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RESEARCH ARTICLE

ASYMPTOMATIC BACTERIURIA IN ANTENATAL PATIENTS.

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Anemia, Asymptomatic Bacteriuria,
E.Coli, Perinatal Outcome, Pregnancy.

Abstract

Introduction: Urinary tract infections (UTI) affects all ages, but women are more susceptible. UTI is a common problem in pregnancy due to various morphological and physiological changes that takes place in the genitourinary tract during pregnant state. Asymptomatic bacteriuria (ASB) refers to a condition in which urine culture reveals a significant growth of pathogens that is $>10^5$ bacteria/hpf, but without the presence of symptoms of UTI. Asymptomatic bacteriuria is found in 2-10% of pregnant women and pregnancy enhances the progression from asymptomatic to symptomatic bacteriuria which can lead to adverse maternal and foetal outcome.

Objectives: To assess the incidence of asymptomatic bacteriuria in antenatal patients and to identify the common pathogens responsible for the same.

Material& Methods: A total of 200 consecutive OPD/ IPD ANC patients, registered at a tertiary care centre, were taken for study after taking informed consent. Detailed history, general examination and obstetric examination along with routine ANC check-up was done for all patients. Mid-stream urine sample was collected from all patients at 16-20wks, 28-32wks and at 36wks. This sample is subjected to microscopic evaluation, urine culture and sensitivity and colony count. In case of positive report, women were treated as per the culture sensitivity report. All the positive subjects were re-evaluated for existence of asymptomatic bacteriuria. All the reports were recorded in a pre-designed proforma. Data was analyzed using statistical software SPSS ver. 21.

Results: ASB was observed in 7.5% subjects at 16-20weeks, 14% at 28-32 weeks and 8.5% subjects at 36 weeks with overall prevalence of 19% during pregnancy. Most common organism isolated was Escherichia coli (62%) followed by Klebsiella (20%) and Staph. Aureus (8%). A significant association was observed between ASB and maternal and foetal complications like pre-term delivery, anemia and low birth weight ($p<0.05$).

Conclusion: About one fifth of the pregnant females suffer from asymptomatic bacteriuria during pregnancy. Pregnant women with ASB are at increased risk for adverse maternal and fetal outcomes like anemia, pre-term delivery and low birth weight. We thus recommend

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that routine screening and treatment of ASB should be carried out on all antenatal patients in order to identify any unsuspecting infection.

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Introduction:-

Urinary tract Infection (UTI) is a common problem in pregnancy due to various morphological and physiological changes that takes place in the genitourinary tract during pregnant state [1,2]. UTI is of two types viz. symptomatic or asymptomatic. Asymptomatic bacteriuria (ASB) refers to the presence of bacteria in urine. It is a condition in which urine culture reveals a significant growth of pathogens that is $> 10^5$ bacteria/hpf, but without the presence of symptoms of urinary tract infection (UTI) [2]. The apparent reduction in immunity of pregnant women encourage the growth of both commensal and non-commensal microorganisms [3]. The physiological increase in the plasma volume during pregnancy, decrease urine concentration and approx. 70% of pregnant women develop glycosuria during this period, which encourages bacterial growth in the urine [4,5].

Asymptomatic bacteriuria is found in 2-10% of pregnant women and pregnancy enhances the progression from asymptomatic to symptomatic bacteriuria which can lead to complications like pyelonephritis, cystitis, chronic renal failure and adverse obstetric outcomes such as low birth weight, prematurity and higher foetal mortality rates [2,6]. The most common organism responsible is E.coli, which is found in about 75-90% cases of bacteriuria during pregnancy. About 40% of the asymptomatic bacteriuria cases develops into symptomatic UTI. Hence early detection by screening and appropriate treatment is of utmost importance not only to forestall maternal complications like acute pyelonephritis and chronic renal failure, but also to reduce chances of prematurity and fetal mortality in the offspring[4]. These adverse effects of undiagnosed asymptomatic bacteriuria on mother and child have made researchers to suggest routine culture screening for all pregnant women attending antenatal clinic [7,8] in order to prevent mother and child from any form of complication that may arise due to infection.

However, in developing countries, routine urine culture test is not carried out for ANC patients probably due to cost implication and time factor for culture result (usually 48 hours period). In many health centres of developing countries, the attention of health care providers is usually on the presence of glucose/ protein in urine specimens rather than possible asymptomatic infection.

Against this background, this work is aimed at determining the incidence and spectrum of asymptomatic bacteriuria in antenatal patients between 16-20 weeks of gestation at a tertiary care center.

Materials And Method:-

A hospital based prospective observational study was conducted at Department of Obstetrics, Bharati Hospital, Pune for duration of 2 years (1st September 2014 to 31st August 2016). A total of 200 consecutive OPD/ IPD ANC patients, registered at our hospital were taken for study after informed consent. Inclusion criteria included all females above 18 years old and of gestation age between 16-20 weeks. Detailed history, general examination and obstetric examination along with routine ANC check-up was conducted for all patients. Mid-stream urine sample was collected from all patients under aseptic conditions in a sterile container in each trimester. This sample was subjected to microscopic evaluation, urine culture and sensitivity and colony count. In cases of positive report, women were treated as per the culture sensitivity report. All the positive subjects were re-evaluated for existence of asymptomatic bacteriuria by urine evaluation after 1 month. All the collected data was entered in Microsoft Excel Sheet 2007. The data was then transferred and analyzed using SPSS ver. 21 using appropriate statistical tests.

A p-value of < 0.05 was taken as level of significance.

Results:-

Mean age of the study subjects was 24.4 years with most of them were between 21-25 years of age (57%). Forty six percent of females were primi-gravida while 53.5% were multi-gravida. Caesarean delivery was seen in 10.5% subjects while term delivery i.e. between 37-42 weeks were seen in 88.5% mothers (Table 1). A total of 50 organisms that is total 5 in number were isolated from 38 patients during their course of delivery. ASB was observed in 7.5%, 14% and 8.5% subjects in first, second and third trimester respectively while overall prevalence of ASB was 19% during pregnancy (Table 2). Most common organism isolated was E. coli (62%) followed by Klebsiella (20%), Staph. Aureus (8%), CiterobacterKoseri (6%) and Coagulase negative Staph. Aureus (4%) (Table 3). A

significant association was observed between ASB and maternal complications, anemia, pre-term delivery and foetal complications including low birth weight (Table 4).

Discussion:-

In our study the overall prevalence of ASB was observed as 19%. Various other Indian studies have shown a prevalence rate between 8.4% and 26% [9-25]. In present study, ASB was observed in 7.5%, 14% and 8.5% subjects in first, second and third trimester respectively. Thus approx. half of the cases (28/38) were in the second trimester. In a study by kashinath et al., more than half of the cases (68%) were in the second trimester [9]. Our results also concurs with the observations made in the previous Indian studies [13,16,24,25].

Bacterial isolates have been changing from time to time from place to place. In present study, a total of 50 organisms were isolated from 38 patients during their course of delivery. Most common organism isolated was E. coli (62%) followed by Klebsiella (20%), Staph. Aureus (8%), Citerobacter Koseri (6%) and Coagulase negative Staph. Aureus (4%). The results were in accordance with the study of kashinath et al., where the commonest bacterial isolate was E. coli (63.63%) followed by K. pneumoniae (18.18%) and Staphylococcus aureus (13.64%) [9]. The same trend has been reported in earlier studies [11,18,23,24]. This pattern could be due to the fact that urinary stasis is common in pregnancy and since most Escherichia coli strains prefer that environment, they cause UTI. Another reason could be as a result of poor genital hygiene practices by pregnant women who may find it difficult to clean their anus properly after defecating or clean their genital after passing urine [13].

In present study, we also observed that pregnant women with ASB are at increased risk for adverse maternal and fetal outcomes like anemia, pre-term delivery and low birth weight. Kashinath et al. in their study observed that undetected and untreated asymptomatic bacteriuria leads to hypertension and anemia in the mother and prematurity, intrauterine growth restriction etc. in the fetus [9]. Ansari et al. in their study of 125 asymptomatic pregnant women, observed a significant association of ASB with anemia [10].

Jain et al. observed increased incidence of preeclampsictoxaemia, preterm premature rupture of membrane (PPROM), preterm labour, intrauterine growth restriction and low birth weight in women with ASB as compared to ASB negative women [15]. Karuna T et al. in their study also observed that prenatal and postnatal complications were more common in asymptomatic bacteriuria patients [21]. Arvind K et al. in a prospective study of 300 pregnant women, observed that maternal and foetal morbidity was 28.6% and 21.4% in ASB positive females as compared to 9.9% and 10.3% in ASB negative females.

Conclusion:-

About one fifth of the pregnant females suffer from asymptomatic bacteriuria in the study area, which is quite high. We also observed that pregnant women with ASB are at increased risk for adverse maternal and fetal outcomes like anemia, pre-term delivery and low birth weight. We thus recommend that routine screening and treatment of ASB should be carried out on all antenatal patients in order to identify any unsuspecting infection. Besides this health education on personal hygiene should be imparted in the antenatal clinic. These measures will go a long way in reducing maternal and obstetric complications associated with ASB.

Table 1:- Distribution of patients according to Maternal Factors

Maternal Factors		N	%
Age Group (years)	<= 20	18	9.0%
	21- 25	114	57.0%
	26 -30	56	28.0%
	> 30	12	6.0%
Gravidity	Primi-gravida	93	46.5%
	Multi-gravida	107	53.5%
Parity	Primi- para	113	56.5%
	Multi-para	87	43.5%
Mode of Delivery	Vaginal	179	89.5%
	LSCS	21	10.5%
Type of Delivery	Term	177	88.5%
	Pre-term	23	11.5%

Table 2:- Term-wise and overall prevalence of Asymptomatic Bacteriuria

Asymptomatic Bacteriuria	N	%
1st term	15	7.5%
2nd term	28	14.0%
3rd term	17	8.5%
Overall	38	19.0%

Table 3:- Micro-organism level pattern observed during the study

Organisms found (n-42)	N	%
E Coli	26	61.9%
Klebsiella	8	19.0%
CitrobacterKoseri	3	7.1%
Staphylococcus aureus	3	7.1%
Coagulase negative staphylococci	2	4.8%
Total	42	100.0%

Table 4:- Association of Asymptomatic Bacteriuria with Maternal & Foetal factors

Variables	ASB		Total	p- value
	Yes	No		
Maternal Complications	20	13	33	<0.05
	52.6%	8.0%	16.5%	
Anaemia	11	28	39	<0.05
	28.9%	17.3%	19.5%	
Pre-term	17	6	23	<0.05
	44.7%	3.7%	11.5%	
Birth Weight< 2.5 Kg	29	80	109	<0.05
	76.3%	49.4%	54.5%	
Foetal Complications	19	14	33	<0.05
	50.0%	8.6%	16.5%	
NICU Admission	21	14	35	<0.05
	55.3%	8.6%	17.5%	

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