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Prevalence of asymptomatic bacteriuria among pregnant women attending a tertiary care centre

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Abstract
Background: Asymptomatic bacteriuria characterised by presence of 10^5 or more colony forming bacteria per ml of urine in a person without any clinical finding. Different researches have reported the prevalence of asymptomatic bacteriuria in pregnancy to range from 2-11%. Untreated asymptomatic bacteriuria can lead to adverse maternal complications like pyelonephritis, cystitis, hypertension, preeclampsia, anaemia and preterm labour; and foetal complications like IUGR, prematurity, low birth weight and even death. Hence it's study is very essential to reduce the complication and to improve feto-maternal outcome.
Aims and objectives: To find out the prevalence of asymptomatic bacteriuria among the pregnant women attending a tertiary health care centre.
Materials and Methods: This hospital based "cross-sectional" study was carried out in the department of Obstetrics and Gynaecology and in the department of Microbiology of Midnapore Medical College and Hospital in West Bengal for a duration of one year (1st October 2022 to 30th September 2023). Total 125 pregnant women were considered for the study after fulfilling the eligibility criteria. A data collection tool was used to gather various pieces of information. All data were collected and summarized in tables and figures. Statistical analyses were performed using the Statistical Package for the Social Science (SPSS). Patients were studied for the following out comes: without complications or with complication like, Pyelonephritis, PPH, Low birth weight, IUGR, PROM, IUFD and Foetal distress.
Results: This study investigated asymptomatic bacteriuria (ASB) in 125 pregnant women, finding a prevalence of 10.4%. The majority of patients (69) were aged 20-29, with the highest ASB rate (46%) in this age group. Lower socioeconomic status, rural residence, and education below secondary level were associated with higher ASB rates. Escherichia coli (76.9%) and Klebsiella (15.38%) were the most common causative organisms, with 70% sensitivity to ampicillin. ASB was associated with anaemia (38.4%), proteinuria (46.15%), pyuria, pre-eclampsia, preterm deliveries, low-birth-weight infants, and IUGR infants. Antibiotic treatment was effective, but the difference in operative deliveries between bacteriuria and non-bacteriuria groups was not statistically significant.
Conclusion: Asymptomatic Bacteriuria (ASB) is a common bacterial infection affecting 10.4% of pregnancies. If left untreated, ASB can lead to severe maternal and fetal complications. Risk factors include first-time pregnancy, UTI history, anaemia, and high BMI. Early detection and treatment with antibiotics are crucial to prevent adverse outcomes. Screening is recommended before conception or in the first trimester.

Keywords: Asymptomatic bacteriuria, *E. coli*, Antibiotic sensitivity, maternal complications, Pre-term delivery.

Introduction

During pregnancy, urinary tract infections are frequently encountered as one of the most common infections [1]. It can either present with symptoms or it can be asymptomatic. Asymptomatic bacteriuria characterised by presence of 10^5 or more colony forming bacteria per ml of urine in a person without any clinical findings [2].

Different researches have reported the prevalence of asymptomatic bacteriuria in pregnancy to range from 2-11% [3, 4].

Urine normally present in bladder is sterile due to acidic pH, high urine osmolality and high urea levels inhibiting growth of bacteria [5]. In pregnancy, there are many physiological and morphological changes that predisposes to asymptomatic bacteriuria.

The development of urinary tract infections is contributed by a combination of factors including reduction in immunity, urinary stasis, shortening of urethra, development of glycosuria and urine

reflux from bladder into ureter [6, 7]. The typical presentations of UTIs in pregnancy are asymptomatic bacteriuria, acute cystitis and acute pyelonephritis [8]. Various factors such as presence of adhesions, stasis produced by the gravid uterus contribute to the causation of UTI [9].

Untreated asymptomatic bacteriuria can lead to adverse maternal and foetal outcomes. Maternal complications include pyelonephritis, cystitis, hypertension, preeclampsia, anaemia and preterm labour; while foetal complications include IUGR, prematurity, low birth weight and even death [3, 10, 11].

The diagnosis of asymptomatic bacteriuria typically made when 10^5 or more bacteria per ml of urine are isolated from a urine sample; urine culture is considered as most suitable method for its detection. Dipstick method can be used may indicate the presence or absence of bacteriuria but the sensitivity of dipstick for nitrites and leucocyte esterase has been found to be quite low [4, 10].

Adverse outcomes of undiagnosed asymptomatic bacteriuria in mother and foetus have made researchers to recommend urine culture as a part of routine investigations in all pregnant women reporting for antenatal checkup to prevent any form of complication timely [6].

Hence this study is very essential to reduce the complication and to improve feto-maternal outcome.

Aims and objectives

1. To find out the prevalence of asymptomatic bacteriuria among the pregnant women attending the tertiary health care centre.
2. To know the association of bacteriuria with age, parity and socioeconomic status.
3. To find out the commonest pathogen causing ASB in pregnancy.

Materials and methods

Study design: It was a hospital based "cross-sectional" study

Study Setting and Timelines: This was a 12 months study carried out in the department of Obstetrics and Gynaecology and in the department of Microbiology of a tertiary care hospital in West Bengal.

Place of the Study: The study was carried out in the Department of Obstetrics and Gynaecology and in the Department of Microbiology of Midnapore Medical College and Hospital.

Period of the study: One Year (1st October 2022 to 30 September 2023).

Study Population: Pregnant women attending the antenatal OPD (ANC) without any sign and symptom of UTI or a routine microscopic urine report shows evidence of UTI. Total 125 pregnant women were considered for the study.

Sample size: Sample size calculated as 125 pregnant women.

Case control required or not: Not required.

Inclusion Criteria

1. Pregnant women with evidence of UTI either dipstick or microscopic or culture positive but without UTI symptoms.
2. All categories of pregnant women willing to participate.
3. Patient planning to get delivered at our hospital.

Exclusion Criteria

1. Pregnant women taking antibiotics within the last 3 weeks.
2. Pregnant women with symptoms of UTI such as frequency, urgency, dysuria and supra pubic pain.
3. During the study women who will found to have multiple pregnancy, placenta praevia, congenital anomalies.
4. H/O fever.
5. H/O preterm delivery, PROM.
6. H/O renal stone and renal disease.
7. H/O urolithiasis
8. Unwilling patient.
9. Not giving consent.

Study Tools: Data collection proforma, urine culture reports.

Data Collection and Interpretation: A data collection tool was used to gather various pieces of information. Complete history was taken including history of previous pregnancy. Complication of mothers during antenatal period like hypertension, vaginal discharge etc were also recorded. Investigations like complete blood count with haemoglobin levels, sugar, urea, creatinine levels, liver function test, serology reports like HIV, HBsAg, Anti-HCV; ECG, chest-x ray, USG lower abdomen & pelvis with KUB were done. Urine microscopic, culture and biochemical examination for determination of number and type of bacteria in the urine was an extremely important diagnostic procedure in our study. CLED media was used for urine culture. All data were collected and summarized in tables and figures.

Statistical Analysis Plan: All values were expressed as mean ± standard deviation (SD). Results were analysed by unpaired Student's t-test for parametric data when two groups were compared. Fisher's exact test and Chi-square test were used for categorical data as appropriate. A p-value < 0.05 was considered statistically significant. Statistical analyses were performed using the Statistical Package for the Social Science (SPSS).

Outcome Definition and Parameters: Patients were studied for the following out comes: Without complications or with complication like, Pyelonephritis, PPH, Low birth weight, IUGR, PROM, IUFD and Foetal distress.

Ethical Clearance: Prior to commencing the study, the necessary ethical approval was obtained from the "Institutional Ethics Committee", ensuring adherence to strict ethical standards. The privacy and confidentiality of all patients were meticulously maintained throughout the research process. Furthermore, each patient received care and attention in accordance with established hospital protocols, guaranteeing their safety and well-being.

Results

This hospital based "cross-sectional" study included 125 pregnant women. Results of our study has been discussed below.

Table 1: Distribution of asymptomatic bacteriuria

Description	No of cases	Percentage
Significant bacteriuria	13	10.4%
Without bacteriuria	112	89.6%
Total	125	100%

Out of 125 cases, 13 (10.4%) cases had significant bacteriuria and 112 (89.6%) cases had no significant bacteriuria. So, the prevalence of asymptomatic bacteriuria was 10.4%.

Table 2: Age related distribution

Age in years	Non-Bacteriuria	Percentage (%)	Bacteriuria	Percentage (%)
< 20	26	23.21%	5	38.4%
20-29	63	56.25%	6	46.1%
30-39	23	20.53%	2	15.3%
Total	112	100%	13	100%

P value: 0.481, Statistically significant (p<0.05): No,
Chi-square value 1.462

According to the above table maximum number of patients belongs to the age group 20-29 i.e., 69 patients, highest percentage of significant bacteriuria 46% was identified in the same age group. Lowest percentage 15.3% of positive cases were seen in age group 30-39.

Table 3: Socioeconomic status

Group	Non-Bacteriuria	Percentage	Bacteriuria	Percentage
Group 3 &4	35	31.25%	3	23.07%
Group 5	77	68.75%	10	76.92%
Total	112	100%	13	100%

P value: 0.544, Statistically significant (p<0.05): No,
Chi-square value 0.3677

There is high prevalence of asymptomatic bacteriuria among lower socio-economic status due to lack of knowledge, poor personal hygiene and low literacy but not statistically significant. Above table shows the distribution of ASB patients according to the socioeconomic status. The percentage of asymptomatic bacteriuria were high among the lower socioeconomic status.

Table 4: Residential Status

Group	Non-Bacteriuria	Percentage	Bacteriuria	Percentage
Rural	78	69.64%	10	76.92%
Urban	34	30.35%	3	23.07%
Total	112	100%	13	100%

P value:0.586, Chi-square value: 0.296,
Statistically Significant: No.

According to above table maximum number of patients belongs to rural area and maximum number of asymptomatic bacteriuria patients are from rural area (76.92%). The value is statistically not significant.

Table 5: Educational Status

Group	Non-Bacteriuria	Percentage	Bacteriuria	Percentage
<Secondary	75	66.96%	11	84.61%
≥Secondary	37	33.03%	2	15.38%
Total	112	100%	13	100%

P value: 0.193, Chi-square value 1.691,
Statistically Significant: No.

According to above table maximum number of patients with asymptomatic bacteriuria had education below secondary level. The difference is statistically not significant.

Table 6: Distribution of patients according to Obstetrics Status

Group	Non-Bacteriuria	Percentage (%)	Bacteriuria	Percentage (%)
Primigravida	62	55.35%	10	76.92%
2nd Gravida	26	23.21%	2	15.38%
Multigravida	24	21.42%	1	7.7%
Total	112	100%	13	100%

P value: 0.307, Chi-square value: 2.358,
Statistically significant (p<0.05): No.

Above table shows the distribution of the patient in relation obstetrics status. Highest number of ASB patients were seen in primigravida (76.92%) but it is statistically insignificant.

Table 7: Distribution of patient according to the period of gestation

Group	Non-Bacteriuria	Percentage (%)	Bacteriuria	Percentage (%)
12 weeks	15	13.39%	2	15.38%
13 weeks	17	15.17%	1	7.7%
14 weeks	37	33.03%	5	38.46%
15 weeks	25	22.32%	5	38.46%
16 weeks	18	16.07%	0	0
Total	112	100%	13	100%

P value: 0.413, Chi-square value: 3.943,
Statistically significant (p<0.05): No.

Above table shows the distribution of ASB patients according to period of gestation. High percentage of ASB seen in 2nd trimester in contrast to 1st trimester but the result is statistically not significant.

Table 8: Distribution of Causative Organisms

Sl. No	Organisms	No. of cases	Percentage (%)
1	E. coli	10	76.9%
2	Klebsiella	2	15.38%
3	Staph. Aureus	1	7.69%

The most common causative organism is Escherichia coli accounting for 76.9% of cases. Followed by Klebsiella accounting for 15.38% cases. The organisms are usually gram-negative enteric bacilli. These are collectively called as uropathogens.

Table 9: Antibiogram

Antibiotics	E. coli	Klebsiella	Staph. Aureus
Amoxicillin	4(40%)	-	-
Amoxicillin-Clavulanic acid	8(80%)	2(100%)	1(100%)
Ceftazidime	5(50%)	1(50%)	-
Cefotaxime	6(60%)	1(50%)	1(100%)
Ceftriaxone	9(90%)	2(100%)	1(100%)
Norfloxacin	10(100%)	2(100%)	1(100%)
Ampicillin	7(70%)	1(50%)	-
Piperacillin/Tazobactam	10(100%)	2(100%)	1(100%)
Imipenem	10(100%)	2(100%)	1(100%)
Nitrofurantoin	8(80%)	2(100%)	1(100%)

Historically ampicillin has been the drug of choice but in recent years *E. coli* has acquired resistance to ampicillin. In this study there is 70% sensitivity of *E. coli* to ampicillin. Alternatively, the cephalosporins are well tolerated and adequately eradicate the common organisms.

Table 10: Distribution of patients according to Anaemia

Group	Non-Bacteriuria	Percentage (%)	Bacteriuria	Percentage (%)
Less than 10gm%	34	30.3%	5	38.4%
More than 10gm%	78	69.6%	8	61.5%
Total	112	100%	13	100%

P value: 0.550, Chi-square value: 0.356,
Statistically significant (p<0.05): No.

The incidence of anaemia among bacteriuria group is 38.4% and in non-bacteriuria group is 30.3%. The difference is not significant.

Table 11: Urine Nitrate Dipstick test

Group	Non-Bacteriuria	Percentage	Bacteriuria	Percentage
Nitrates Present	2	1.8%	10	76.9%
Nitrates Absent	110	98.2%	3	23.1%
Total	112	100%	13	100%

P value: <0.001, Chi-square value: 75.77,
*Statistically significant (p<0.05): Yes.

The sensitivity of urine nitrate test is 76.9% and statistically significant. But it is not an useful initial test in bacteriuria patient due to low sensitivity.

Table 12: Proteinuria status

Group	Non-Bacteriuria	Percentage	Bacteriuria	Percentage
Albumin Present	10	8.9%	6	46.15%
Albumin Absent	102	91.1%	7	53.85%
Total	112	100%	13	100%

P value: <0.001, Chi-square value: 14.46,
*Statistically Significant (p<0.05): Yes.

Proteinuria is increased during pregnancy and levels up to 300mg/dl is considered as normal. It is increased in UTI because of release of leucocytes from bacteria. Leucocytes excretion is increased in bacteriuria. Proteinuria is statistically significant parameter in bacterurias.

Table 13: Pyuria among the study population

Group	Non-Bacteriuria	Percentage	Bacteriuria	Percentage
Pus cells Present	4	3.5%	8	61.5%
Pus cells Absent	108	96.5%	5	38.5%
Total	112	100%	13	100%

P value: <0.001, Chi-square value: 45.10,
* Statistically significant (p<0.05): Yes.

Pyuria is a statistically significant parameter among bacteriuria patient.

Table 14: Pre-eclampsia status

Group	Non-Bacteriuria	Percentage	Bacteriuria	Percentage
Pre-eclampsia present	8	7.14%	2	15.38%
Pre-eclampsia absent	104	92.8%	11	84.61%
Total	112	100%	13	100%

P value: 0.299, Chi-square value: 1.075,
Statistically significant (p<0.05): No.

The occurrence of pre-eclampsia is more among bacteriuria patients than in non-bacteriuria patients. The difference is not significant statistically.

Table 15: Foetal outcome

Group	Non-Bacteriuria	Percentage	Bacteriuria	Percentage
Term	100	89.28%	10	76.92%
34-37 weeks	9	8.03%	2	15.38%
Less than 34 weeks	3	2.67%	1	7.7%
Total	112	100%	13	100%

P value: 0.409, Chi-square value: 1.832,
Statistically significant (p<0.05): No.

There was one case of preterm delivery in the bacteriuria pregnant women below 34 weeks. Two cases of preterm deliveries were between 34 to 37 weeks of gestation and 10 cases of term deliveries among bacteriuria patients. The difference is statistically not significant.

Table 16: Mode of Delivery

Group	Non-Bacteriuria	Percentage	Bacteriuria	Percentage
LSCS	27	24.1%	4	30.7%
Vaginal Delivery	85	75.9%	9	69.3%
Total	112	100%	13	100%

P value: 0.598, Chi-square value: 0.277,
Statistically significant (p<0.05): No

The difference in the number of operative deliveries in bacteriuria treated with antibiotics and non-bacteriuria is not statistically not significant.

Table 17: Birth weight of baby

Group	Non-Bacteriuria	Percentage	Bacteriuria	Percentage
Less than 2.5 kg	13	11.6%	4	30.7%
More than 2.5 kg	99	88.4%	9	69.3%
Total	112	100%	13	100%

P value: 0.0564, Chi-square value: 3.640,
Statistically significant (p<0.05): No.

The occurrence of low-birth-weight infants is more among bacteriuria women treated with antibiotic. The difference of low-birth-weight infants among the two group is not significant statistically.

Table 18: IUGR status

Group	Non-Bacteriuria	Percentage	Bacteriuria	Percentage
IUGR present	4	3.5%	1	7.7%
IUGR absent	108	96.5%	12	92.3%
Total	112	100%	13	100%

P value: 0.472, Chi-square value: 0.515,
Statistically significant (p<0.05): No.

The occurrence of IUGR infants is to be high among bacteriuria mother than in non-bacteriuria mother. The difference is statistically not significant.

Discussion

125 antenatal women attending the outpatient department at Midnapore Medical College and Hospital during October 2022 to September 2023 were screened at 12 - 16 weeks of gestation & taken for statistical analysis. The prevalence of asymptomatic bacteriuria among this population was 10.4 % [Table-1]**.** In our study, maximum number of patients belonged to the age group 20-29 i.e, 69 patients, highest percentage of significant bacteriuria, 46% was identified in the same age group. Lowest percentage 15.3% of positive cases were seen in age group 30-39 [Table-2]. The percentage of asymptomatic bacteriuria were high among the lower socioeconomic status [Table-3]. Maximum number of patients were from rural area and maximum number of asymptomatic bacteriuria patients were from rural area (76.92%) [Table-4]. In our study. maximum number of patients with asymptomatic bacteriuria had education below secondary level [Table-5]. Table-6 showed the distribution of the patient in relation obstetrics status. Highest number of ASB patients were seen in primigravida (76.92%) but it is statistically insignificant. High percentage of ASB seen in 2nd trimester in contrast to 1st trimester [Table-7]. The most common causative organism was Escherichia coli accounting for 76.9% of cases followed by Klebsiella accounting for 15.38% cases [Table-8]. In this study there was 70% sensitivity of *E. coli* to ampicillin. Alternatively, the cephalosporins were well tolerated and adequately eradicate the common organisms [Table-9]. The incidence of anaemia among bacteriuria group is 38.4% and in non-bacteriuria group is 30.3% [Table-10]. The sensitivity of urine nitrate test is 76.9% and statistically significant. But it is not an useful initial test in bacteriuria patient due to low sensitivity [Table-11].In our study, proteinuria was present in 46.15% asymptomatic bacteriuria cases [Table-12] and pyuria was a statistically significant parameter among bacteriuria patient [Table-13]. The occurrence of pre-eclampsia was more among bacteriuria patients than in non-bacteriuria patients [Table-14]. There was one case of preterm delivery in the bacteriuria pregnant women below 34 weeks. Two cases of preterm deliveries were between 34 to 37 weeks of gestation and 10 cases of term deliveries among bacteriuria patients[table-15].In our study, the difference in the number of operative deliveries in bacteriuria treated with antibiotics and non-bacteriuria is not statistically not significant [Table-16]. The occurrence of low-birth-weight infants was more among bacteriuria women treated with antibiotic [Table-17]. The occurrence of IUGR infants was to be high among bacteriuria mother than in non-bacteriuria mother [Table-18].

Incidence and Prevalence: The incidence of bacteriuria during pregnancy varies from 2- 7% depending on age, parity, race and socioeconomic status (Williams 2002). In this study the prevalence is 10.4% which may be related to low socioeconomic status. Different researches have reported the prevalence of asymptomatic bacteriuria in pregnancy to range from 2-11% **[3, 4]**.

Age and Parity

Most of the women in this study belonged to 20 to 29 years of age group. Youngest among the study was 16 years of age & oldest was 35 years of age. It was more common among primigravida (76.92%). Several factors may contribute to this phenomenon, including low socioeconomic status, heightened sexual activity, inadequate personal hygiene habits, and delayed urination after sexual intercourse. This study correlate with study made by Talukdar B *et al*. [12] and Mukherjee K *et al.* [13]

Socio-economic status:

The percentage of asymptomatic bacteriuria were high among the lower socioeconomic status (76.92%). ABU during pregnancy is more common in women in low socioeconomic status (Williams 2003) **(14).** A Cochrane Database Systematic review has shown that asymptomatic bacteriuria may be marker for low socioeconomic status, which is associated with low birth weight. This study correlates with these findings in that the incidence in low socioeconomic groups is 76.92% which reflects the importance of literacy, health awareness and personal hygiene in the prevention of UTIs.

Residential status

In our study maximum women belongs to rural area; therefore, maximum no of ASB were found mostly in this group compared to urban population but the difference was not significant.
Similar finding was seen in study made by Goruntla N *et al*. [15]. In contrast to our study Talukdar B *et al*. [12] observed high prevalence of ASB among rural population and the difference is statistically significant.

Education

In this study majority of women had education below secondary education. In bacteriurics 85% women had below secondary education and 15% women had secondary education or more. So, the prevalence of ASB was high among illiterate and low education level.

This study correlate with study done by Farazi A *et al*. [16]

Period of gestation

In the present study maximum number of patients with asymptomatic bacteriuria were gestational age between 14 to 15 weeks followed by 15% cases of asymptomatic bacteriuria seen in women with gestational age 12 weeks. A similar finding was found in a study by Agarwal A *et al*.(2021) [17] where ASB was high in second trimester compared to third and first trimester. This study also correlates with study made by Mukherjee K *et al* (2017) [13]. In contrast to our study Yadav K *et al* (2019)[18] observed high prevalence of ASB in third trimester and Patel P *et al* 2022 [19] observed high prevalence of ASB in first trimester.Thus, the analysis of POG Profile in ASB in pregnant women from Midnapore town and surrounding area shows ASB to be more prevalent in early second trimester.

Anaemia

In the present study it was found that anaemia was present in 30% cases in non-bacteriuria group and 38% cases in bacteriuria group. P value is more than 0.05 and the difference is statistically insignificant. Higher haemoglobin level is less likely associated with ASB compared to less haemoglobin level. A similar finding was found in a study by Sonkar N *et al* (2021) [20] observed that higher haemoglobin level was less likely to ASB (AOR = 0.42, 95% confidence interval: 0.202-0.88, $p = 0.021$).

Proteinuria and Pyuria

Proteinuria tends to rise during UTI due to the discharge of proteins from leukocytes, yet it lacks both sensitivity and specificity. Pyuria, which is characterized by more than 5-7 pus cells per high-power field in pregnant women, typically signifies urinary tract infection rather than colonization.In our study Proteinuria was present in 9% non-bacteriuria patients and 46% bacteriuria patients. And pyuria was present in3.5% non-bacteriuria patients and 61% bacteriuria patients. Therefore, cannot be solely relied upon in diagnosing ASB. Similar result was found in a study by Connolly AM *et al*. [21]

Urinary Nitrate Dipstick Test

A prospective study conducted at Liverpool Women's Hospital in 1998 to assess the effectiveness of reagent strips in detecting asymptomatic bacteriuria (ABU) in early pregnancy concluded that urine dipstick tests lack the necessary sensitivity for screening purposes, potentially resulting in the oversight of many patients **[22]**. A Cochrane Database Systematic Review 2000 recommends formal bacteriological culture as the gold standard for screening for ABU. In our study nitrate dipstick test ware positive in 10 patients with bacteriuria and 3 patients with bacteriuria were nitrate dipstick test negative. Sensitivity was 77%. If this test alone was used for screening more than one third of cases would have been missed. So, nitrite test cannot be used as a diagnostic test but could be used as an initial test to screen ASB.

ASB and Pre-eclampsia

UTI during pregnancy was associated with hypertension. But this study did not prove cause and effect relationship. Several others have attempted to relate asymptomatic bacteriuria to development of hypertensive disorders, but the results have been unclear {Reddy M *et al* [9]. In this study 2 patients with bacteriuria developed pre-eclampsia and 8 patients with non-bacteriuria developed pre-eclampsia. P value is 0.299. The difference is statistically insignificant.

Causative Organism: In our study *E. coli* is the most common organism, accounting for 77.5% cases and *Klebsiell*a accounting for 15% cases and *Staph. Aureus* 7.5% cases. Studies from Talukdar B *et al*. [12], Mukherjee K *et al*. [13], Goruntla N *et al*. [15], Farazi A *et al*. [16], Agarwal A *et al*. [17], Yadav K *et al*. [18], Patel P *et al*. [19], Sonkar N *et al*. [20], Cotton E *et al*. [23], Gawda T *et al*. [24], Wabe YA *et al*. [25], showed that *E. coli* was most commonly isolated and other organisms included proteus, *Klebsiella, Staph. Aureus* and *saprophyticus* and *enterococcus.* The increased prevalence of *E. coli* might be attributed to poor genital hygiene & improper cleansing following defaecation & urination.

Antibiotics Sensitivity

A Cochrane systematic review conducted in 2000 examined five different treatment regimens but did not endorse any specific one. The review highlighted that resistance to ampicillin was present in 20 to 30% of *E. coli* infections.

Various studies have indicated that a single dose of any medication resulted in a lower success rate, ranging from 50 to 78% in terms of curing the infection. Consequently, most recommendations lean towards a 3 or 7-day treatment course.

In the current study, the sensitivity of *E. coli* to ampicillin was found to be 70%. Gram-negative bacilli and *Staphylococcus aureus* were all susceptible to cephalosporins and quinolones. Therefore, all patients received oral ciprofloxacin 500mg twice daily for 7 days, as quinolones were deemed unsuitable during pregnancy.

ASB and Neonatal Outcome

Early intervention for asymptomatic bacteriuria (ABU) during pregnancy at the initial prenatal appointment reduces the likelihood of premature birth, low birth weight, and the perinatal mortality linked with these complications. (Williams 2005). In this study preterm delivery occurred in 21% cases with bacteriurics and in 10% cases with non bacteriurics. In this study the prevalence of low-birth-weight baby among bacteriurics is 30.7% and in non bacteriuriacs is 11.6%. P value is 0.0564 and the differences is statistically not significant. In our study IUGR was present 7.7% cases among bacteriuriacs and 3.4% cases in non bacteriuriacs. So ASB is a risk factor for preterm baby, low birth weight and IUGR babies. A similar finding was found in a study by Mazor-Dray E *et al*. (2009) [26]. The antibiotic treatment of asymptomatic bacteriuria during pregnancy substantially reduces the incidence of preterm delivery and low birth weight infants comparable to that of non-bacteriurias.

Limitation of this Study

1. The present study belong to people exclusively of this region, thus limits the generalizability of the result to other ethnic group.
2. Sample size of the study was limited to 125. Large sample size would have given better results.
3. Time duration was 1 year only.

Conclusion

ASB, a prevalent bacterial infection, frequently complicates pregnancies, with an occurrence rate as high as 10.4%. The colony count continues to serve as the primary method for diagnosing asymptomatic bacteriuria (ASB), with counts equal to or greater than 10^5 colony-forming units per millilitre (CFU/ml) considered significant. *Escherichia coli* is the most

prevalent organism responsible for ASB, accounting for 77% of cases, followed by *Klebsiella species* (15%) and *Staphylococcus saprophyticus* (7%). ASB is frequently observed in primigravida, individuals with a history of UTI, anaemia, and those with an elevated BMI. Mixed infections are also frequently encountered. If left unrecognized and untreated, ASB can lead to adverse maternal outcomes such as pyelonephritis, anaemia, symptomatic urinary tract infections (UTIs), puerperal fever, wound infections, and sub-involution of the uterus. Similarly, adverse foetal outcomes may include threatened preterm labour, premature rupture of membranes (PROM), preterm births, decreased mean gestational age at birth, lower APGAR scores, reduced average birth weight, low birth weight (LBW), intrauterine growth restriction (IUGR), neonatal infections, hypoglycaemia, hyperbilirubinemia requiring phototherapy, apnoea, birth asphyxia, and prolonged stays in the neonatal intensive care unit (NICU).

Detecting and treating asymptomatic bacteriuria (ASB) early is crucial for improving pregnancy outcomes. Therefore, it is recommended to screen all pregnant women for ASB, ideally before conception or at the latest during the first trimester. If ASB is identified during pregnancy, it should be treated promptly with antibiotics and closely monitored thereafter.

Ethical Clearance: Prior to commencing the study, the necessary ethical approval was obtained from the "Institutional Ethics Committee", ensuring adherence to strict ethical standards. The privacy and confidentiality of all patients were meticulously maintained throughout the research process. Furthermore, each patient received care and attention in accordance with established hospital protocols, guaranteeing their safety and well-being.

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Conflict of Interest

Not available

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Not available

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