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Bacterial Vaginosis as a Risk of Preterm Labor Among Libyan Women In Zliten City, Libya

Hamed Mohamed FA and Abokresh Eisha GA
Department of Obstetrics and Gynecology, Zliten Teaching Hospital, Zliten, Libya

Abstract:
Bacterial vaginosis is an important risk factor for prematurity and pregnancy morbidity. The relationship between Bacterial vaginosis (BV) and preterm delivery has become well known in recent years. This gives the idea to do the research in this field in their dwelling area. The aim of this study is to find the Bacterial vaginosis as a risk of preterm labor among Libyan women in Zliten city, Libya.
100 cases (50 cases in the study/experimental group and another 50 cases in the control group) were included in this study during November 2018 and October 2019 in Obstetrics and Gynecology department, Zliten teaching Hospital, Zliten, Libya.
The relative risk of the presence of the BV in preterm labor was found to be 2.60%. Also BV was associated with 2.6 fold increased risk for preterm labor at 21 – 25 years old age group. Cases with BV have basic vaginal pH and less number of Lactobacillus sp. Result concludes that there is a positive relations between Bacterial vaginosis and Preterm labor in this study.

Key Words: *Bacterial vaginosis, Preterm labor, Lactobacillus sp., Libyan women and Zliten.*

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I. Introduction:

Bacterial vaginosis (BV) is an important risk factor for prematurity and pregnancy morbidity (Flynn et al., 1999). An imbalance in the normal vaginal bacteria is known as Bacterial vaginosis (Goldenberg, 2000). BV is characterized by high concentration (10^8 to 10^{11} CFU/gm of fluid or greater) of *Gaednerella vaginalis* and a set of potentially pathogenic BV associated microorganisms, most notably *Bacteroides spp*, *peptostreptococcus spp*, and *Mobiluncus spp*, along with *M. hominis*. BV is increasingly recognized as directly related to a number of serious obstetrical and gynecological complications (Lakshmi and Anjum, 2018). Bacteria such as *Lactobacillus lactis* have an intra-vaginal cleansing effect in normal pregnancies, minimizing the presence of common bacterial species (Brocklehurst, 2013). Spontaneous abortion, preterm labour (PTL), premature birth, preterm premature rupture of membranes, amniotic fluid infection and postpartum endometritis are increased because of infection with bacterial vaginosis during pregnancy (Kavya and Aruna, 2019). Bacteria in the female genital produce lipase enzymes in which they can form compounds with the fibrous tissue of the amniotic membrane resulting in an increased risk of rupture of the membrane (Wiraguna, 2018).

However, there are intra-vaginal microorganisms other than *Lactobacillus* species in some pregnancies that cause chorioamnionitis. This is because the normal flora (commensal bacteria) (Bradshaw, 2013) that colonize the vagina during pregnancy do not cause inflammatory conditions or vaginitis, that occurs with infection by pathogenic bacteria (Hilbert, 2016). Chorioamnionitis is the main cause of preterm delivery and various previous reports have stated that chorioamnionitis occurs against a background of BV (Goncalves, 2002). Clinical symptoms of BV include an increase in vaginal pH, vaginal discharge and an unpleasant fishy odor (Donati et al., 2010).

It is therefore important to manage BV first in order to prevent preterm delivery. Metronidazole is the most effective antibiotic for BV (Schuyler, 2016). Treating BV with antibiotics up to gestational week (GW) 20 prevents preterm delivery (McDonald, 2007). The main objective of this research in Zliten city is to find the Bacterial vaginosis as a risk of preterm labor among Libyan women in Zliten city, Libya.

II. Materials And Methods:

The present study was undertaken for a period of one year from November 2018- October 2019 at the department of Obstetrics and Gynecology, Zliten teaching Hospital, Zliten, Libya. 50 Cases with high risk for preterm labor (Study group) and 50 cases with term labor (control group) (Total 100 cases) were included in the study. Detailed demographic data of cases were collected with the help of questionnaire (with the consent of the cases).

Inclusion criteria: Criteria for inclusion of a patient in the study of Preterm Labor were:

- The gestational age between 28 weeks and 35 weeks.
- Painful uterine contractions (frequency of at least one contraction lasting for a minimum of 10-15 seconds during the interval of 10 minutes).
- At least minimal cervical changes (i.e. Bishop score 3 and Cervical dilatation 1 cm).

Exclusion criteria:

- Rupture of membrane and Chorioamnionitis
- Ante partum hemorrhage
- Vaginal Candidiasis
- Meddled outside
- No predisposing factors.

Bacterial Vaginosis was diagnosed with vaginal pH and it was measured using pH paper (HiMedia, India). Vaginal discharge was collected and inoculated in the Lactobacillus selective agar (HiMedia, India) after serial dilutions with physiological saline to enumerate the *Lactobacillus sp.*

III. Results And Discussions:

Bacterial vaginosis (BV) is a common abnormal vaginal condition which is the leading cause of abnormal vaginal discharge and other symptoms worldwide (Lakshmi and Anjum, 2018). The women with bacterial vaginosis were more likely to be unmarried, to be black, to have low incomes and to have previously delivered low-birth-weight infants (Wang, 2014). In a multivariate analysis, the presence of bacterial vaginosis was related to preterm delivery of a low-birth-weight infant (odds ratio, 1.4; 95 percent confidence interval, 1.1 to 1.8) (Sharon, 1995). Age distribution among the study and control group has been shown in Table 1. Majority of the women in both groups were between 21-25 years old. But the control group cases (32%) more than the experimental or study group (25%). Effect of number of previous pregnancies on the preterm labor distribution among the control and study group is tabulated in Table 2. Most of the cases (23% in study group and 17% in control group) are observed in the women with new pregnancies and followed by women with one previous pregnancy.

Table 1: Age distribution among the control and study group.

S. No.	Age Intervals (Years)	Study Group	%	Control Group	%
1	<20	12	12	07	07
2	21-25	25	25	32	32
3	26-30	12	12	10	10
4	31-35	01	01	01	01
	Total	**50**	**50**	**50**	**50**

(% calculated from the total number of 100 cases)

Table 2: Distribution of Previous pregnancies in preterm labor among the control and study group.

S.No	No. of previous pregnancies	Study Group	%	Control Group	%
1	0	23	23	17	17
2	1	17	17	16	16
3	2	09	09	15	15
4	>3	01	01	02	02
	Total	**50**	**50**	**50**	**50**

(% calculated from the total number of 100 cases)

Majority of the cases (45%) had no previous abortion in both the groups. Both the groups matched for the number of previous abortions (Table 3). The previous abortion(s) are not correlated with the preterm labor. Nulliparous women have the preterm labor more in both groups. Table 4 shows the distribution of the Bacterial vaginosis cases in the study group and control group. 18% oc the cases from the total 100 cases were observed with Bacterial vaginosis. The similar result is observed in the study of Giunta (2012).

Table 3: Distribution of preterm labor according to number of previous abortions

S.No.	No of previous abortions	Study Group	%	Control Group	%
1	0	45	45	45	45
2	1	02	02	04	04
3	2	03	03	00	00

4	3	00	00	01	01
	Total	**50**	**50**	**50**	**50**

(% calculated from the total number of 100 cases)

Table 4: Incidence of Bacterial Vaginosis (BV) (Clinical criteria).

S. No.	BV	Study Group	%	Control Group	%
1	Women with BV	18	18	07	07
2	Women without BV	32	32	43	43
	Total	**50**	**60**	**50**	**50**

(% calculated from the total number of 100 cases)

The incidence of BV was higher among the study group (18%) compared to control group (07%). BV was significantly associated with patients in the preterm labor (Table 4). The incidence of preterm birth has remained nearly constant at 7-10% pregnancies. The most popular theory for one cause of preterm labor is an intra-uterine infection. The most common route of intra-uterine infection may be due to the ascending spread of bacteria from vagina and cervix.

Table 5 showed that BV has significantly associated 18% women in this study with 2.60 fold risk for preterm labor. But Holst, et al. (1994) reported that BV was diagnosed in 41% of women who had preterm labor and delivery with a relative risk of 2.1 in Swede. This indicates that the BV incidence rate is lesser than the developed areas like European Union.

Table 5: Relative risk of preterm labor in women with Bacterial Vaginosis.

S. No.	Groups	BV	%	NON-BV	%
1	Study	18	18	32	32
2	Control	07	07	43	43
3	**Relative Risk**	**2.6**	**2.6**	**0.74**	**0.74**
	Total	**25**	**25**	**75**	**75**

(% calculated from the total number of 100 cases)

Table 6 data reveal the relations of the Age and Preterm labor with the BV among the study and control group. Age group 21 – 15 years old show 25% of the preterm labor and BV positive cases in the same age groups is 11%. The percentage of BV cases has positive correlation with the percentage of preterm labor. This indicates that BV has direct influence on preterm labor in the study area.

Table 6: Age and Preterm labor in relation with the distribution of BV among study group and control group.

S. No.	Age intervals(years)	Total No. of Cases	%	BV + ve cases	%
1	<20	12	12	00	00
2	21-25	25	25	11	11
3	26-30	12	12	06	06
4	31-35	01	01	01	01
	Total	50	50	18	18

(% calculated from the total number of 100 cases)

The vaginal microflora is a dynamic ecosystem normally inhabited by lactobacilli. These bacteria support healthy vaginal conditions by maintaining an acidic environment that is inhospitable to other pathogenic microorganisms (Lamont et al., 2011). In this present study, 18% of the cases vaginal pH was basic and the remaining 32% cases in the study group were observed with acidic (Table 7). Vaginal pH has directly proportional to the BV. This pH is mainly maintained by external and internal source/environment of the Vagina especially the vaginal microflora.

Table 7: Distribution of pH among control and Study group.

S. No.	pH	Study Group	%	Control Group	%
1	Basic	18	18	07	07
2	Acidic	32	32	43	43
	Total	**50**	**60**	**50**	**50**

(% calculated from the total number of 100 cases)

The number of Lactobacillus sp. is expressed in the Colony Forming Unit(CFU). The CFU value of the Preterm labor group is $2x10^2$ CFU/gm in the vaginal discharge. But in the control non BV group, the number of Lactobacillus sp. was $7x10^6$ CFU/gm of the vaginal discharge. Vaginal Pathogens in the BV cases are increased which may indirectly affect and decrease the population of *Lactobacillus sp.* So the pH increased to alkali.

Table 8: Number of *Lactobacillus sp*. in both control and Study group

S. No	Groups	CFU/gm of the Vaginal discharge
1	Study	$2x10^2$
2	Control	$7x10^6$

The frequency of Preterm birth has not significantly decreased over the last 30 years despite major advances in obstetric neonatal care. The incidence of preterm birth has remained nearly constant at 7-10% pregnancies (Freitas, 2017). A number of clinical studies have indicated that asymptomatic genital tract infection may play a significant role in preterm birth.

IV. Conclusion And Recommendations

In this study, the presence of BV in patients of preterm labor was observed. This observation could indicate a definite association of BV with preterm labor. The relative risk of the presence of the BV in preterm labor was found to be 2.60%. Also BV was associated with 2.6 fold increased risk for preterm labor at 21 – 25 years old age group. Cases with BV have basic vaginal pH and less number of *Lactobacillus sp.* Therefore, the screening for bacterial vaginosis as a routine during pregnancy and its prompt treatment may reduce the risk of preterm labour. Proper hygiene, early diagnosis of bacterial vaginosis and its prompt treatment may therefore reduce the risk of preterm labour and neonatal complications.

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