

Original Article

ASYMPTOMATIC BACTERIURIA IN PREGNANCY AND ADVERSE MATERNAL & PREINATAL OUTCOME: A PROSPECTIVE STUDY

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ABSTRACT

Background: Asymptomatic bacteriuria (ASB) is associated with adverse maternal and perinatal outcome. Physiological changes in pregnancy increase the potentiality for the ASB. Undiagnosed and untreated ASB is a causative factor of abortion as well as preterm labour and premature rupture of membrane.

Methods: Every pregnant patient is routinely screened for asymptomatic bacteriuria to prevent adverse effect on pregnancy at early trimester.

Results: This study was conducted on total 250 outdoor patients from January, 2023 to July, 2023. Among them 25.2% were primi gravid patient, 47.2% cases were presented in 3rd trimester of pregnancy, 26% were pregestational diabetic patient and GDM was found in 33.6% cases. Anaemia was found in 54% cases. 35.2% cases presented with premature uterine contractions and among them 28.40% proceed to preterm labour.

Conclusion: Routine screening for asymptomatic bacteriuria is very much helpful to reduce adverse fetomaternal outcome.

Keywords: ASB, Pyelonephritis, Preterm Labour, Premature rupture of membrane (PROM), premature uterine contractions

INTRODUCTION

Asymptomatic bacteriuria (ASB) is the persistent bacterial colonization of the urinary tract without symptoms¹. Though it's a benign condition, it puts the pregnant women at increased risk for infections such as pyelonephritis². Asymptomatic bacteriuria is routinely screened in all women during pregnancy to reduce the risk of progression of two pyelonephritis¹. ASB also increase the risk of preterm labour and other complications². Incidence of asymptomatic bacteriuria during pregnancy has been reported to be 2–10% in the United States [1] and 2–5% in the United Kingdom [3]. In Australia, available estimates suggest that asymptomatic bacteriuria during pregnancy may be more common among Aboriginal and Torres Strait Islander women [4]. The prevalence of infection is most closely related to socioeconomic status and is similar in pregnant and non-pregnant women [5,6]. Other factors associated with an increased risk of bacteriuria include a history of recurrent urinary tract infections, diabetes and anatomical abnormalities of the urinary tract [7].

Asymptomatic bacteriuria in non-pregnant women is usually benign. But in pregnancy it increases the renal involvement (pyelonephritis), with an incidence of around 30% in affected women [6]. There is

association between untreated asymptomatic bacteriuria and low birth weight and preterm birth [8] if the infection progresses to pyelonephritis [9]. Routinely offer and recommend testing for asymptomatic bacteriuria early in pregnancy as treatment is effective and reduces the risk of pyelonephritis.

Midstream urine culture and sensitivity is considered the standard for diagnosis of asymptomatic bacteriuria in pregnancy. Dipstick urinalysis of nitrites may be useful for excluding asymptomatic bacteriuria but is not accurate for diagnosis [10]. A meta-analysis (Deville et al 2004) and a small number of RCTs Teppa & Roberts 2005, Karabulut 2007, Eigbefoh et al 2008, Mignini et al 2009 have shown high specificity (89–100%) but low sensitivity (33–98%), with a mid-range around 50%. There is no consensus in the literature about the optimal timing and testing frequency for asymptomatic bacteriuria. However, in a prospective study, a single urine specimen obtained between 12- and 16-weeks' gestation identified 80% of women who ultimately had asymptomatic bacteriuria [11].

MATERIALS AND METHOD

A prospective study was conducted in outpatient group at private hospital in Dhaka, Bangladesh during the period from January, 2023 to July, 2023. Total 250 patients of any age of reproductive age group were considered as study participants. There was a predesigned questionnaire for data collection from the respondents. In this study, the sociodemographic status and presence of diabetes in pregestational period was also taken into consideration. Diagnosis of asymptomatic bacteriuria was made under clinical testing of mid-stream urine routine examination under microscope and doing culture and sensitivity testing. Data was collected through direct interview of the pregnant patients of different age group.

RESULT

It was a prospective study and was conducted in private sector OPD patients in Dhaka, Bangladesh during the period from January, 2023 to July, 2023. In total 250 patients were recruited for this study who were presented with ASB in pregnancy. Out of 250 patients 35(14%) were within age group 15-20 years, 45(18%) were 21-25 years, 82(32.8%) were 26-30 years, 40(16%) were 31-35 years and 48(19.2%) were >35 years. Maximum 70(28%) patients had educational status of primary school level, 68(27.2%) patients were in higher secondary school passed people, 52(20.8%) patients were graduate and 30(12%) were postgraduate and 30(12%) belongs to illiterate group. Majority 95(38%) patients have family income <15000/month and only 40(16%) patients could earn >30000/month. Regarding occupational status 135(54%) patients were housewives, 58(23.2%) were day labourers, 33(13.2%) were service holder and only 24(9.6%) belongs to another occupational group (Table-1). Almost all 248(99.2%) patients were presented with increased frequency of micturition, 210(84%) had lower abdominal pain, 137(54.8%) had foul smelled micturition and only 38(15.2%) complaints of lower abdominal discomfort (Table-2). 57(22.8%), 75(30%) and 118(47.2%) pregnant patients presented at 1st, 2nd and 3rd trimester of pregnancy respectively (Table-3). 67(26.8%) cases suffered from ASB for a single episode in whole pregnancy, 88(35.2%) suffered from twice and 95(38%) from more than three times (Table-4). Among the pregnancy outcome in different age group and trimester we found abortion in 1st and 2nd trimester in 25(10%) and 32(12.8%) respectively. 63(25.2%) cases were primi gravid and 187(74.8%) were multigravid (Table 5). Among the predisposing factors anaemia 135(54%) was the most common factor than history of previous UTI in 105(42%), pregestational DM in 65(26%) and GDM in 84(33.6%) cases (Table 6). Most common causative organism is *E. coli* (34%), *S. aureus* (26.8%), *Enterococcus* (17.2%), *Klebsiella* (15.6%) (Table 7). 88(35.2%) patients developed premature contractions among them 25(28.40%) progresses to preterm labour. 105(42%) pregnant patients developed premature rupture of membrane (PROM) (Table 8). 45.59% (88) cases delivered out average sized baby and 24.35% (47), 16.58% (32), 13.47% (26) delivered out SGA fetus, LBW baby and IUGR baby respectively (Table 9).

Table 1: Sociodemographic characteristics of patients (n=250):

Sociodemographic characteristics	Frequency (n)	Percentage (%)
Age in years		
15-20 years	35	14%
21-25 years	45	18%
26-30 years	82	32.8%
31-35 years	40	16%
>35 years	48	19.2%
Educational status		
Illiterate	30	12%
Primary	70	28%
Secondary	68	27.2%
Graduate	52	20.8%
Postgraduate	30	12%
Monthly income in taka		
<15000tk/month	95	38%
15000-20000tk/month	48	19.2%
>20000tk/month	67	26.8%
>30000/month	40	16%
Occupational status		
Housewife	135	54%
Day labourers	58	23.2%
Service holder	33	13.2%
Others	24	9.6%

Table 2: Distribution of presenting symptoms of the patients:

Symptoms	Frequency (n=250)	Percentage (%)
Increased Frequency of micturition	248	99.2%
Lower abdominal discomfort	38	15.2%
Lower abdominal pain	210	84%
Foul smelling of urine	137	54.8%

Table 3: Duration of pregnancy:

Trimester	Frequency (n=250)	Percentage (%)
1 st trimester (upto 12 weeks)	57	22.8%
2 nd trimester (13weeks to 28weeks)	75	30%
3 rd trimester (29 weeks to 40weeks)	118	47.2%

Table 4: Occurance of ASB in pregnancy:

Total episodes of ASB in pregnancy	Frequency (n=250)	Percentage (%)
Single episode	67	26.8%
2 times	88	35.2%
>3 times	95	38%

Table 5: Number of pregnancies:

Number of pregnancy	Frequency (n=250)	Percentage (%)
Primi	63	25.2%
Multipara	187	74.8%

Table 6: Predisposing factors:

Predisposing factors	Frequency (n=250)	Percentage (%)
Anaemia	135	54%
History of previous UTI	105	42%
Pregestational DM	65	26%
GDM	84	33.6%

Table 7: Causative organism:

Causative organism	Frequency (n=250)	Percentage (%)
E. coli	85	34%
S. aureus	67	26.8%
Enterococcus	43	17.2%
Klebsiella	39	15.6%
Others	16	6.4%

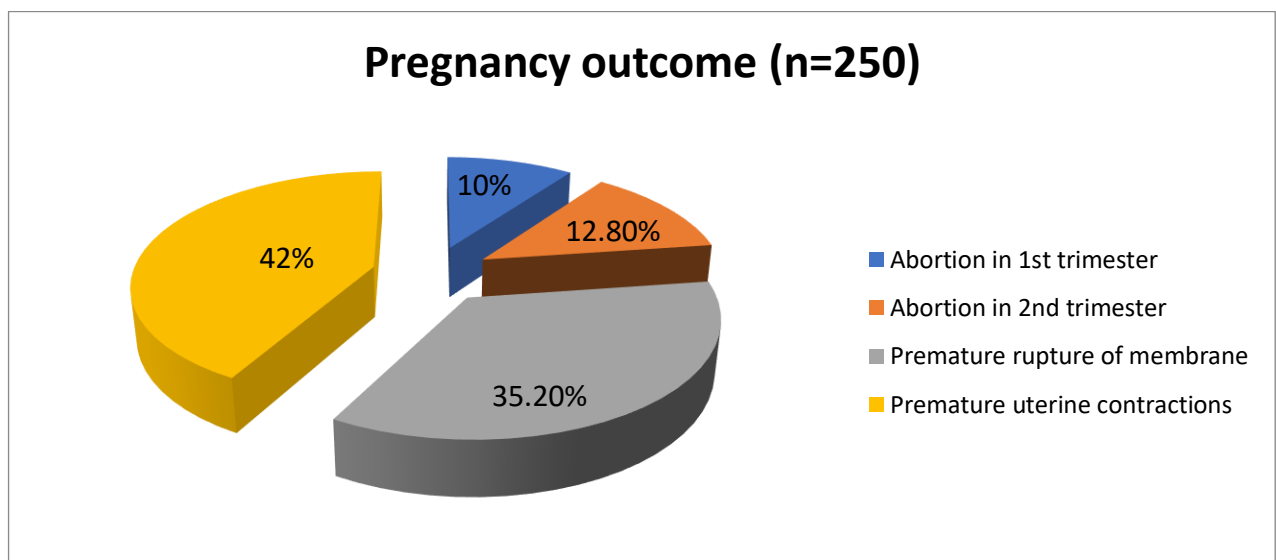
Table 8: Pregnancy outcome:

Pregnancy outcome	Frequency	Percentage (%)
Abortion in 1st trimester	25 (n=250)	10%
Abortion in 2 nd trimester	32 (n=250)	12.8%
Premature contraction	88 (n=250)	35.2%
Premature rupture of membrane	105 (n=250)	42%
Preterm labour	25 (n=88)	28.40%

Table 9: Fetal outcome:

Fetal outcome	Frequency (n=193)	Percentage (%)
Average baby weight (2.5kg)	88	45.59%
LBW baby (<2.5kg)	32	16.58%
IUGR	26	13.47%
SGA fetus	47	24.35%

Pie chart 1: Pregnancy outcome (n=250)



DISCUSSION:

UTI is a globally prevalent disease with higher incidence in pregnant females, owing to decreased immunity and various physiological effects of increased progesterone levels [19]. This study was conducted in private hospital sectors among 250 pregnant patients who visited the hospital with the features of ASB in pregnancy. Some of them visited for several episodes of attack. This study was conducted from January, 2023 to July, 2023 with the aim to treat ASB in pregnancy at different age group and to identify and prevent the adverse maternal and perinatal outcome. During this study we found pregnant patients of any trimester can be affected by ASB in pregnancy for several times. The rate of ASB was found 2.1%, 2.1% and 3.2% in the first, second and third trimesters respectively in a study [12] and in our study we find ASB affects the pregnancy more in 3rd trimester 118(47.2%) rather than in 1st 57(22.8%) and 2nd trimester respectively 75(30%).

In our study we found mostly 187(74.8%) multigravid patients were prone to suffer from ASB in pregnancy rather than primi gravida patients, 63(25.2%). In other study it's also reflected that multigravida patients suffer from ASB in pregnancy more than primi patients [13], Among the predisposing factors anaemia 135(54%) was the most common factor than history of previous UTI in 105(42%), pregestational DM in 65(26%) and GDM in 84(33.6%) cases. Similarly, was found in a study conducted on ASB in pregnancy where there was a significant finding of previous history of UTI (22.9%) and anemia (58.3%) associated with ASB in pregnant females [13]. In this study most common causative organism was found *Escherichia coli* (85%), *S. Aureus* (67%), *Enterococcus* (39), *Klebsiella* (16%) cases respectively. Similarly other study also found *Escherichia coli* (39.2%) was the most common microorganism isolated followed by *Staphylococcus aureus* (34.3%), *Enterococcus faecalis* (14.7%), *Klebsiella* (4.9%), coagulase-negative *Staphylococcus* spp. (2.9%), and *Citrobacter* and *Acinetobacter* (1.9%) [13]. The most common microorganism causing ASB is *Escherichia coli* (80%–85%). [14–18]. Other microorganisms causing ASB are *Klebsiella*, *Proteus*, *Staphylococcus aureus*, coagulase-negative *Staphylococcus* (CoNS), and *Pseudomonas* spp.

Urine culture is considered the gold standard test identification of ASB in pregnant females. [15,18] It should be done early in pregnancy since ASB can occur as early as the 6th week of gestation and peaks around 22nd –24th weeks. [21,22,23]. ASB occurs without any apparent symptoms of UTI, so it becomes important to detect any undiagnosed bacterial infection present in the urinary tract during pregnancy as it can progress to symptomatic bacteriuria, which further leads to maternal and fetal complications such as pyelonephritis, spontaneous abortion, anemia, preeclamptic toxemia, postpartum endometritis, maternal and neonatal sepsis, low birth weight (LBW), intrauterine growth retardation, premature preterm rupture of membrane, preterm labor, and higher fetal mortality rates.[14,21,16, 18,20]. In our study 57(22.8%), 75(30%) and 118(47.2%) pregnant patients presented in 1st, 2nd and 3rd trimester of pregnancy respectively. Among them 54% (135) had varying degrees of anaemia, 42% (105) cases had history of recurrent UTI. 33.6% (84) cases had GDM and 26% (65) patients were suffering from pregestational DM. 10% (25) and 12.8% (32) presented cases were aborted in 1st trimester and 2nd trimester respectively. 42% (105) pregnancies were complicated with premature rupture of membrane and 35.2% (88) cases developed premature contractions. Among the premature contraction group 28.40% (25) had developed preterm labour. Except the abortion group 45.59% (88) patients had delivered baby with average body weight, 24.35% (47) were small for gestational age (SGA) babies, LBW was found in 16.58% (32) cases and IUGR was associated with 13.47% (26) cases. Among the presented cases 26.8% (67) patients reported with single episode of UTI attack and max 38% (95) cases presented with recurrent attack of UTI. All the cases were treated as OPD basis and Nitrofurantoin was the drug of choice for most of the patients.

According to a study by the WHO for global burden of disease, LBW and perinatal causes are the leading causes of death and disability. Therefore, it is always better to screen and treat ASB during antenatal period to avoid further complications [17] It will be the cost-effective interventions at primary healthcare for safe motherhood and newborn care in developing countries.[20]

LIMITATIONS OF THE STUDY

This study was conducted in private sector. So, the result might not reflect the scenario of the whole country.

CONCLUSION

It was emphasized that urine culture should be done in early antenatal visit as routine screening to identify ASB in pregnant females as it can prevent fetal and maternal complications. The clinicians should play a pivotal role to improve ANC follow up.

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