ORIGINAL RESEARCH

A study on the fetal outcome in pregnancy associated with Bacterial Vaginosis

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ABSTRACT
Bacterial vaginosis is a condition characterized by an alteration of the vaginal ecology in which the normal flora, dominated by lactobacilli, is replaced by a mixed bacterial flora which includes *Gardnerella vaginalis, Mobiluncus species, Mycoplasma hominis, Bacteroides species* and other anaerobes. This results in the increase in the pH of the vagina due to the reduction in the lactic acid and hydrogen peroxide. Pregnant women with term labour and preterm labour admitted in Obstetrics ward/labour ward are the main study subjects and were enrolled in the study after they gave informed consent for the procedure. Case record form is use to record maternal age, socioeconomic status, gestational age at admission, obstetric history, past history, personal and family history and gestational age during delivery, new born weight and its outcome. Among preterm labour 13 (15.3%) and 5 (5.9%) of neonates had RDS and sepsis. Among term labour only 1 (1.2%) of neonates had sepsis. This shows a statistically significant difference between Preterm labour and Term labour with respect to neonatal complications with P value of <0.001.
Key words: Fetal outcome, pregancy, bacterial vaginosis

INTRODUCTION

Pregnancy is a source of joy and anxiety to the expecting couple. Each pregnancy is a state of high risk to the mother, the goal of which is to have a healthy mother and a healthy child at the end. But it can also be a time of uncertainty. Many women have concerns about what is happening with their baby and wonder "Is everything okay"? Some women have concerns about going into labour early. A normal pregnancy lasts about 40 weeks. Occasionally, labour begins prematurely, before the 37th week of pregnancy.[1,2]

Preterm birth (PTB) is defined as birth before 37 completed weeks of gestation, or fewer than 259 days since the last day of women's menstrual period (LMP) by WHO. Prematurity is the leading cause of perinatal mortality. Approximately 70% of neonatal deaths, 36% of infant deaths and 25-50% of cases of long-term neurological impairment in children can be attributed to preterm birth (ACOG, 2016).[3]

Preterm labour (PTL) and delivery are among the most challenging obstetric complications encountered. PTL is the important single determinant of adverse infant outcome in terms of both survival and quality of life. It complicates about 10% of all pregnancies, of all these 30-35% of it is due to deliberate medical intervention, 40-45% following spontaneous PTL and 30-35% following preterm membrane rupture.[1] PTL is associated with 80% of all perinatal deaths.

The exact cause of PTL is not diagnosed and the etiology is likely to be multifactorial. As many as 50% of spontaneous preterm birth may be associated with infection. This could be an underestimate as many of the causative organisms do not grow in culture. The earlier the gestational age of onset of preterm labour, more are the chances of an infective etiology. The source of infection could be ascending infection from lower genital tract, haematogenous spread through the placenta or through the fallopian tubes.

However, ascending infections is probably the most important cause found to be associated with an increased risk of preterm birth, among which Bacterial vaginosis is a number one cause. Prevalence of BV is 15-30% among non-pregnant women and upto 50% among pregnant women.[4]

Bacterial vaginosis is a condition characterized by an alteration of the vaginal ecology in which the normal

flora, dominated by lactobacilli, is replaced by a mixed bacterial flora which includes *Gardnerellavaginalis, Mobiluncus species, Mycoplasma hominis, Bacteroides species* and other anaerobes.[5] This results in the increase in the pH of the vagina due to the reduction in the lactic acid and hydrogen peroxide. It is a vicious cycle in which the overgrowth by the facultative anaerobes is associated with an increase in protease production especially carboxypeptidase which leads to the breakdown of peptides to amines which in an environment of higher pH can become volatile. The development of a more anaerobic environment in turn inhibits the growth of Lactobacilli.[6]

METHODOLOGY
SOURCE OF DATA
Preterm labour and Term labour mother admitted in Department of Obstetrics and Gynaecology.

STUDY DESIGN
Comparative study.

SAMPLE SIZE
Sample size of 170 pregnant women (85 Preterm Labour and 85 Term Labour) sample size calculated to be 169.

INCLUSION CRITERIA
PRETERM LABOUR (GROUP A)
1. Gestational age >28 weeks and < 37 weeks.
2. Regular uterine contraction (4 contraction in 20 min or 8 contractions in 40 min).
3. Cervical dilation > 1 cm and < 4 cm.
4. Effacement of cervix equal to or > 80%.
5. Intact membranes.

TERM LABOUR (GROUP B)
1. Gestational age > 37 weeks and <42 weeks.
2. Regular uterine contraction (4 contraction in 20 min or 8 contractions in 40 min).

3. Cervical dilation > 1 cm and < 4 cm.
4. Effacement of cervix equal to or > 80%.
5. Intact membranes.

EXCLUSION CRITERIA
1) Age equal to <18yrs.
2) Use of antibiotics in the preceding two weeks.
3) Multiple gestation.
4) Cervical cerclage.
5) Structural uterine anomalies.
6) Fetal anomalies.
7) Prior use of tocolytic agents during the current pregnancy.
8) Pregnancy complicated with medical disorders like hypertension, diabetes, chronic renal disease, heart disease.
9) Current use of corticosteroids.
10) Patient not willing to give informed consent.

METHOD OF DATA COLLECTION
Pregnant women with term labour and preterm labour admitted in Obstetrics ward/labour ward are the main study subjects and were enrolled in the study after they gave informed consent for the procedure. Case record form is use to record maternal age, socioeconomic status, gestational age at admission, obstetric history, past history, personal and family history and gestational age during delivery, new born weight and its outcome. Gestational age is calculated from first day of last menstrual period and earliest available ultrasound scan.
Pelvic examination was performed. Colour, consistency and odour of vaginal discharge is noted.

RESULTS
Mean age among subjects with Preterm labour was 22.99 ± 4.139yrs and Mean age among subjects with Term labour was 22.26 ± 12.69yrs. There was no statistically significant difference found between Preterm labour and Term labour with respect to age. P value 0.184.

Table 1: Distribution of subjects according to age among two groups

	Preterm labour	Term labour	Total
18-22yrs	45	48	93
	52.9%	56.5%	54.7%
23-27yrs	28	31	59
	32.9%	36.5%	34.7%
28-32yrs	12	6	18
	14.1%	7.1%	10.6%
Total	85	85	170
	100.0%	100.0%	100.0%

The above table show that in this study, out of 85 preterm labour and 85 term labour majority 45 (53.9%) and 48 (56.5%) women belonged to age group of 18 -22 yrs respectively. 28 (32.9%) women among preterm and 31 (36.5%) women among term labour belonged to age group of 23-27 yrs. 12 (14.1%) women among preterm and 6 (7.1%) women among term labour belonged to age group of 28 – 32 yrs. P value 0.325, there was no statistically significant difference found between Preterm labour and Term labour with respect to age group.

Table 2: Distribution of subjects according to Birth weight among two groups

	Preterm labour	Term labour	Total
Normal	26	75	101
	30.6%	88.2%	59.4%
LBW	53	10	63
	62.4%	11.8%	37.1%
Very LBW	6	0	6
	7.1%	.0%	3.5%
Total	85	85	170
	100.0%	100.0%	100.0%

The above table show, among preterm labour group 53 (62.4%) and 6 (7.1%) of neonates had low birth and very low weight respectively as compared to 10 (11.8%) of neonates in term labour group had low birth weight. P Value <0.001, there was a statistically significant difference found between Preterm labour and Term labour with respect to Birth weight.

Table 3: Distribution of subjects according to NICU admission among two groups

	Preterm labour	Term labour	Total
No	44	80	124
	51.8%	94.1%	72.9%
Yes	41	5	46
	48.2%	5.9%	27.1%
Total	85	85	170
	100.0%	100.0%	100.0%

The above table show that in total 46 (27.1%) of neonates had NICU admission among which 41(48.2%) of neonates belong to preterm labour group as compared to only 5(5.9%) of neonates belong to term labour. This shows a statistically significant difference between Preterm labour and Term labour with respect to NICU admission with P value of <0.001.

Table 4: Distribution of subjects according to neonatal complication among two groups

	Preterm labour	Term labour
RDS	13	0
	15.3%	.0%
Sepsis	5	1
	5.9%	1.2%

The above table show the distribution of neonatal complications. Among preterm labour 13 (15.3%) and 5 (5.9%) of neonates had RDS and sepsis. Among term labour only 1 (1.2%) of neonates had sepsis. This shows a statistically significant difference between Preterm labour and Term labour with respect to neonatal complications with P value of <0.001.

DISCUSSION
In the present study, 61.5% and 23.1% of neonates born to preterm BV positive patient had LBW and VLBW as compared to 62.7% and none among the preterm BV negative patient respectively. This observation inferred that factors other than BV could be responsible for the low birth weight in preterm group like nutritional anemia, low socioeconomic status and low educational status which was present more in preterm group in our present study. Shilpa MN et al. 2013 observed LBW in 90.9% of patients with BV while it was seen in 9.1% of patients without BV. Study done by Hillier et al. also showed the relation of BV with a significantly reduced mean birth weight.[7] Study by Svare et al. also showed lower mean birth weight in bacterial vaginosis.[8]

In our study, in preterm group 50.0% of neonates born to BV positive mothers had neonatal complications as compared to 6.8% born to BV negative mothers. The neonatal complications observed were RDS and sepsis. In term labour group 7.7% of neonates born to BV positive mothers had neonatal sepsis, while none of neonates of BV negative mothers had neonatal complications. This can be explained by the probability that BV had role in the causation of neonatal complications in preterm and term labour. Roy et al. 2006, in their study of 92 patients, observed neonatal complications in preterm labour with BV associated in 26% of cases.[9] Laxmi et al. 2012 observed RDS in 14% of neonates born to patients with bacterial vaginosis.[10]

In our study, the preterm group associated with BV, 76.9% of neonates required NICU admission. Roy et al. 2006 observed 83.3% babies in ELBW group and 40% babies in VLBW group who needed ventilatory support immediately or in subsequent days in

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NICU.[9]Laxmi*et al.* 2012 observed that 15% of neonates with BV positive mothers required NICU admission.[10]

CONCLUSION

- In preterm group the number of neonates who had low birth weight were same in BV positive and BV negative mothers probably other factors like nutritional anemia, low socio economic status and low educational status is responsible for birth weight.
- Neonatal complications like RDS and sepsis was more in neonates born to BV positive (50%) mothers compared to neonates born to BV negative (6.8%) mothers, among preterm labour group. In term labour group there is no significant difference in neonatal complications among BV positive and BV negative mothers.

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