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Original Research Article

Pregnancy Associated Asymptomatic Bacteriuria and Its Obstetrical Outcome Following Diagnosis and Treatment In Early Versus Late Pregnancy

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Abstract: The objective is to study the maternal and fetal outcome following diagnosis and treatment of asymptomatic bacteriuria of pregnancy in early versus late pregnanacy. 170 women were divided into 2 groups-Group A -Period of gestation less than 20 weeks. Group B - Period of gestation between 28-34 weeks. A midstream specimen of urine was obtained in the clinic from the women and sent for culture and sensitivity. Culture of micro organism in urine was done on CLED medium. The plates were read after 24hrs of aerobic incubation at 37*c. A sample with single organism obtained in counts $>10^5$ colony was taken as positive. Rate of prevalence of aymptomatic bacteriuria was 16.67% in Group A while it was 22.02% in Group B E.coli was the most common organism isolated in 60.71% and 59.46% of early detected and late detected group followed by enterococcus.64.86% of women in late detected women gave birth to babies having birth weight <2500 gm while only 18.82% in ASB Negative group delivered babies having birth weight <2500gm. The above study suggests that all pregnant women should undergo routine urine culture in early pregnancy to avoid various complications like preeclampsia, preterm labor, low birth weight babies.
Keywords: asymptomatic bacteriuria, preeclampsia, preterm labor, low birth.

INTRODUCTION

Asymptomatic bacteriuria means when a patient has no urinary tract symptoms, but has bacteria in his/her urine. Most urinary specimen which are contaminated during collection have less than 10,000 bacteria/ml of urine while specimens obtainbed from significantly bacteriuric patient contain more than 100,000/ml of urine which is known as “signifcant bacteriuria”.

Asymptomatic bacteriuria is one of the clinical manifestations of UTI. It is defined as persistent and actively multiplying bacteria in significant numbers.i.e.,10^5 bacteria per milliliter(ml)within the urinary tract without any obvious symptoms[1]. It is also known as Covert bacteriuria. Urinary tract infections(UTI) are common in pregnancy. Because of hormonal and mechanical factors, which increases risk for urinary stasis and uterovesical reflux. Progesterone levels rise during pregnancy which causes relaxation of smooth muscles of the whole urinary tract resulting in dilatation of the pelvis and ureter and vesico-ureteral reflux. Stasis of urine predispose to risk of UTIs. This risk is aggravated by a short urethra and difficulty with hygiene as a result of a distended and gravid uterus [2].

These pathological conditions begin in 6^{th} week and peak during weeks 22 to 24 and thus prevent easy passage of urine[3]. The most common organism associated with bacteriuria in pregnancy is Escherichia coli followed by coagulase negative species of Staphylococci[4].

The gold standard investigation for detection of asymptomatic bacteriuria is urine culture. Therefore urine culture at first prenatal visit or between 12 to 16 weeks of gestation should be considered as a screening test of choice. Although first trimester screening and treatment for ASB during pregnancy is standard of care in developed countries and the role of specific antimicrobial therapy in pregnancy is well established [5]

Aims and Objectives

To study the maternal and fetal outcome following diagnosis and treatment of asymptomatic bacteriuria of pregnancy in early versus late pregnanacy.

Material and Methods:

Study Area -Department of obstetrics and gynaecology, SMS Medical college, Jaipur.

Study Design- Hospital based prospective cohort study.

Sample Size -The sample size was claculated to be 168 subjects for each group at alpha error of 0.05 @ power of 80% assuming relative risk of 0.28 of preeclamptic complication of asymptomatic bacteriuria with proportion in control group as per the seed article. So for study,170 ANC cases were taken in each group.

Inclusion Criteria

- Primigravida with singleton pregnancy attending antenatal clinic at Zenana hospital.

Exclusion Criteria

- Women already taking treatment for urinary tract infection.
- Fever with chills.
- Pregnancy with hypertension
- Pregnancy with diabetes mellitus
- Pregnancy with chronic illness.

170 Primigravida attending the antenatal clinic were included in the study inclusion and exclusion criteria were applied and informed consent was taken. They were divided into 2 groups according to gestational age:-

Group A :- Period of gestation less than 20 weeks

Group B :- Period of gestation between 28-34 weeks

A midstream specimen of urine was obtained in the clinic from the women and sent for culture and sensitivity within two hours of collection. Culture of microorganisms in urine was done on CLED (cysteine lactose electrolyte deficient)medium/ Macconkey agar and blood agar and blood agar using standard loop. The plates was read after 24hrs of aerobic incubation at 37 C.A sample with single organism obtained in counts $>10^5$ colony forming units was taken as positive. Sensitivity testing was done using drugs safe in pregnancy namely amoxiclav, ampicillin, cephalexin, ceftriaxone, amikacin, gentamicin and nitrofurantoin and linezolid. Women from both the groups were diagnosed and divided into 3 groups 1).early detected.2) late detected and 3)ASB negative. Women with positive urine culture of having ASB on the basis of urine culture report were treated as per the antibiotic sensitivity for 7 days. All women were followed 4 weekly till delivery. A special note was made for the develpoment of maternal complications like symptomatic UTI, pyelonephritis, preeclamptictoxemia, pretermlabor, premature rupture of membranes, intrauterine growth restriction, low birth weight.

Table-1: Distribution of cases according to Urine Culture

Urine Culture	Group A		Group B	
	No.	%	No.	%
Positive	28	16.67	37	22.02
Negative	140	83.33	131	77.98
Total	168	100.00	168	100.00

Above table shows high prevalence of asymptomatic bacteriuria in Group A(pregnancy <20 wks) which is 16.67% while in Group B it is 22.02% showing increased prevalence of ASB positive women in late presenting group I.e. between 28-32 wks of pregnancy.[6]conducted a study and found 5% prevalence of asymptomatic bacteriuria among 800 women.

Table-2:Distribution of cases according to organism isloted in Urine culture

Organism	Early detected		Late detected	
	jghu No.	%	No	%
Escherecia coli	17	60.71	22	59.46
Enterococcus faecalis	5	17.86	5	13.51
Staphylococcus aureus	4	14.29	5	13.51
Klebsiella pneumoniae	1	3.57	2	5.41
Proteus mirabilis	1	3.57	1	2.70
Coagulase negative staphylococcus	0	0.00	2	5.41

Above table shows that in both early and late detected group, E.coli was the most common organism isolate[6]. conducted a study and found that E. Coli(60%) was the most prevalent uropathogen isolated by culture followed by Klebsiella pneumonia(22.5%), Staphylococcus aureus and Pseudomonas(5%).

Table -3: Antibiotics sensitivity UTIs

Antibiotic susceptibility	E.coli	E.faecalis	S.aureus	K.pnuemoniae	P.mirabilis	Coag.Neg.Staphylococcus
Ampicillin	34 (87.17%)	10 (100.00%)	5 (55.55%)	1 (33.33%)	0 (0.00%)	1 (50.00%)
Amoxiclav	37 (94.87%)	10 (100.00%)	7 (77.77%)	3 (100.0%)	2 (100.0%)	2 (100.00%)
Nitrofurantoin	36 (92.31%)	8 (80.00%)	7 (77.77%)	1 (33.33%)	0 (0.00%)	0 (0.00%)
Cephalexin	39 (100.0%)	0 (0.00%)	9 (100.0%)	3 (100.0%)	2 (100.0%)	2 (100.00%)
Linezolid	39 (100.0%)	9 (90.00%)	9 (100.0%)	3 (100.0%)	2 (100.00%)	2 (100.00%)
Amikacin	34 (87.17%)	10 (100.00%)	8 (88.88%)	3 (100.0%)	2 (100.0%)	2 (100.00%)
Ceftriaxone	39 (100.0%)	10 (100.00%)	9 (100.00%)	3 (100.0%)	2 (100.00%)	2 (100.00%)

Above table shows that maximum number of organism were sensitive to antibiotics used commonly to treat UTIs. Ecoli was 100% sensitive to linezolid, Cephalexin and ceftriaxone, while Enterococcus was 100% sensitive to amoxiclav, amikacin, and ceftriaxone and 100% resistant to cephalexin[7] conducted a study and found that 77.5% of organism was sensitive to nitrofurantoin followed by cephalexin(67.5%), amoxicillin(60%),norfloxacin(52.5%),gentamicin(47.5 %).

RESULT

After doing study on 170 patients, we found that 100% women in early detected and 91.99% of women in late detected group were between 21-30 yrs of age.53.52% women in early detected and 67.57% of women in late detected group were from low socio economic status showing increased prevalence of ASB in this group.21.62% of late detected and 14.29% of early detected group women developed pre-eclampsia while in ASB Negative it was only 9.96%.27.02% of women in late detected group had preterm labor, while in ASB negative and early detected group it was 7.01% and 17.86% showing that late detection of ASB increases the chance of women having preterm labor as compared to ASB negative and early detected women. The incidence of low APGAR score at 5 min was higher among the neonates in late detected(29.73%) as compared to early detected(21.43%) and ASB negative(9.96%).45.95% neonates in late detected group was admitted in NICU while the NICU admission rate was 32.14% in early detected and 16.24% in ASB Negative group.

CONCLUSION

The above study suggest that if all pregnant women are subjected to routine urine culture and sensitivity in early pregnancy and adequately treated in time, complications like preeclampsia, pretermlabor, prelabour rupture of membranes, low birth weight babies, acute pyelonephritis and NICU admissions can be prevented to some extent.

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