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Assessment of maternal and perinatal outcome in preterm labour associated with asymptomatic bacteriuria

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Abstract
Background: Asymptomatic bacteriuria is a bacterial infection of the urine without any of the typical symptoms that are associated with a urinary infection, and occurs in 2% to 15% of pregnancies. The present study was conducted to assess maternal and perinatal outcome in preterm labour associated with asymptomatic bacteriuria.
Materials and Methods: 104 preterm labor patients were divided in two groups as follows- group I patients with age nineteen years and above, who are <37 weeks period of gestation ending up in preterm labor not associated with bacteriuria. Group II patients with age nineteen years and above, undergoing preterm labor associated with bacteriuria. Parameters such as parity, BMI, comorbidity, preeclamptic toxaemia, preterm premature rupture of membrane, intrauterine growth restriction and low birth weight (LBW) was recorded.
Results: Parity was nulliparous in 15 and 17, multiparous in 32 and 28, grand multi in 5 and 7, BMI was obese in 34 and 26 and non- obese in 18 and 26 in group I and II respectively. Comorbidity was anaemia in 5 and 2, GDM in 7 and 2, hypertension in 3 and 1 and hypothyroidism in 8 and 2 in group I and II respectively. The difference was significant (p<0.05). Preeclamptic toxaemia was seen in 4 and 1, preterm premature rupture of membrane in 6, intrauterine growth restriction in 3 and 1 and low birth weight (LBW) in 8 and 2 in group I and group II, NICU admission was seen in 4 in group I and 1 in group II, perinatal deaths were recorded 5 in group I and 1 in group II respectively. The difference was significant (p<0.05).
Conclusion: Pre-eclamptic toxaemia, preterm premature rupture of membrane, intrauterine growth restriction and low birth weight (LBW), NICU admission and perinatal deaths was higher in pre- term labour patients with bacteriuria as compared to those without it.

Keywords: Pre- term, hypothyroidism, UTI

Introduction
UTI is the most common renal problem occurring in pregnancy. The urine of gravidas supports bacterial growth better than that of non- pregnant women because of its increased nutrient content. Profound physiologic and anatomic changes in the urinary tract during pregnancy contribute to the increased risk of infections such as ureteral dilation, stasis and occasional obstruction, would be expected to increase the susceptibility of pregnant women to UTI [1].
Asymptomatic bacteriuria is a bacterial infection of the urine without any of the typical symptoms that are associated with a urinary infection, and occurs in 2% to 15% of pregnancies. If left untreated, up to 30% of mothers will develop acute pyelonephritis [2]. Asymptomatic bacteriuria has been associated with low birth weight and preterm birth. Asymptomatic bacteriuria (ASB) is a common finding in many populations, including healthy women and persons with underlying urologic abnormalities. The 2005 guideline from the Infectious Diseases Society of America recommended that ASB should be screened for and treated only in pregnant women or in an individual prior to undergoing invasive urologic procedures [3].
The characterization and introduction of the quantitative urine culture in the 1950s first allowed the reliable recognition of asymptomatic bacteriuria [4]. The observations that a substantial proportion of patients with chronic pyelonephritis at autopsy had no history of symptomatic urinary infection, and the high frequency of pyelonephritis observed in pregnant women with untreated asymptomatic bacteriuria, supported a conclusion that asymptomatic bacteriuria was harmful [5]. The present study was conducted to assess maternal and perinatal outcome in preterm labour associated with asymptomatic bacteriuria.

Materials and Methods

This cross- sectional observational study comprised of 104 preterm labor patients associated with bacteriuria admitted at SAIMS. All gave their written consent for the participation in the study.

The inclusion criteria were gestational age <37 weeks and recurrent UTI in previous/present pregnancy. Of preterm labor and patients with h/o renal calculi.

Exclusion criteria was pregnant women with >37 weeks period of gestation, patients with previous history Data such as name, age, gender etc. was recorded. The patients were divided in two groups as follows- group I patients with age nineteen years and above, who are <37 weeks period of gestation ending up in preterm labor not associated with bacteriuria. Group II patients with age nineteen years and above, undergoing preterm labor associated with bacteriuria. Parameters such as parity, BMI, comorbidity, preeclamptic toxaemia, preterm premature rupture of membrane, intrauterine growth restriction and low birth weight (LBW) was recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table 1: Assessment of parameters

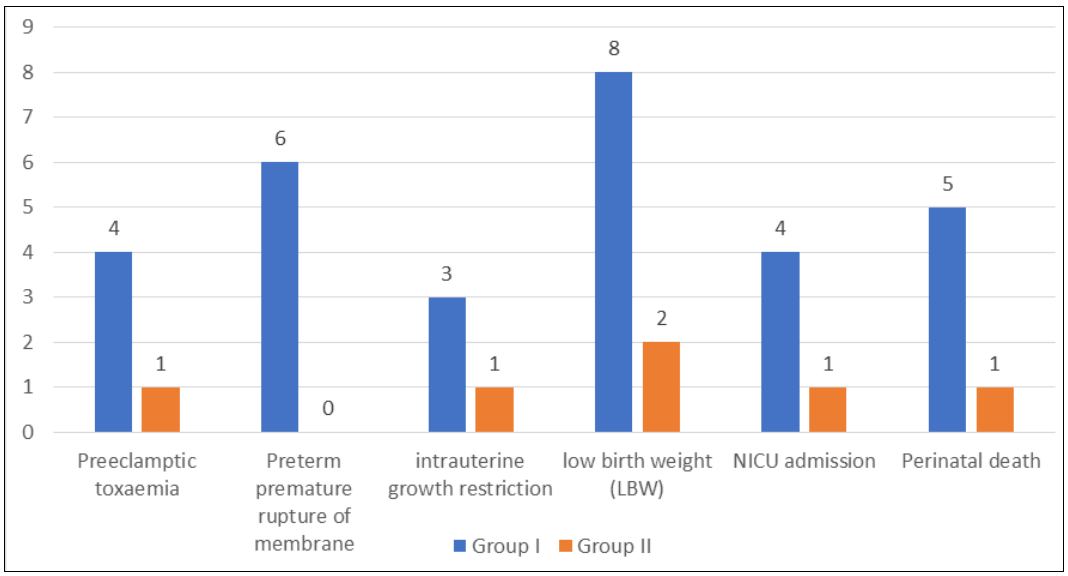
Parameters	Variables	Group I	Group II	P value
Parity	Nulliparous	15	17	0.05
	Multiparous	32	28	
	Grand multi	5	7	
BMI	Obese	34	26	0.02
	Non- obese	18	26	
Comorbidity	Anaemia	5	2	0.04
	GDM	7	2	
	Hypertension	3	1	
	Hypothyroidism	8	2	

Table 1 shows that parity was nulliparous in 15 and 17, multiparous in 32 and 28, grand multi in 5 and 7, BMI was obese in 34 and 26 and non- obese in 18 and 26 in group I and II respectively. Comorbidity was anaemia in 5 and 2, GDM in 7 and 2, hypertension in 3 and 1 and hypothyroidism in 8 and 2 in group I and II respectively. The difference was significant (p<0.05).

Table 2: Assessment of outcome

Parameters	Group I	Group II	P value
Preeclamptic toxaemia	4	1	0.05
Preterm premature rupture of membrane	6	0	0.01
intrauterine growth restriction	3	1	0.03
low birth weight (LBW)	8	2	0.02
NICU admission	4	1	0.01
Perinatal death	5	1	0.01

Table 2, graph 1 shows that preeclamptic toxaemia was seen in 4 and 1, preterm premature rupture of membrane in 6, intrauterine growth restriction in 3 and 1 and low birth weight (LBW) in 8 and 2 in group I and group II respectively. NICU admission was seen in 4 in group I and 1 in group II. Perinatal deaths were recorded 5 in group I and 1 in group II. The difference was significant (p<0.05).



Graph 1: Assessment of outcome

Discussion

During pregnancy many anatomical and physiological changes occur, which also affect the urinary tract [6]. Asymptomatic bacteriuria is reported to occur in 2-10% of pregnancies and *E. coli* causes 70-80% of them. Most infections are endogenous in origin [7]. Asymptomatic bacteriuria can have serious consequences for the foetus and/or mother. However, knowledge about the risk factors for carriage of resistant *E. coli* in the women of reproductive age group is lacking in general and especially from India [8]. Screening the commensal *E. coli* in antenatal women for antibiotic resistance pattern will provide guidelines for empiric therapy especially for sick new-borns. Molecular analysis of these isolates will provide prevalence of antibiotic resistant genes present in *E. coli* in the community [9].

E. coli forms part of the bacteria commensal flora of the human gut. It has been identified as the predominant reservoir of antibiotic resistance genes. Once acquired, these resistance genes are stable and are easily transferable to pathogenic bacteria [10]. The present study was conducted to assess maternal and perinatal outcome in preterm labour associated with asymptomatic bacteriuria.

We found that parity was nulliparous in 15 and 17, multiparous in 32 and 28, grand multi in 5 and 7, BMI was obese in 34 and 26 and non- obese in 18 and 26 in group I and II respectively. Comorbidity was anaemia in 5 and 2, GDM in 7 and 2, hypertension in 3 and 1 and hypothyroidism in 8 and 2 in group I and II respectively. Jain *et al*., [11] determined presence of asymptomatic bacteriuria (ASB) and obstetric outcome following treatment in early versus late pregnancy. ASB was found in 17 per cent pregnant women till 20 weeks and in 16 per cent between 32 to 34 weeks gestation. Increased incidence of preeclamptic toxaemia (PET) [RR 3.79, 95% CI 1.80-7.97], preterm premature rupture of membrane (PPROM)[RR 3.63, 45% CI 1.63-8.07], preterm labour (PTL) [RR 3.27, 95% CI 1.38-7.72], intrauterine growth restriction (IUGR)[RR 3.79, 95% CI 1.80-79], low birth weight (LBW) [RR1.37, 95% CI 0.71-2.61] was seen in late detected women (32-34 weeks) as compared to ASB negative women, whereas no significant difference was seen in early detected women (till 20 weeks) as compared to ASB negative women.

We found that preeclamptic toxaemia was seen in 4 and 1, preterm premature rupture of membrane in 6, intrauterine growth restriction in 3 and 1 and low birth weight (LBW) in 8 and 2 in group I and group II, NICU admission was seen in 4 in group I and 1 in group II. Perinatal deaths were recorded 5 in group I and 1 in group II respectively. Balachandran *et al*., [12] assessed any adverse maternal and perinatal morbidity related to UTI in pregnancy, focusing on identifying common uropathogens and their antibiotic sensitivity and resistance patterns. The study consisted of 549 women in the exposed group (i.e., those with at least one episode of UTI in pregnancy in 2018) and 329 in the comparison group (i.e., those without UTI). The study's primary outcome measures were preterm birth, recurrent UTI, pyelonephritis, and low birth weight (LBW). Women who had a UTI during pregnancy had more preterm deliveries than those without a UTI (c2=7.092; p=0.007). Recurrent UTI was observed in 26.6% of women with UTI, while the incidence of pyelonephritis was relatively low in this group (1.45%). There was no significant association between LBW and UTI in pregnancy (c2=0.097; p=0.756). The most common bacteria isolated from women with UTI were Group B Streptococcus (GBS, 31.3%), followed by Escherichia coli (30.9%). They were sensitive to a wide range of antibiotics. Several studies have shown *E. coli* and other Gram-negative isolates (namely the Klebsiella species, Acinetobacter baumannii, and Proteus mirabilis) to be responsible for 70% to 80% of UTI in pregnancy. Gram-positive organisms (e.g., Enterococcus faecalis and GBS) were isolated in approximately 10% of UTIs in pregnant women [13, 14].

The limitation the study is small sample size.

Conclusion

Authors found that preeclamptic toxaemia, preterm premature rupture of membrane, intrauterine growth restriction and low birth weight (LBW), NICU admission and perinatal deaths was higher in pre- term labour patients with bacteriuria as compared to those without it.

Conflict of Interest

Not available

Financial Support

Not available

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