A Study Of Microorganism Profile In High Vaginal Swab (HVS) Sample Of Pregnant Patients Diagnosed As Threatened Preterm Labor

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ABSTRACT

Background: Preterm labor is a difficult problem that affects perinatal morbidity and mortality globally. Incidence of premature birth worldwide is 6-11%. Maternal and fetal complications cause preterm birth in 30-40% of causes and the remaining 60-70% are due to subclinical infections or any inflammatory cause like genitourinary infection

Aim and Objective: The present study was aimed to study microorganism profile in High Vaginal Swab (HVS) sample of pregnant patients diagnosed as threatened preterm labour.

Methodology: In Ghaziabad, Santosh Medical College and Hospital, between the dates of April 19, 2019, and September 30, 2020, a case control observational study was done. Out of the 120 pregnant women enrolled, 60 were assessed to be at risk for preterm delivery and were placed in the case group. The other 60 antenatal women who had reached 37 weeks of gestation but were under 40 weeks along with no pregnancy complications were placed in the control group. Pregnant women were screened in order to collect data based on their medical histories, physical examinations, and laboratory results.

Result: Per speculum examination revealed that in the control group only 30% patients had abnormal discharge where as in case group 78.3% patients had abnormal discharge. There was statistically significant (p=0.0001) difference in per speculum examination between cases and controls.

Conclusion: In conclusion, Gardnerella vaginalis has been identified as the most common isolate among the pathogens from HVS. Multi drug resistance in isolates indicates the

importance of early culture and sensitivity for deciding empirical antibiotics in such patients, if they develop post natal uterine infections.

Keywords: Microorganism, High Vaginal Swab (HVS), Per speculum examination, preterm labor.

INTRODUCTION

Urinary tract infections (UTIs) account for the majority of hospital visits worldwide and are one of the leading causes of morbidity and co-morbidities in patients with underlying illnesses. Women in the reproductive age range often have an acidic vaginal pH (4.5). Typically, this shields the vagina from typical pathogenic infections. By producing lactic acid, this bacillus keeps the vagina's pH at an acidic level. A lack of estrogen in the vagina and a weakened immune system brought on by diabetes or other related vaginal conditions might promote the formation of aberrant flora, which may then result in infections.

Women in the reproductive age range are carriers of a variety of pathogens, including Candida, Listeria, Group B Streptococci, and Escherichia coli (E. coli). E. coli, which has a high correlation with preterm birth and newborns with very low birth weight, can lead to neonatal illnesses like sepsis, meningitis, and necrotizing enterocolitis, which can be fatal. E. coli can enter the chorioamnion or amniotic fluid during transit through the birth canal or prior to delivery, which can cause difficulties. [1-4]

There are various reasons for the conduction of this study; firstly, the purpose or rationale is to understand the reason for high risk of infection. Even though many studies like Ronald and Alfa (1996) [5] and Giraldo et al. (2012) [6] in particular have mentioned them as usual feature during pregnancy, the pathophysiology and the sources of the infection by different microorganisms will be explored with the help of literature review and past publications.

Based on the literature and the published papers on the relationship between genitourinary infections and preterm labour and its impact on the foetus; the most important problem found is that, no study mentions a specific guideline or framework for the prevention and control of these infections especially in case of pregnancy. Similarly, some microbes also affect the bladder of pregnant women and in some cases infections lead to sepsis in new-borns.

MATERIALS AND METHODS

From April 2019 to September 2020, this case control study was carried out at the Santosh Medical College and Hospital in Ghaziabad's Department of Obstetrics and Gynecology. 364 patients in total were initially examined for study inclusion.

All pregnant patients who visited the obstetrics and gynecology department comprised the study's sample population. Out of 971 total patients, 364 pregnant women were initially screened. 120 subjects in total were chosen at random based on the inclusion and exclusion criteria. Other obstetric problems and patients with genital tract cancer were not excluded

from the case group. The patient's language was used to obtain their informed consent. There were two groups made up of the patients.

Group I consisted of 60 pregnant patients diagnosed as threatened preterm labor and preterm labor between 28 to 37 completed weeks of gestation.

Group II consisted of 60 pregnant women with 37 weeks of gestation or more with no history of preterm labor.

Demographic details, information on previous pregnancies, physical characteristics like BMI, and other details make up the majority of descriptive information. All of the women were assessed based on a thorough review of their medical histories, with particular attention paid to any prior preterm births, problematic obstetric histories, and urogenital infections. All women received systemic, obstetrical, and general physical exams. Before performing the initial vaginal examination, a sample from the posterior fornix of the vagina was collected using two sterilized swabs and under direct vision using a Cusco/Sims speculum. The sample was then examined for gram stain characteristics, culture-sensitivity using standard methods, and saline wet mount for BV, VC, and trichomoniasis. A midstream urine sample was sent for culture-sensitivity and cytology. In the Department of Microbiology at our institute, urine and high vaginal swabs underwent microbiological analysis and antibiotic sensitivity testing. When necessary, tocolytics or steroid therapy (for pregnancies under 34 weeks) were administered to the women who were admitted with preterm labor.

The study's findings were gathered and presented in a tabular format. Chi-square statistical analysis was carried out using SPSS software. Statistics were considered significant if P < 0.05.

RESULTS

A total of 120 women in the obstetrics and gynecology department at Santosh Medical College & Hospital participated in the current prospective case control study. Two groups of subjects were created: the case group (60 women) and the control group (60 women).

Table1: Demographic data distribution of study subject.

Demographic Distribution		Number (Percentage)	
		Control(n=60)	Case(n=60)
Age Group(Years)	20-24	24 (40%)	27 (45%)
	25-29	31 (51.7%)	29 (48.33%)
	>30	5 (8.33%)	4 (6.66%)
Parity	Primigravida	13 (21.66%)	11 (18.33%)
	Multigravida (>2)	47 (78.33%)	49 (81.66%)
Body Mass	Underweight	18 (30%)	32 (53.33%)

Index (BMI)	Normal	34 (56.66%)	22 (36.66%)
	Overweight	6 (10%)	6 (10%)
	Obese	2 (3.33%)	0 (0%)

According to Table 1, the majority of patients in the control group and case group were between the ages of 25 and 29, or 51.7% and 48.3%, respectively. Compared to the case group, where 18.3% of patients were primigravida and 81.7% were multigravida, 21.66% of control group patients were primigravida and 78.33% were multigravida. According to BMI, the majority of patients in the control group (56.66%) fell into the Normal category, while the majority of patients in the case group (53.33%) were underweight.

Table2: Per speculum examination between cases and controls.

Per speculum examination	Number (Percentage)		P value
	Control(n=60)	Case(n=60)	
Abnormal discharge	18 (30%)	47 (78.3%)	0.0001 (S)
Normal discharge	42 (70%)	13 (21.7%)	

Per speculum examination revealed that in the control group only 30% patients had abnormal vaginal discharge where as in case group 78.3% patients had abnormal vaginal discharge. There was significant (p=0.0001) difference in per speculum examination between cases and controls. (Table 2)

Table 3:High Vaginal Swab (HVS)between cases and controls.

Microorganisms identified	Number (Percentage)		Pvalue
	Control(n=60)	Case(n=60)	
Gardnerella vaginalis	8 (13.33%)	25 (41.66%)	
Trichomonas vaginalis	3 (5%)	10 (16.66%)	
Candida albicans	2 (3.33%)	7 (11.66%)	0.0001 (S)
Others	1 (1.66%)	3 (5%)	
Negative	46 (76.66%)	15 (25%)	

As shown in Table 3, Three main microorganisms identified from High Vaginal Swab (HVS) were Gardnerella vaginalis, trichomonas vaginalis and candida albicans at 13.33%, 5% and 3.33% respectively in the control group and 41.66%, 16.66% and 11.66% respectively in the case group, which is significantly higher. There was significant (p=0.0001) difference in HVS between cases and controls.

DISCUSSION

Preterm labor (PTL) is the onset of labor with intact membranes between the weeks of 28 and 37 of gestation. About two thirds of preterm births—6–8 percent of all deliveries—take place between 34 and 37 weeks of pregnancy. One of the leading causes of newborn and infant illness and mortality is prematurity, which frequently strikes low risk women without warning.

Preterm labor's cause is not fully known, but a multifactorial etiology has been proposed. Preterm labor may be caused by infection and inflammation, according to a large body of research (Lumley, 1993) [7]. According to Verma Indu et al. (2014) [8], urogenital infections are a key contributor to the causes of premature labor that can be avoided.

The current case control study was conducted at Department of Obstetrics & Gynaecology, Santosh Medical College and Hospital, Ghaziabad with the objective to study microorganism profile in High Vaginal Swab (HVS) sample of pregnant patients diagnosed as threatened preterm labor. The majority of patients in our study's control group and case group, or 51.7% and 48.3%, respectively, were between the ages of 25 and 29. In the Patel et al. (2015) [9] study, the mean age group for cases (preterm labor) was 22.88 years, whereas it was 23.82 years for the control group. The participants in the study by Nsereko et al (2020) [10] had a mean age of 28.12 ± 6.01 years, and 82.8% (n = 303) of them were between the ages of 20 and 35.

In our study, the control group had patients who were 21.66% primigravida and 78.33% multigravida, whereas the case group had patients who were 18.3% primigravida and 81.7% multigravida. This result is consistent with the Patel et al (2015) [9] study, in which primipara women made up 72% of the case group while 74% of the control group. Past research found a connection between PTL and nulliparous women, as well as previous preterm birth or abortion (Ezechi et al, 2003[11]; Kozuki et al, 2013[12]).

This study revealed that on per speculum examination in the control group only 30% patients had abnormal vaginal discharge where as in case group 78.3% patients had abnormal discharge. There was significant (p=0.0001) difference in per speculum examination findings between cases and controls. This can be related to the presence of pathogenic microorganisms which may be present in the genital flora.

In our study, three main microorganisms identified from HVS were Gardnerella vaginalis, trichomonas vaginalis and candida albicans at 13.33%, 5% and 3.33% respectively in the control group and 41.66%, 16.66% and 11.66% respectively in the case group, which is significantly higher. There was significant (p=0.0001) difference in HVS between cases and controls.

Ghunage et al (2017) [13] reported that in high vaginal swab test, culture was found to be positive in 18(36%) preterm labour patients and 6(12%) full term labour patients. However,

in 32 (64%) of preterm labor patients and 44(88%) of full term labour patients, it was found to be negative. Srilakshmi Yarlagadda et al (2018) [14] reported that vaginal infection was present in 33.62% cases, which was statistically significant, Candida being the most common microorganism (31.03%) in High vaginal swab cultures. Other microorganisms that were reported were Staphylococcus aureus and mixed microbes.

CONCLUSION

In our study three main microorganisms identified from HVS were Gardnerella vaginalis, trichomonas vaginalis and candida albicans at 13.33%, 5% and 3.33% respectively in the control group and 41.66%, 16.66% and 11.66% respectively in the case group, which is significantly higher. There was statistically significant (p=0.0001) difference in HVS between cases and controls.

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