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Original Article

Obstetrics and Gynaecology Section

Urogenital Tract Infections in Preterm Labour and Preterm Premature Rupture of Membrane- An Observational Study

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ABSTRACT

Introduction: Preterm birth is the leading cause of neonatal morbidity and mortality. One of the major causes for Preterm Labour (PTL) and Premature Rupture of Membrane (PROM) is infection of urogenital tract.

Aim: To study the incidence of genitourinary infection in patients with preterm labour and preterm premature rupture of membrane.

Materials and Methods: A Prospective study was conducted at BLDE (DU) Shri BM Patil Medical College. We enrolled 100 pregnant women with preterm/preterm PROM in the study and evaluated for the genitourinary infection by doing urine culture, cervical swab culture, vaginal swab culture and examination of urine for pus cells. The participants were given appropriate obstetric care and followed till delivery.

Results: In the present study, study the incidence of genitourinary infection in preterm/preterm PROM was 59%. The cervical swab was positive in 33 participants, the vaginal swab was positive in 26 participants, the urine culture was positive in 19 participants, 35 participants had significant pus cells indicating urinary tract infection. A total of 59 participants had one or the other form of genitourinary infection. Out of the 100 participants enrolled in the study, 82 patients continued the pregnancy till full term.

Conclusion: Genitourinary infection is highly prevalent among patients of Preterm labour/preterm PROMs. There is a need for educating pregnant women regarding personal hygiene to prevent the genitourinary infections.

Keywords: Genital infections, Incidence, Pregnancy, Preterm birth

INTRODUCTION

PTL is defined as the onset of labour before 37 completed weeks of pregnancy and is a leading cause of neonatal morbidity and mortality worldwide. The rate of PTL in India at present is around 21%. India contributes 23.6% of preterm births of total global [1].

It is seen that the infection has important role in pathogenesis of preterm labour. The in vivo and in vivo studies shown the infection in the lower genital tract ascends up and lead to preterm labour [2]. The bacteria from lower genital tract after ascending up multiplies in decidua and placenta leading to recruitment of leukocytes which in turn lead to cytokine production triggering synthesis of prostaglandins [3]. These events brings following changes like the uterine contractions, cervical dilatation, exposure of membranes and microorganism entry into uterine cavity. The bacteria in the lower genital tract produces enzymes sialidase leading to the weakening of protective cervical mucus which in turn gives bacteria access to upper genital tract [4]. In cases of premature rupture of membranes, the pregnant woman and her foetus faces problems like maternal infection, umbilical cord compression and prolapse, preterm delivery low Apgar score, pulmonary hypoplasia, fetal deformation and low birth weight [5].

The birth of preterm infants is a social, emotional, physical and financial burden not only on the parents but to the society as well. Hence, the present study was conducted with an aim to study the incidence of genitourinary infection in patients with preterm labour and preterm premature rupture of membrane.

MATERIALS AND METHODS

A Prospective study was conducted from April to September 2016 at Department of Obstetrics and Gynecology (OBG), BLDE (Deemed to be university) Shri BM Patil medical college & RI. The institutional ethical committee clearance (159/2016-17)

was obtained. Informed consent of the participants was also taken. During the study period 1150 patients were screened and 100 patients fulfilled the criteria and hence included in the study. All women admitted to the labour ward of Department of OBG, with diagnosis of preterm labour and patients admitted with diagnosis of preterm premature rupture of membrane were included in the study according to NICE Guidelines [6]. The patients with induced PTL for obstetric and medical conditions like pregnancy induced hypertension, severe anaemia, epilepsy, multiple pregnancies, pregnancy with anomalous fetus, pregnancies with known uterine anomalies and fibroids were excluded from the study.

All the participants after informed consent were included in the study and subjected to:

i) Complete obstetric/medical history which includes the obstetric history, any previous history of preterm, any medical disorders like diabetes, thyroid disorders etc.,

ii) Clinical Examination which includes general physical examination, systemic examination like cardiovascular, obstetric examination which include perabdomen, perspeculum, pervaginal examination.

iii) Investigations-

- Complete blood count

- Urine for albumin, sugar, pus and epithelial cells

- Urine for microbial culture and sensitivity

- High vaginal and cervical swab for microbial culture and sensitivity and the appropriate obstetric and medical care was provided and were followed-up.

STATISTICAL ANALYSIS

Data were analysed using SPSS software v.23.0. For categorical data, the number and percentage were used. Chi-square (χ^2) test was used for association between two categorical variables.

RESULTS

The mean age of the participants was 23.82±1.5 years (Range 20-35 years). Majority of PROM/PTL cases were found in the age group 20-25 years [Table/Fig-1]. Among 100 participants 46 were primigravida and 54 were multigravida. Most of the participants presented in the late preterm gestational age [Table/Fig-2]. Among the participants, 73 and 27 presented with PTL and PROM respectively in which infection was seen in 39 and 20 cases, respectively [Table/Fig-3]. *Klebsiella pnemonia* and *Candida non-albicans* were the most common organisms isolated from Genitourinary Tract. The Cervical Swab Culture was positive for microorganisms in 33 participants [Table/Fig-4]. A total of 35 participants had significant pus cells in Urine indicating urinary tract infection. Among 100 participants the evidence of genito urinary infections was noted in 59 [Table/Fig-5]. Total infection cases were 59 but total swabs positive were 78. Out of 100, 82 patients continued the pregnancy till term and 18 had preterm delivery.

Age group (years)	PROM		PTL		p-value
	N	%	N	%	
20-25	10	50.0%	19	48.7%	0.739
25-30	4	20.0%	11	28.2%	
30-35	6	30.0%	9	23.1%	
Total	20	100.0%	39	100.0%	

[Table/Fig-1]: Distribution of PROM/PTL cases in which infection was found according to age group.
PROM- Premature rupture of membrane; PTL- Preterm Labour

Gestational age (weeks)	Frequency	Percent
28-30	23	23
30-32	18	18
32-34	16	16
34-36	43	43

[Table/Fig-2]: Distribution of PROM/PTL cases according to gestational age.

Cases	Number		Infection (+ve)		Infection (-ve)		p-value
	N	%	N	%	N	%	
PROM	27	27.0%	20	33.9%	7	17.1%	0.062
PTL	73	73.0%	39	66.1%	34	82.9%	
PROM+PTL	nil	-	nil	-	nil	-	
Total	100	100.0%	59	100.0%	41	100.0%	

[Table/Fig-3]: Distribution of PROM/PTL cases according to infection.

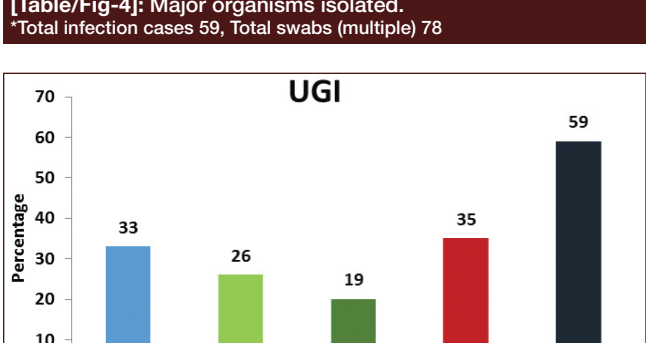
DISCUSSION

The mean age of study participants in our study was 23.82±1.5 years which was similar to the study done by Patel UM et al., [7] where 50 cases of PTL group were cases and term 50 as control were included and in each group mean age was 22.83 years and 23.82 years, respectively. Similarly in a study by Verma I et al., 80.77% were in the age range of 20-30 years [4]. In a study by Yarlagadda S et al., majority of the participants (32.7%) were less than 20 years which was less compared to present study [8].

In our study, 46 were primigravida and 54 were multigravida. In a similar study by Patel UM et al., 72% of the participants in PTL group were primigravida compared to 28% multigravida [7], whereas in a study by Verma I et al., 57.69% and 42.31% of participants were primigravida and multigravida, respectively [4].

Organisms	Total	%	Cervical swab		Vaginal swab		Urine culture	
			N	%	N	%	N	%
Candida non albicans	19	24.4%	8	24.2%	8	30.8%	3	15.8%
Klebsiella pneumonia	18	24.4%	3	9.1%	9	34.6%	6	31.6%
Candida albicans	8	10.3%	3	9.1%	4	15.4%	1	5.3%
Enterococcus species	2	2.6%	0	0.0%	0	0.0%	2	10.5%
E. coli	11	14.1%	1	3.0%	4	15.4%	6	31.6%
Others	20	24.4%	18	54.5%	1	3.8%	1	5.3%
Total*	78	100.0%	33	100.0%	26	100.0%	19	100.0%

[Table/Fig-4]: Major organisms isolated.
*Total infection cases 59, Total swabs (multiple) 78



[Table/Fig-5]: Distribution of Urogenital tract infections.

In our study, the evidence of genito urinary infections was noted in 59% of participants indicating high prevalence of pregnancy with genitourinary infection in the study area which was more when compared to studies by Patel UM et al., where genital tract infection was detected in 44% of cases [7], Bajwa S et al., which was 16%, and Bhalla P et al., was 30.93% [9,10]. In our study, *Klebsiella pnemonia* and *Candida non-albicans* were the most common organisms isolated from genitourinary tract which includes urinary tract, vagina, and cervix. In comparison, a study by Patel UM et al., [7] found *Gardnerella vaginalis* to be most common organism isolated in the subjects with genital tract infection, whereas E. coli was the most common organism isolated from urine samples of the PTL patients. Similar study by Vrishali G et al., observed E. coli as the most common organism isolated in patients of PTL with urinary infection [11]. Comparison of the present study findings with published studies is done in [Table/Fig-6] [4,7-11].

The study observed that treating the patients of PTL/preterm PROMs with appropriate antibiotics as per the culture sensitivity report can prolong the pregnancy till term in majority of the patients (82%). There are not many studies on this topic in this geographical area. The study will influence the policy makers to consider screening of genitourinary infections in pregnancy as routine. Large scale study with control arm and other parameters like drug sensitivity should also be studied in future studies.

Limitation(s)

It was a single arm study without control group. The sample size was small. Other parameters like drug sensitivity for organisms not have been studied.

CONCLUSION(S)

Genitourinary infection is highly prevalent among patients of Preterm labour/preterm PROMs. There is a need for educating pregnant women regarding personal hygiene and to prevent the genitourinary infections. Large scale community based studies are still needed to propose the universal screening of pregnant woman for genitourinary infection.

Study	Mean age (years)	Primigravida (%)	Multi gravida (%)	Incidence of GUI (%)	Most common organisms isolated
Present study	23.82.	46	54	59	*Klebsiella pneumoniae/Candida non-albicans*
Patel UM et al., [7]	22.83/23.82	72	28	44	*Gardnerella vaginalis/E. coli*
Verma I et al., [4]	20-30	57.69	42.31	--	--
Yarlagadda S et al., [8]	Less than 20	--	--	--	*Candida albicans*
Bajwa S et al., [9]	-	-	--	16	*Gardnerella vaginalis/E. coli*
Bhalla P et al., [10]	-	--	--	30.93	--
Vrishali G et al., [11]	-	--	--	34	*E. coli*

[Table/Fig-6]: Comparisons of various studies [4,7-11].

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