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Asymptomatic bacteriuria in pregnancy: systematic reviews of screening and treatment effectiveness

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Abstract

Background: Urinary tract infection is the most common bacterial infection during pregnancy and can lead to significant maternal and perinatal morbidity. There is increasing evidence suggesting that asymptomatic bacteriuria (ASB) is associated with an increased rate of transformation into cystitis or pyelonephritis if not treated in the initial period. The great majority of studies performed so far concerning women diagnosed with ASB have focused on screening techniques and assessing the risk factors. Not many studies have been conducted regarding the fetal and maternal outcomes of asymptomatic bacteriuria in our settings. To fill these lacunae, the current study was under taken.

Materials and Methods: The study was conducted among the pregnant women attending the antenatal clinic in Mahatma Gandhi Medical College and Hospital. The study was conducted from February 2023 to November 2023. A total of 300 pregnant women were screened for asymptomatic bacteriuria and followed up to delivery. Their babies were also followed up during the early neonatal period to study the neonatal outcome of babies born to mothers with a history of ASB during the antenatal period.

Results: The prevalence of asymptomatic bacteriuria in the present study is 26.66 percent. The most common organism causing ASB in this study was Escherichia coli 44.4 percent followed by 24.4 percent Streptococcus agalactiae. The results of drug sensitivity revealed that the most common isolate, Escherichia coli showed 73.3 percent sensitivity to Nitrofurantoin followed by 50 percent to Cefixime and Cefuroxime, 12.5 percent to Ampicillin. The highest incidence of bacteriuria was detected in second trimester of gestation. In this study, the majority of culture-positive women were Multigravida 62.50 percent.

Conclusion: Asymptomatic bacteriuria is a very commonly encountered medical condition in pregnant women and its quiet frequent in anemic women. Untreated ASB does pose a potential threat to the development of pyelonephritis, anemia, gestational hypertension, FGR in babies, preterm labor, and PPROM. The most common organism detected in the isolate in our study was Escherichia coli and it was noted to be most sensitive to Nitrofurantoin. Preterm labor was also quite common in those with ASB.

Keyword: Asymptomatic bacteriuria, Pregnancy, Preterm labour, Urinary tract infections.

Introduction

Pregnancy causes numerous physiological and hormonal changes which make women more susceptible to infections in comparison to other lifetime circles (1). Urinary tract infections are the most common bacterial infections during pregnancy and can lead to significant maternal and perinatal morbidity. They can manifest as asymptomatic bacteriuria, acute urethritis, acute cystitis, or pyelonephritis.

Urinary tract infections in pregnancy are classified as either asymptomatic or symptomatic. Asymptomatic bacteriuria is defined as the presence of actively multiplying bacteria in the urinary tract excluding the distal urethra in patients without any obvious urinary symptoms.

ASB accounts for 2-10% of pregnancies in affluent countries (Whalley and Cunningham 2000) (4).

Its incidence worldwide varied from 5-10% and depends on age, parity, race, and socioeconomic status (2) . The prevalence of ASB varies from (range 2-11%) and is similar to that observed in non-pregnant women (5) .

Asymptomatic bacteriuria can be seen in the general population but by virtue of short urethra and being in close proximity to the vagina, women are more prone to UTI and more so during pregnancy (2) . Although pregnancy does not predispose a woman to the acquisition of ASB, it does predispose her to acute upper urinary tract infection or pyelonephritis (5). The relatively high prevalence of asymptomatic bacteriuria in pregnancy, the significant consequences for women and pregnancy, the reported adverse effects in pregnancy outcome plus the ability to avoid sequelae with treatment, justifies screening of pregnant women for the presence of bacteriuria using a protocol based on urine tests and urine culture and adequate treatment of all cases of ASB (2).

Material and Methods

This prospective study was done on Patients attending the Obstetrics and Gynaecology department of Mahatma Gandhi Medical College and Hospital, Jaipur.

Study Site: Department of Obstetrics and Gynecology, Mahatma Gandhi Medical College and Hospital, Jaipur.

Study Population: All antenatal patients diagnosed with asymptomatic bacteriuria by urine examination who attended the Obstetrics, Gynaecology outpatient clinic and those who were admitted as an inpatient in the department of Obstetrics, Gynaecology.

Study Duration: The study was conducted over a period of 10 months from February 2023 to November 2023.

Study Design: A prospective study.

Inclusion Criteria

- Pregnant women who attended the ANC for the first visit.
- Pregnant women who gave consent for participating

Exclusion Criteria

- Pregnant women with symptoms of urinary tract infections like abdominal pain, fever, burning micturition, frequency of micturition, and dysuria.
- Patients with a history of UTI in the past 1 year or during this pregnancy.
- Patients who has taken antibiotics in last 6 months.

Methodology: All antenatal mothers who satisfied the inclusion criteria were enrolled in the study after obtaining informed consent during their first antenatal visit. Using a well- structured pro- forma which included details regarding the demography, complaints (UTI symptoms), period of gestation, obstetric history, and past medical history was collected.

Complete general examination and obstetric examination were carried out during their OP visit. During their first antenatal visit as part of the routine antenatal investigations, urine samples were collected according to the standard Midstream clean catch method from all the pregnant women and immediately transported to the laboratory for routine urine analysis, microscopy and culture. A colony count of 10 5 or more pure isolates was considered positive for significant bacteriuria.

All antenatal patients with ASB provide the primary outcome of this study which was to assess the prevalence of ASB in the pregnant population. They were started on appropriate antibiotics to prevent the progression of the disease to cystitis or pyelonephritis and they were followed up till delivery to assess the secondary outcome of this study. Both the intrapartum and post-partum condition of the mother and baby was assessed to know about the maternal and fetal outcome.

Primary Outcome: Prevalence of antenatal mothers with asymptomatic bacteriuria.

Secondary Outcome: The adverse fetal and maternal outcomes in pregnant women with asymptomatic bacteriuria.

Data Collection Methods: All the data collected were entered by the principal investigator in an interviewer-administered questionnaire. This proforma contains relevant clinical history, examination findings, and investigation details.

Statistical Methods: All data were entered into MS Excel and analyzed using the statistical software SPSS version 20 for windows. Continuous variables were expressed as Mean ± Standard Deviation and categorical variables were expressed as frequency and percentages.

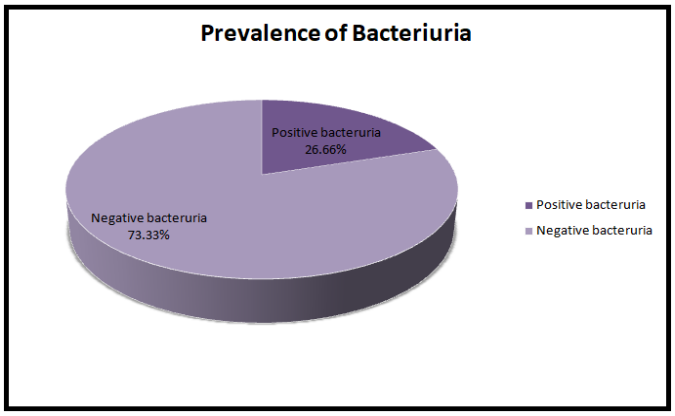
Results

All pregnant women total of 300 cases were screened for asymptomatic bacteriuria and followed up to delivery in the Department of Obstetrics and Gynaecology. Their babies were also followed up during the early neonatal period to study the neonatal outcome of babies born to mothers with a history of ASB during the antenatal period.

Table 1: Prevalence of Bacteriuria

Sn.	Asymptomatic Bacteriuria	Frequency	Percent
1.	Positive	80	26.66%
2.	Negative	220	73.33%
	Total	300	100%

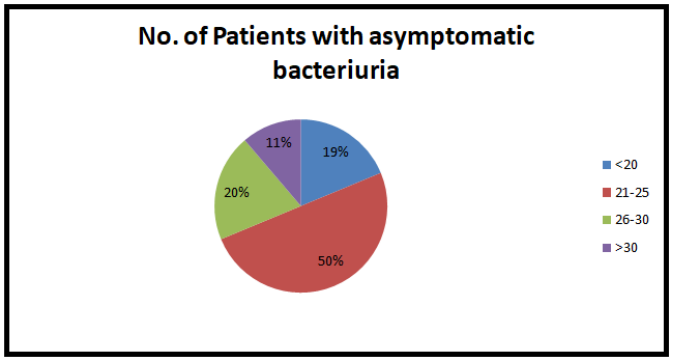
Of the 300 antenatal mothers studied 20.0 percent i.e., 80 (26.66%) patients tested positive for ASB whereas 220 (73.33%) were negative for the disease.



Age

Age Group	No. of Patients with asymptomatic bacteriuria	Percentage
<20	15	18.75
21-25	40	50
26-30	16	20
>30	9	11.25
Total	80	100

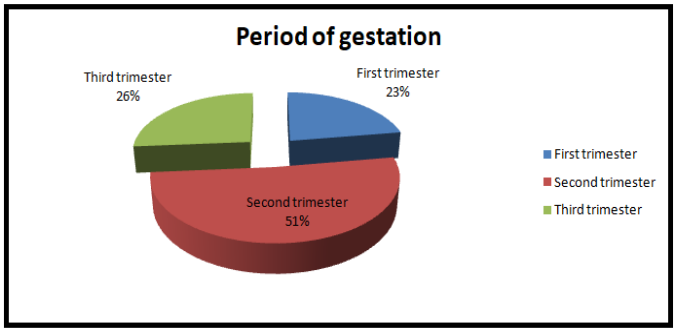
The above table shows that among 80 cases with asymptomatic bacteriuria, 44 cases belonged to the age group of 21-25 years, 24 cases belonged to 26-30 years, 13 patients belonged to 20 years and 4 patients were > 30 years.



Gestational Age

Period of gestation	No. of patients with asymptomatic bacteriuria	Percentage
First trimester	18	22.50
Second trimester	41	51.25
Third trimester	21	26.25
Total	80	100

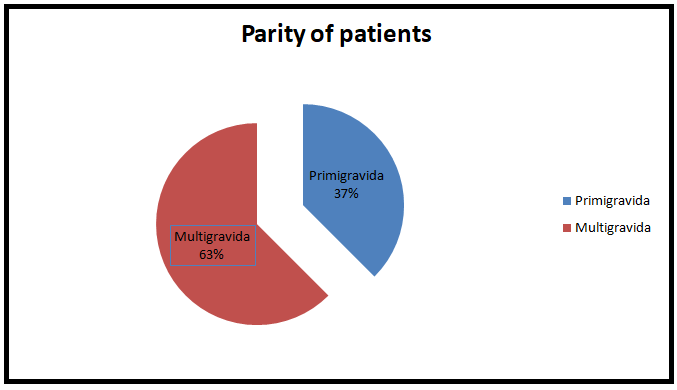
This table shows that among 80 cases with asymptomatic bacteriuria, 41 patients were in the second trimester of pregnancy, 21 patients were in the third trimester and 18 patients were in the first trimester.



Parity

Parity	No. of patients with asymptomatic bacteriuria	%
Primigravida	30	37.50
Multigravida	50	62.50
Total	80	100.00

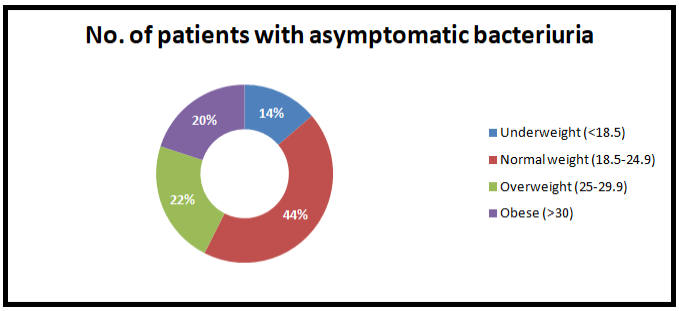
This table shows that among 80 cases with asymptomatic bacteriuria, 50 were Multigravida and 30 were Primigravida.



BMI

BMI (kg/m^2)	No. of patients with asymptomatic bacteriuria	Percentage
Underweight (<18.5)	11	13.75
Normal weight (18.5-24.9)	35	43.75
Overweight (25-29.9)	18	22.50
Obese (>30)	16	20.00
Total	80	100.00

The above table shows among 80 cases with asymptomatic bacteriuria, 35 patients had normal BMI, 18 patients who were overweight, 16 patients were obese and 11 patients were underweight.



Organisms Causing Bacteriuria

The commonest bacterium which was detected in culture was Escherichia coli 44.4 percent followed by 24.4 percent Streptococcus agalactiae, 8.8 percent Enterococcus faecalis, and Klebsiella pneumoniae, 4.4 percent Staphylococcus aureus, 2.3 percent Enterobacter aerogenous, Staphylococcus hemolyticus, Acinetobacter baumanni, and Streptococcus faecalis.

List of organisms causing asymptomatic Bacteriuria

Bacterial isolates	Frequency	Percent
Escherichia coli	36	44.4
Streptococcus agalactiae	20	24.4
Enterococcus faecalis	7	8.8
Klebsiella pneumoniae	7	8.8
Staphylococcus aureus	4	4.4
Staphylococcus hemolyticus	2	2.3
Acinetobacter baumanni	2	2.3
Streptococcus faecalis	2	2.3

Antibiotic sensitivity

URINE C/S			ANTIBIOTICRX				Total
	Ampicillin	Nitrofurantoin	Amoxycillin	Fosfomycin	Cefixime	Cefuroxime	
Enterobacter aerogenous	0	0	0	0	1	0	1
	0	0	0	0	10%	0	2.2%
Escherichia coli	1	11	0	0	5	3	20
	12.5%	73.3%	0	0	50%	50%	44.4%
Streptococcus agalactiae	6	0	4	0	1	0	11
	75%	0	100%	0	10%	0	24.4%
Staphylococcus aureus	0	1	0	0	1	0	2
	0	6.7%	0	0	10%	0	4.4%
Enterococcus faecalis	1	3	0	0	0	0	4
	12.5%	20%	0	0	0	0	8.9%
Klebsiella pneumoniae	0	0	0	2	1	1	4
	0	0	0	100%	10%	16.7 %	8.9%
Staphylococcus Hemolyticus	0	0	0	0	1	0	1
	0	0	0	0	10%	0	2.2%
Acinetobacter baumanni	0	0	0	0	0	1	1
	0	0	0	0	0	16.7%	2.2%
Streptococcus faecalis	0	0	0	0	0	1	1
	0	0	0	0	0	16.7%	2.2%

The most common isolate E.coli was found to show maximum sensitivity to Nitrofurantoin 73.3 percent followed by 50 percent sensitivity to Cefixime and Cefuroxime and 12.5 percent sensitivity to Ampicillin. The second most common isolate Streptococcus

agalactiae showed maximum sensitivity to Amoxycillin at 100 percent followed by Ampicillin at 75 percent and Cefixime at 10 percent. Enterococcus faecalis showed 20 percent sensitivity to Nitrofurantoin and 12.5 percent sensitivity to Ampicillin. Klebsiella pneumoniae had 100 percent sensitivity to Fosfomycin, 16.7 percent sensitivity to Cefuroxime, and 10 percent sensitivity to Cefixime.

Maternal Complications

A variety of medical conditions were noted in these mothers which were associated with ASB. 31.5 percent had anemia, 12.5 percent had pre-eclampsia, 13.75 percent had gestational hypertension, and 18.75 percent with FGR, and 6.25 percent of these mothers had pyelonephritis which required treatment.

Comparison of Maternal Complications

Maternal Complications	Asymptomatic Bacteriuria Patients
Nil	15
	18.75%
Anemia	25
	31.25%
Pre-eclampsia	10
	12.5%
Pyelonephritis	4
	6.25%
FGR	15
	18.75%
Gestational hypertension	11
	13.75%

Indications for Delivery

In this study, the indication for delivery in 15.0 percent of the patients had preterm labor followed by 15.0 percent PROM, 5.0 percent PPROM, and 5.0 percent had fetal distress.

Comparison of Indication for Delivery

Indication	Patients with bacteriuria
Term	48
	60.0%
Preterm	12
	15.0%
Severe FGR	0
	0
PPROM	4
	5.0%
PROM	12
	15.0%
Fetal distress	4
	5.0%

Mode of Delivery

In this study among the patients with bacteriuria, only 12.5 percent had preterm deliveries whereas 57.5 percent underwent full-term normal delivery and 30.0 percent underwent cesarean section at term.

Comparison of the Mode of Delivery

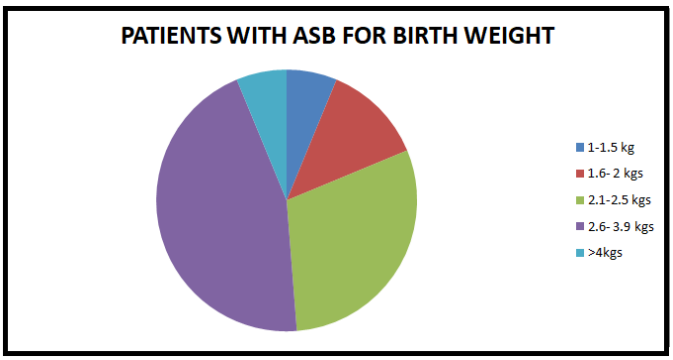
Mode of delivery	Patients with asymptomatic bacteriuria
FTND	46
	57.5%
LSCS	24
	30.0%
PTVD	10
	12.5%
Total	80

Birth weight

Among the babies born to mothers with a history of ASB 45.0 percent had birth weight between 2.6 – 3.9kg, followed by 30.0 percent between 2.1-2.5kg, 12.5 percent between 1.6-2kg, 6.25 percent had both extremes of birth weight i.e., more than 4kg andlessthan1.5kg.

Comparision of Birth Weight

Birth weight	Bacteriuria
1-1.5kg	5
	6.25%
1.6-2kgs	10
	12.5%
2.1-2.5kgs	24
	30.0%
2.6-3.9kgs	36
	45.0%
>4kgs	5
	6.25%
Total	80

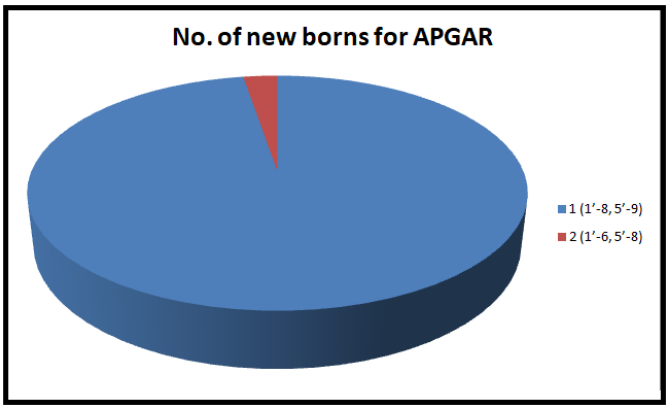


APGAR score

Of the babies born to mothers with a history of bacteriuria 92.5 percent had an APGAR score of 1'-8, 5'-9, and only 2.5 percent had an APGAR score of 1'-6, 5'- 8.

Comparison of Apgar score for the New Borns

APGAR	Patients with asymptomatic bacteriuria
1 (1'-8,5'-9)	74
	92.5%
2 (1'-6,5'-8)	6
	2.5%
Total	80



Resuscitation and NICU Admission

Out of the babies born to mothers with bacteriuria, 95.0 percent did not require any resuscitation or NICU admission, and only 5.0 percent of babies required resuscitation and NICU admission.

Comparison of Resuscitation in Newborns

Resuscitation	Patients With Asymptomatic Bacteriuria
No	76
	95.0%
Yes	4
	5.0%
Total	80

Comparison of NICU Admission

NICU Admission	Patients With Asymptomatic Bacteriuria
No	76
	95.0%
Yes	4
	5.0%
Total	80

Discussion

A total of 80 pregnant women were screened for asymptomatic bacteriuria and followed up to delivery in the Department of Obstetrics and Gynecology. Their babies were also followed up during the early neonatal period to study the neonatal outcome of babies born to mothers with a history of ASB during the antenatal period.

The prevalence of asymptomatic bacteriuria in the present study is 26.66 percent.

Globally the prevalence of ASB in pregnancy is said to vary between 4 percent to 23.9 percent. (2) A study by Aziz Marjan, conducted in Pakistan showed a prevalence of 6.2 percent in the study group and 2.85 percent in the control group (14) . Various Indian studies have shown the prevalence of ASB in pregnancy to vary from 7.4 percent to 11.8 percent. A study by Vandana N from India had a prevalence of 13.3 percent (2) .

The majority of women in this study belonged to the age group of 21-25 years which was comparable in a patient with ASB. In this study, the majority of culture-positive women were Multigravida 62.50 percent. This was similar to that of a study by Vandana N, 63.5 percent (2) , whereas, in other studies by B Prasanna (62 percent), V Mallikarjun Rao (58.3 percent), and Okonko et al Multigravida showed a higher incidence of bacteriuria (15-17) . The highest incidence of bacteriuria was detected in second trimester of gestation, 51.25 percent. The mean BMI was 28.6 and 43.75 percent with bacteriuria belonged to the normal range.

The medical conditions noted in mothers with a positive urine culture included anemia 36.25 percent. In a similar study by Byna P anemia was noted in 35 percent, preeclampsia in 5 percent, and pyelonephritis in 3.5 percent noted. In another study by Jain anemia was 22.4 percent, preeclampsia 5.2 percent, and pyelonephritis 1.7 percent noted and both studies had a significant association. (4,11). The most common organism causing ASB in this study was Escherichia coli with 44.4%. A similar study by Basumatory BK documented that E.coli 56.75 percent was the most common pathogen isolated followed by Klebsiella 14.33 percent (18) . These findings correlate with the study by Lallar M in which Ecoli 69 percent was the most common organism but with a higher isolation rate, followed by coagulase-negative Staphylococcus and Staphylococcus aureus 11 percent followed by Klebsiella 4 percent and Enterobacter 5 percent cases (19) . In another study by Olamijulo JA done in Nigeria Klebsiella 39.2 percent was isolated as the most common pathogen (12).

In this study, the results of drug sensitivity revealed that the most common isolate, Escherichia coli showed 73.3 percent sensitivity to Nitrofurantoin followed by 50 percent Cefixime and Cefuroxime, 12.5 percent to Ampicillin. Streptococcus agalactae had 100 percent sensitivity to Amoxycillin, 75 percent to Ampicillin, and 10 percent to Cefixime. Enterococcus faecalis had 20 percent sensitivity to Nitrofurantoin and 12.5 percent sensitivity to Ampicillin. Klebsiella pneumoniae showed 100 percent sensitivity to Fosfomycin followed by 16.7 percent to Cefuroxime and 10 percent to Cefixime. Staphylococcus aureus showed 67 percent sensitivity to Nitrofurantoin.

In a similar study conducted by R Sujatha the most common isolate Ecoli showed maximum sensitivity to Cefixime at 100 percent followed by Ceftriaxone at 95 percent,

Cefuroxime at 86 percent, Ampicillin at 61 percent and Amoxycillin clavulanic acid 70 percent sensitivity (20) .In the study of Basumatary BK, Nitrofurantoin, 87.88 percent showed the highest sensitivity followed by Norfloxacin at 79.89 percent and Amikacin at 77.96 percent.

Nitrofurantoin in pregnancy appeared to be safe but the choice of antibiotics for the treatment should be guided by antimicrobial susceptibility whenever possible. (18)

Out of the 80 patients with bacteriuria 60.0 percent had undergone term labor. This finding correlates with a study by Lallar M in which the likelihood of preterm labor in the cases was 14.5 times more than in the control group. Among the cases in that study, 31 percent of subjects had preterm labor whereas in the control group only 3 percent of subjects had preterm labor (19). In this study among the culture-positive patient, 57.5 percent of them underwent normal vaginal delivery at.

Summary

A total of 300 pregnant women were screened for asymptomatic bacteriuria and followed up to delivery in the Department of Obstetrics and Gynecology. Their babies were also followed up during the early neonatal period to study the neonatal outcome of babies born to mothers with a history of ASB during the antenatal period. The prevalence of asymptomatic bacteriuria in the present study is 26.66 percent. Globally the prevalence of ASB in pregnancy is said to vary between 4 percent to 23.9 percent. The majority of women in this study belonged to the age group of 21-25 years. In this study, the majority of culture-positive women were multigravida 62.5 percent. The highest incidence of bacteriuria was detected in second trimester of pregnancy. Patients with ASB are at a higher risk of developing anemia, preeclampsia, pyelonephritis, gestational hypertension, and FGR as sequelae. The most common organism causing ASB in this study was Escherichia coli 56.25 percent followed by others. The results of drug sensitivity revealed that 33.3 percent of isolates were sensitive to Nitrofurantoin followed by 22.2 percent sensitivity to Cefixime, 17.8 percent sensitivity to Ampicillin, 13.3 percent sensitive to Cefuroxime, 8.9 percent sensitivity to Amoxycillin and 4.4 percent sensitivity to Fosfomycin. In this study among the culture-positive patient, 57.5 percent of them underwent normal vaginal delivery at term.

Conclusion

A total of 300 pregnant women were screened for asymptomatic bacteriuria and followed up to delivery in the Department of Obstetrics and Gynecology. Their babies were also followed up during the early neonatal period to study the neonatal outcome of babies born to mothers with a history of ASB during the antenatal period. The prevalence of asymptomatic bacteriuria in the present study is 26.66 percent. Majority of the pregnant women belonged to the age group of 21-25 years. The incidence of bacteriuria was high in gestational age i.e., second trimester.

The other significant observation seen was, most common organism causing ASB inthis study was Escherichia coli 44.4 percent. The results of drug sensitivity revealed that 33.3 percent of isolates were sensitive to Nitrofurantoin followed by 22.2 percent sensitivity to Cefixime, 17.8 percent sensitivity to Ampicillin.

References

1. Emami A, Javanmardi F, Pirbonyeh N. Antibiotic Resistant Profile Of Asymptomatic Bacteriuria In Pregnant Women: A Systematic Review And Metaanalysis. Expert Rev Anti Infect Ther. 2020 Aug: 18(8):807-815.
2. Vandana N, Prabhu TRB, Meda S, Damodaran V. An Analytical Study To Evaluate The Prevalence, Screening Methods, And Maternal And Perinatal

Outcome Associated With Asymptomatic Bacteriuria. IJOPARB. 2020;14-19.

3. Schnarr J, Smaill F. Asymptomatic Bacteriuria And Symptomatic Urinary Tract Infections In Pregnancy. Eur J Clin Invest. 2008;38:50–57.
4. Byna P, Muvva N, Kolli S, Shaik MV. A Study Of Risk Factors And Consequences Of Asymptomatic Bacteriuria In Pregnant Women And Fetomaternal Outcome. Int J Reprod Contracept Obstet Gynecol. 2015;4(5):1300– 1305.
5. K. Mukherjee, S Golia, C Vasudha, Babitha, Debojyoti Bhattacharjee, Goutham Chakroborthi. A Study On Asymptomatic Bacteriuria In Pregnancy: Prevalence, Etiology, And Comparison Of Screening Methods. Int J Res Med Sci.2014 Aug:2(3):1085-1091.
6. Izuchukwu KE, Oranu EO, Bassey G, Orazulike NC. Maternofetal Outcome Of Asymptomatic Bacteriuria Among Pregnant Women In A Nigerian Teaching Hospital. Pan Afr Med J.2017 Jan; 27:69;1937-8688.
7. Akerele J. Prevalence Of Asymptomatic Bacteriuria Among Pregnant Women In Benin City, Nigeria. J Obstet Gynaecol. 2001;21(2):141–144.
8. Barbara L. Hoffman, Brian M Carey, Gary Cunningham , Kenneth J Leveno, Steven L Bloom , Catherine Y Spon, Jodi S Dashe, Williams Obstetric 25 th Ed. New York: Mc Graw-Hill:2018:Maternal Physiology, Renal, And Urinary Tract Disorder, 153-59, 2268- 74.
9. Sheiner E, Mazor-Drey E, Levy A. Asymptomatic Bacteriuria During Pregnancy. J Matern-Fetal Neonatal Med Off J Eur Assoc Perinat Med Fed Asia Ocean Perinat Soc Int Soc Perinat Obstet. 2009 May;22(5):423–427.
10. Smaill FM, Vazquez JC. Antibiotics For Asymptomatic Bacteriuria In Pregnancy. Cochrane Database Syst Rev. 2019 Nov25;2019(11):CD000490.
11. Jain V, Das V, Agarwal A, Pandey A. Asymptomatic Bacteriuria & Obstetric Outcome Following Treatment In Early Versus Late Pregnancy In North Indian Women. Indian JMed Res. 2013 Apr;137(4):753–8.
12. Olamijulo JA, Adewale CO, Olaleye O. Asymptomatic Bacteriuria Among AntenatalWomen In Lagos. J Obstet Gynaecol J Inst Obstet Gynaecol. 2016 Aug;36(6):722–5.
13. Quiroga-Feuchter G, Robles-Torres RE, Ruelas-Morán A, Gómez-Alcalá AV.Asymptomatic Bacteriuria Among Pregnant Women. An Underestimated Threat.
14. Rev Médica Inst Mex Seguro Soc. 2007;45(2):169–172.
15. Khattak AM, Khattak S, Khan H, Ashiq B, Mohammad D, Rafiq M. Prevalence OfAsymptomatic Bacteriuria In Pregnant Women. Pak J Med Sci. 2006 Apr;22(2):162.
16. Prasanna B, Naimisha M, Swathi K, Shaik MV. Prevalence Of AsymptomaticBacteriuria In Pregnant Women, Isolates, And Their Culture Sensitivity Pattern. Int JCurr Microbiol App Sci. 2015;4(8):28-35.
17. Rao VM, Venkatesh BS, Rao SR. Asymptomatic Bacteriuria In Pregnant Women-Study At A Tertiary Maternity Care Hospital In Hyderabad. Int. J. Curr Microbiol. AppSci. 2018;7(5):1133-42.
18. Okonko Et Al. Incidence Of Urinary Tract Infection (UTI) Among Pregnant Women In Ibadan, South-

Western Nigeria. African Journal Of Biotechnology 2009;8(23).P 6649-57.

19. Basumatary BK, Dutta BK, Choudhury N. Asymptomatic Bacteriuria Among Pregnant Women Attending Antenatal Clinic At A Tertiary Care Centre. IJRCOG. 2020 Feb 1;9(2):528-33.
20. Lallar M, Ul Haq A, Nandal R. Asymptomatic Bacteriuria: Predisposing Factors AndCorrelation With Preterm Labor In Low Resource Settings. Int J Reprod ContraceptObstet Gynecol. 2014;3(2):404.
21. Sujatha R, Nawani M. Prevalence Of Asymptomatic Bacteriuria And Its Antibacterial Susceptibility Pattern Among Pregnant Women Attending The Antenatal Clinic At Kanpur: JCDR. 2014 Apr;8(4): DC01-DC03
22. Schneeberger C, Kazemier BM, Geerlings SE. Asymptomatic Bacteriuria And UrinaryTract Infections In Special Patient Groups: Women With Diabetes Mellitus And Pregnant Women. Curr Opin Infect Dis. 2014;27(1):108–114.
23. Garnizov TM. Asymptomatic Bacteriuria In Pregnancy From The Perspective Of Public Health And Maternal Health Care: Review And Case Report. Biotechnol Biotechnol Equip. 2016;30(3):443–447.
24. Grio R, Porpiglia M, Vetro E, Uligini R, Piacentino R, Minì D, Et Al. Asymptomatic Bacteriuria In Pregnancy: A Diagnostic And Therapeutic Approach. Panminerva Med. 1994 Dec;36(4):195-197.
25. Wingert A, Pillay J, Sebastianski M, Gates M, Featherstone R, Shave K, Et Al. Asymptomatic Bacteriuria In Pregnancy: Systematic Reviews Of Screening And Treatment Effectiveness And Patient Preferences. BMJ Open [Internet]. 2019
26. Hazhir S. Asymptomatic Bacteriuria In Pregnant Women. Urol J. 2007 Winter;4(1):24- 27.
27. Akinloye O, Ogbolu DO, Akinloye OM, Terry Alli OA. Asymptomatic Bacteriuria Of Pregnancy In Ibadan, Nigeria: A Re- Assessment. Br J Biomed Sci.2006;63(3):109–112.
28. Jayalakshmi J, Jayaram VS. Evaluation Of Various Screening Tests To Detect Asymptomatic Bacteriuria In Pregnant Women. Indian J Pathol Microbiol. 2008 Jul 1;51(3):379-81.
29. Lavanya SV, Jogalakshmi D. Asymptomatic Bacteriuria In Antenatal Women. Indian JMed Microbiol. 2002 Apr 1;20(2):105-6.
30. Kerure SB, Surpur R, Sagarad SS, Hegadi S. Asymptomatic Bacteriuria Among Pregnant Women. IJRCOG. 2013 Jun 1;2(2):213-7.
31. Leela KV, Ravinder T, Hemalatha S, Prabha P, Chandrasekaran K. Evaluation Of Screening Tests To Detect Asymptomatic Bacteriuria In Antenatal Women. Int J Curr Microbiol App Sci. 2017 Jan 15;6(1):168-74.
32. Glaser AP, Schaeffer AJ. Urinary Tract Infection And Bacteriuria In Pregnancy. Urologic Clinics. 2015 Nov 1;42(4):547-60.
33. Mittal P, Wing DA. Urinary Tract Infections In Pregnancy. Clinics In Perinatology. 2005 Sep 1;32(3):749-64.
34. Senthinath Et Al. Prevalence Of Asymptomatic Bacteriuria Among Antenatal Women In Rural Tertiary Care Hospital, Tamilnadu, India. Int J Curr Microbiol App Sci. 2013;2(1):80-5.
35. Ansari HQ, Rajkumari A. Prevalence Of Asymptomatic Bacteriuria And Associated Risk Factors Among Antenatal Patients Attending A

Tertiary Care Hospital. J Med Allied Sci. 2011 Jul 31;1(2):74-78.

36. Chacko B, Sohi I. Early Onset Neonatal Sepsis. IJP. 2005 Jan;72(1):23-6.
37. Matuszkiewicz-Rowińska J, Małyszko J, Wieliczko M. State Of The Art Paper UrinaryTract Infections In Pregnancy: Old And New Unresolved Diagnostic And Therapeutic Problems. Archives Of Medical Science. 2015 Feb 28;11(1):67-77.
38. Tahir S, Tayyab M, Rasul S, Jabeen S, Gul A. Prevalence Of Asymptomatic Bacteriuria, Associated Risk Factors And Adverse Fetomaternal Outcome Among Antenatal Women Attending A Tertiary Care Hospital. Pak J Med Health Sci. 2015 Oct 1;9(4):1399- 402.
39. Gayathree L, Shetty S, Deshpande SR, Venkatesha DT. Screening For Asymptomatic Bacteriuria In Pregnancy: An Evaluation Of Various Screening Tests In Hassan District Hospital, India. J Clin Diagn Res. 2010 Aug;4(4):2702-6.