and studied for the fetomaternal outcome.

**Results:** After vaginal microflora evaluation of the 920 women, revealed that 840 (91.3%) women had normal vaginal flora, 38 (4.13%) of them were diagnosed as candidiasis, and 26 (2.83%) had BV, 10 (1.09%) had Trichomoniasis and 6 (0.65%) had mixed infection. From 80 patients with vaginitis, 35 of them had PROM (term and preterm), 22 of them had preterm delivery, 11 of them had anemia, 6 of them had oligohydramions and 10 of them had puerperal sepsis with vaginitis during pregnancy. So the association of vaginitis with fetomaternal outcome was highly significant ( $p < 0.0001$ ).

**Conclusions:** Vaginal ecosystem study with the detection of pathogens is a key instrument in the prevention of preterm delivery, pPROM, chorioamnionitis, neonatal, puerperal and maternal-fetal infections.

**Keywords:** Vaginitis, Bacterial vaginosis, Clinical diagnosis, Pregnancy, Candidiasis

### INTRODUCTION

Vaginal discharge is one of the most common complaints of pregnant women. The discharge may be the result of normal physiologic adaptations of pregnancy or may result from infectious vaginitis. The activity of *Lactobacillus* is essential to protect women from genital infections and in normal conditions, *Lactobacillus* utilizes available glycogen produce lactic acid, which is able to acidify the vaginal pH to less than 4.5, inhibiting the growth of non-acid tolerant microorganisms, known as potentially pathogenic. During pregnancy, alterations in estrogen and progesterone levels induce physiological changes, such as PH values, in the lower genital tract of pregnant women,

and such physiological changes will result in vaginal mucosa congestion and hypertrophy, which benefit growth of anaerobic bacteria and other pathogenic microorganisms within the vagina. The most common causes of infectious vaginitis in pregnancy are Bacterial vaginosis (BV), Candidiasis and Trichomoniasis. BV is characterized by a change from normal *Lactobacillus* dominated flora to a mixed flora consisting of *Gardnerella vaginalis*, *Mycoplasma hominis*, *Mobiluncus* species and other anaerobes.<sup>1</sup> BV has been linked to many gynecological conditions like pelvic inflammatory disease (PID), posthysterectomy infections and postabortal PID.<sup>1</sup> Certain obstetrical complications like preterm labor and preterm delivery premature rupture of

membranes (PROM), amniotic fluid infections and postpartum endometritis have been linked to occurrence of BV during pregnancy.<sup>1,2</sup> Candida vaginitis is responsible for 80% to 90% of infections during pregnancy.<sup>4</sup> It is characterised by vulvar and vaginal pruritis, external dysuria, white cottage cheese discharge, and vulvovaginal excoriations. Treatment is by local application of antifungals results in relief of symptoms and eradication of yeast in 70% to 90% of the cases. Trichomoniasis is caused by *T. Vaginalis*, a sexually transmitted anaerobic protozoan. It is characterised by greenish yellow frothy discharge with pruritis, it is associated with preterm labour and neonatal sepsis.<sup>5</sup> Trichomoniasis can be diagnosed by saline wet mount preparation and also by cultures using Diamond media, but culture requires 3 to 7 days for the growth.<sup>5</sup> Since, different type of vaginitis can be associated with pregnancy complications, we undertook this study to know the prevalence of vaginitis in pregnant women attending antenatal clinic and its correlation with adverse pregnancy outcome.

## METHODS

The study was conducted in the Dept. of Obstetrics and Gynecology and with the help of Department of Microbiology in Adichunanagiri institute of medical sciences, Mandya, Karnataka, India over a period of one year extending from October 2013 to September 2014. This study was conducted on 920 pregnant women. Inclusion Criteria was Single pregnancy and Period of gestation <28 weeks as calculated by last menstrual period or first obstetrical ultrasound if the women was not sure of her last menstrual period. Exclusion Criteria was Women with history of previous preterm labor or threatened preterm labor, Women with known obstetrical complications, which can be a confounding factor for preterm labor such as antepartum hemorrhage, severe

anemia, pregnancy-induced hypertension, essential hypertension, multiple gestation, existing kidney or heart disease, structural and functional abnormalities of the uterus and chronic documented urinary tract infection, Cases where preterm labor was induced for any obstetrical and medical condition.

Written and informed consent in patients own language was taken before enrolling patients for the study. Women with period of gestation <20 weeks and no vaginitis at first visit were followed up again at 20 weeks and 28 weeks to assess for the presence of vaginitis. Those women with period of gestation between 20 and 28 weeks and no vaginitis at first visit were followed up after their primary visit again at 28 weeks to assess for presence of vaginitis. A detailed history and examination was done in all the antenatal women. All women were subjected to routine antenatal investigations. Apart from the routine investigations, vaginal secretion/discharge were sent to detect BV by Nugent's criteria, Amsels criteria, Candidiasis by KOH preparation, gram staining, Trichomonas vaginitis by saline wet mount preparation and culture of vaginal secretions.

## RESULTS

**Table 1: Types of vaginal infection in the study cases.**

	N(920)	Percentage
No pathogens	840	91.3
Candidial infection	38	4.13
Bacterial vaginosis	26	2.83
Trichomonas infection	10	1.09
Mixed infection	6	0.65

F value = 410.59; P value = <0.0001; Significant P value = <0.05.

**Table 2: Correlation of vaginal infection with adverse maternal outcome.**

Outcome	No pathogen n(840)	%	Candidial infection n(38)	%	Bacterial vaginosis n(26)	%	Trichomonas infection n(10)	%	Mixed infection n(6)	%	X <sup>2</sup> value	p-value
Preterm delivery	58	6.9	11	28.9	7	26.9	2	20	2	33	40.1	<0.0001(S)
Term PROM	34	4.04	3	7.89	8	30.8	3	30	4	67	88.2	<0.001(S)
Preterm PROM	42	5	6	15.8	8	30.8	2	20	1	16	38.2	<0.001(S)
Anemia	20	2.38	4	10.5	6	23.1	0	0	1	16	43.1	<0.001(S)
Chorioamionitis	12	1.43	1	2.63	2	7.7	0	0	0	0	6.67	<0.154(NS)
Oligohydramions	6	0.71	1	2.63	3	11.5	0	0	2	33	71.9	<0.001(S)
Pueperial sepsis	0	0	4	10.5	6	23.1	0	0	0	0	158	<0.001(S)

Mean X<sup>2</sup>=46.9; Degree of freedom (DF) = 24; P value = 0.003 significant.

Table 1 show the different type of vaginitis in pregnant women and the most common infection is Candidial infection 4.13%. About 91.3% had no pathogens. Table 2 shows significant correlation of PROM (term and preterm) preterm delivery, anemia, oligohydramions and pueperial sepsis with vaginitis during pregnancy.

After vaginal microflora evaluation of the 920 women revealed that 840 (91.3%) women had normal vaginal flora, 38 (4.13%) of them were diagnosed as candidiasis, and 26 (2.83%) had BV, 10 (1.09%) had Trichomoniasis and 6 (0.65%) had mixed infection as shown in Table-1. Out of the 80 women who had vaginitis, 36 (45%)

women were in the age group of 21-25 years, 27 (33.7%) were in the age group of 26-30 years, 13 (16.3%) belonged to the age group  $\leq 20$  years and 4 (5%) women were in the age group  $\geq 31$  years. The distribution of women with vaginitis according to age was not significant ( $p = 0.23$ ). 58 (72.5%) antenatals with vaginitis belonged to the lower socioeconomic class as opposed to 22 (27.5%) who belonged to the lower class. This distribution shows that vaginitis patients are significantly distributed in lower class ( $p < 0.0001$ ). 44 (55.1%) women with vaginitis were in the gestation period between 11-20 weeks with the remaining 36

(44.9%) being in the gestation period between 21-28 weeks. This distribution was not significant. 58 (72.5%) women with vaginitis were nulliparous, 16 (20%) were primipara, 4 (5%) were second para and the remaining 2 (2.5%) were para three and above. This shows that vaginitis is significantly seen among nulliparous women ( $p < 0.001$ ).

Table 3 shows overall non-significant correlation with vaginitis and fetal outcome. The most common fetal complication was prematurity among all types of vaginitis.

**Table 3: Correlation of vaginal infection with adverse fetal outcome.**

Outcome	No pathogen n(840)	%	Candidial infection n(38)	%	Bacterial vaginosis n(26)	%	Trichomonas infection n(10)	%	Mixed infection n(6)	%	X <sup>2</sup> value	p-value
Abortion	12	1.43	1	2.6	4	15.3	0	0	1	16.7	31.5	<0.001(S)
LBW	4	0.47	3	7.9	6	23.1	0	0	0	0	105	<0.001(S)
Prematurity	31	3.5	2	5.3	8	30.7	1	10	3	50	66.5	<0.001(S)
IUGR	18	2.14	3	7.9	5	19.2	3	30	2	33.3	64.7	<0.001(S)
Still birth	22	2.62	6	15.8	4	15.4	2	20	1	16.7	37.5	<0.001(S)
Neonatal death	6	0.71	0	0	1	3.8	0	0	0	0	3.72	<0.446(NS)
NICU admission	76	9.04	14	36.8	10	38.5	8	80	2	33.3	93	<0.001(S)
Neonatal jaundice	51	6.1	16	42.1	10	38.5	2	20	1	16.7	91.8	<0.001(S)

Mean X<sup>2</sup>=37.4; Degree of freedom (DF) = 28; P value = 0.11 non-significant.

## DISCUSSION

The bacterial infections in the lower female reproductive tract are a common reason of reproductive tract infection resulting in adverse perinatal outcome. It is reported that vaginitis in pregnancy is related to adverse perinatal outcome<sup>4</sup>. Education level and occupation are two risk factors related to incidence of vaginitis in pregnant women, study by Zhang et al.<sup>6</sup>

According to a study by Lavett, BV is less common in pregnant than in nonpregnant women (23% vs 33%) Govender et al found BV in 52% of the women studied at 30 weeks or more of gestation and was the commonest infection diagnosed.<sup>2</sup> In our study, out of 920 antenatal women, 840 (91.3%) had normal vaginal flora, 38 (4.13%) had Candidiasis and 26 (2.83%) had BV. The fetus is protected from microorganism infection by the cervix, which controls and limits microbial infection by production of immune cytokines, and antimicrobial molecules.<sup>3</sup> If this barrier is affected, bacteria may enter the uterine cavity, leading to adverse perinatal outcome. Therefore, improving women's living ways and knowledge regarding reproductive health issues will help decrease the incidences of vaginitis and reduce adverse pregnancy outcomes. Association of BV and prematurity in Indonesia was studied by Riduan et al. In our study,

preterm delivery occurred in 22 out of 80 pregnant women with vaginitis. Out of these 80 antenatal women with vaginitis 11 had Candidiasis, and 7 had BV. This association was highly significant ( $p < 0.0001$ ). In the study by Gravett et al, BV was significantly associated with PROM (odds ratio 2:4). In our study also, PROM occurred significantly among BV patients ( $p < 0.001$ ). The limitation of our study is that prevention and treatment of vaginitis during pregnancy is not studied.

## CONCLUSION

Though vaginal discharge is physiologic during pregnancy, pathologic vaginitis is also common during pregnancy and it is associated with adverse perinatal outcome like PROM and preterm delivery as studied from our study. So it is necessary to check for abnormal vaginal discharge and early diagnoses and treatment can prevent the adverse perinatal outcome due to vaginitis.

Informed consent was obtained from all patients.

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