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INCIDENCE OF URINARY TRACT INFECTION BOTH SYMPTOMATIC AND ASYMPTOMATIC PATIENTS AMONG PREGNANT WOMEN RELATING TO ISOLATION AND IDENTIFICATION WITH ANTIBIOGRAM

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ABSTRACT: Urinary tract infections are the most common bacterial infections during pregnancy. Asymptomatic bacteriuria is a common problem in pregnancy and is associated with risk of preterm birth and pyelonephritis if untreated. **AIMS & OBJECTIVES:** The present study was aimed to evaluate the incidence of urinary tract infection in Symptomatic & Asymptomatic bacteriuria in pregnant women. **STUDY TYPE:** Prospective Study. **STUDY POPULATION:** Group A consists of 200 pregnant women with confirmed diagnosis of pregnancy and of all trimester with apparent signs and symptoms of UTI. Group B consists of 100 women with confirmed diagnosis of pregnancy and of all trimesters without any signs and symptoms of UTI and Group C consist of 20 healthy non pregnant women. **MATERIAL & METHOD:** Mid stream urine samples were collected from all women and processed by culture method. Isolates were identified based on colony characteristic and biochemical reaction and antibiotic susceptibility testing was done by modified Kirby-Bauer's disc diffusion method. **RESULT:** The incidence of significant bacteriuria in Group A is 15(7. 5%), Group B is 10(10%) and Group C is 1(5%). E. coli was the commonest organism isolated from all cases. Nitrofurantoin was the most sensitive drug followed by Ciprofloxacin for gram negative bacteria. **CONCLUSION:** Asymptomatic bacteriuria is common among antenatal women in the study. E. coli is the most frequent isolated pathogen.
KEYWORDS: Urinary tract infection (UTI), Nitrofurantoin (Nf), Escherichia Coli (E. Coli).

INTRODUCTION: Urinary tract infection (UTI) is one of the most common clinical syndromes encountered in general & Gynaecological practices. Urinary tract infection in female is more prevalent than male and is one of the most frequently seen medical complication in pregnancy.

UTI is more common in females due to factors like short urethra, pregnancy and easy faecal contamination. In pregnancy additional factors like increased bladder volume with decreased tone, decreased urethral tone cause urinary stasis. Bacterial urinary tract infection is usually acquired by ascending route from urethra to bladder. Haematogenous spread occur uncommonly.

MATERIAL & METHODS: The urine specimen collected from both symptomatic and asymptomatic patients attending OPD of O & G department in first, second and third trimesters of pregnancy. Group-A comprised of 200 pregnant women with pregnancy confirmed and of all trimesters, attending the obstetrics and gynecology out-patient department with apparent signs and symptoms of urinary tract infection. Group-B comprised of 100 pregnant women with confirmed diagnosis of pregnancy of all trimesters, attending the obstetrics and gynecology out-patient Department. Only those women were registered who fulfilled the criteria of apparently normal health without any signs of urinary tract infection. Group-C the control group comprised of 20 non-pregnant females.

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accompanying the patients as attendants. Isolation of causative organism their identification & antibiogram was carried out simultaneously during the study.

Urine samples were collected using a sterile wide mouthed 30ml container with a tightly fitting lid. All females were instructed to collect urine by midstream clean catch process into sterile container and to cover the lid tightly. After proper labeling of samples, they were immediately transported to the laboratory and processed within an hour. 2-3ml of urine was processed. With naked eye each sample was noted regarding their pH using pH papers with pH-range indicated by numbers and colour coding and was examined for albumin & sugar. After centrifugation microscopic examination of the urine was done which includes presence of pus cells, RBC cast & crystals. The specimen which shows more than 10 pus cells per field was taken for culture and sensitivity test. With the help of a sterile bacteriological standard loop calibrated to hold 0.004ml of urine was taken and was inoculated into culture media like CLED, BA and MAC. After inoculation, the inoculated plate was kept in an incubator maintaining temp at 37°C over-night. Next day the inoculated plate was examined by naked eye and colony morphology was studied. Some enzymatic test like catalase, slide and tube coagulase and oxidase test was done & the result noted.

Antibiogram is done by Kirby Bauer disc diffusion method using MHA with appropriate antibiotics such as Nitrofurantoin, Cephalexin, Gentamycin, Nalidixic acid, Amoxyclav, Norfloxacin, Ciprofloxacin, Ampicillin, and Erythromycin.

Before disc placement, the plate surface was inoculated using a swab that has been submerged in the bacterial suspension from the pure culture standardized to match the turbidity of the 0. 5Mc Farland turbidity standard (i. e,. 1.5 x 108 CFU/ml). The surface of the plate was swabbed in three directions to ensure an even and complete distribution of the inoculums over the entire plate. Within 15 minutes of inoculation the antimicrobial agent discs were applied and the plates incubated to avoid accumulation of moisture on the agar surface that can interfere with interpretation of test results. Then the plates were incubated at 370C for over 18 to 24 hours. The zone of inhibition around the antibiotic disc was measured as per Kirby Bauer method and interpreted as Sensitive, Intermediate and Resistant as per CLSI guidelines.

On the basis of the pathogenic or non-pathogenic organisms grown in semi-solid medium, gram stain, motility test, biochemical test, enzymatic test were done on the basis of which the species were identified.

RESULT: Forty two pregnant women (14.37%) has significant bacteriuria (100,000 or more bacteria/ml of urine), out of which 24 were symptomatic and 20 asymptomatic. (100,000 or more bacteria/ml of urine). Two women from the control group revealed bacteriuria giving an incidence of 4.34%. Bacterial count between 104/ml and 105/ml sample was repeated. The distribution of women enrolled in the study according to age group, 50% of women belonged to 26 to 30 years, followed by 31.25% women of age group 21 to 25 years. There were 18.75 % of women with >30 yrs of age.

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Gravida	Total No. Screened n= 320	Cases with Bacteriuria	
		Number	Percentage%
Primi Gravida	192	32	69.56 %
Multi Gravida	108	12	26.09 %
Control	20	2	4.35 %
Total	**320**	**46**	**100**
Table 1: Analysis of cases with relationship of parity and bacteriuria during pregnancy			

This table shows that the incidence of bacteriuria was more in primigravida (69.56%) than multigravida (26.09%).

Taking into consideration of trimester of pregnancy, literacy, area distribution and socio-economic status it has been found that, Urinary tract infection is more common in 2nd trimester of pregnancy in a women of low literacy, low socio economic status and from rural area.

Parameters	No. of cases	Percentage
1st Trimester	80	26. 67
2nd Trimester	180	60
3rd Trimester	40	13. 33
Total	**300**	**100**
Table 2: Analysis of cases based on Trimester		

This table shows that urinary tract infection is most common in second trimester of pregnancy (60%).

Study Group	No. of Culture Negative	Percentage (%)	No. of Culture Positive Cases	Percentage (%)	Total	Percentage (%)
Symptomatic	176	88	24	12	200	100
Asymptomatic	80	80	20	20	100	100
Control	18	90	2	10	20	100
Total	**274**	**85.68**	**46**	**14.37**	**320**	**100**
Table 3: Comparative Analysis of Culture Positive Women in different study group						

This table shows the comparative analysis of culture positive women in different study group. This shows that out of symptomatic group of 200 women, 176 women were culture negative and rest 24 women culture were positive. 100 women were in the asymptomatic group out of which 80 were culture negative and 20 were culture positive. In the control group, out of 20 women only two women were culture positive and rest 18 were culture negative. So whatever may be the case, positive culture is found in very less no of cases & negative culture is found in rest of the cases.

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Parameters	No. of Culture Positive Women	Percentage %
21-25 yrs	9	19.56
26-30 yrs	28	60.86
➢ 30 yrs	9	19.56
1st Trimester	14	30.43
2nd Trimester	22	47.82
3rd Trimester	10	21.73
Low Socio economic status	28	60.86
Middle Socio economic status	12	39.13
High Socio economic status	6	13.04
Table 4: Distribution of Culture positive women with respect to age, trimester and Socio-economic Status		

This table shows that, out of the culture positive cases it has been found that majority are in the age group of 26-30 yrs (60.80%) and in 2nd trimester of pregnancy (47.82%) and in women of low socio-economic class (60.86%).

Taking into consideration the culture positive cases a spectrum of bacterial isolate was done and the results were as follows.

Bacterial Isolate	Total No. of Culture Positive Women	Percentage %
E. coli	30	65.21
K. pneumoniae	6	13.04
P. Mirabilis	2	4.34
C. koseri	1	2.17
Pseudomonas	3	6.52
S. aureus	2	4.34
E. faecalis	2	4.34
Total	**46**	**100**
Table 5: Distribution of Culture Positive Women According to Spectrum of Bacterial Isolate		

This table shows that the incidence of organisms isolated in Bacteriuric cases, Escherichia coli was found as the major isolate constituting (65.21%), K. Pneumonia was the next major isolate constituting 13.04%, and Pseudomonas (6.52%). P. Mirabilis, S. Aureus and E. Faecalis each found in 2 cases (4.34%). C. Koseri isolated only in 1 case (2.17%). Thus Gram negative bacteria were found in 32 cases and Gram positive bacteria in 4 cases only.

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Table 6: Anti-Microbial Susceptibility of Gram Negative Organism.

Organism Isolated	Total No Isolated	Nitrofurantoin (100µg)		Cephalexin (30 µg)		Amoxycillin + Clavunate (30 µg)		Norfloxacin (10 µg)		Gentamycin (10 µg)		Nalidixicacid (30 µg)	
		S	R	S	R	S	R	S	R	S	R	S	R
E. coli	30	22 (80)	8(20%)	18(60%)	12 (40%)	18 (60%)	12 (40%)	15 (50%)	15 (50%)	16 (40%)	14 (53.33%)	9 (30%)	21 (70%)
K.pneumoniae	6	4 (66.7)	2 (33.33%)	3 (50%)	3 (50%)	4 (66.67%)	2 (33.35%)	2 (33.33%)	4 (66.67%)	2 (33.33%)	4 (66.67%)	1 (16.76%)	5 (83.34%)
P.mirabilis	2	2 (100%)	0(0%)	2 (100%)	0 (0%)	1 (50%)	1(100%)	0 (0%)	2 (100%)	1 (50%)	1 (50%)	0 (0%)	2 (100%)
C.koseri	1	1 (100%)	0 (0%)	1 (100%)	0 (0%)	1 (100)	0(0%)	0(0%)	1 (100%)	0 (0%)	1 (100%)	0 (0%)	1 (100%)
Pseudomonas	3	3 (100%)	0 (0%)	2 (66.67%)	1 (33.53%)	1 (33.53%)	2 (66.67%)	0 (0%)	3 (100%)	0 (0%)	3 (100%)	0 (0%)	3 (100%)
Total	42	32	10	26	16	25	17	17	25	19	23	10	32

This table shows, when sensitivity tests were done for different antibiotics, amongst Gram Negative bacteria isolated highest sensitive drug was found for Nitrofurantoin (80%) followed by Cephalexin (60%), Amoxyclav (60%) , Norfloxacin (50%) and Gentamycin (40%).

Table 7: Anti-Microbial Susceptibility of Gram Positive Organisms

Isolated Organism	Total No Isolated	Ampicillin		Gentamicin		Amoxycillin + Clavunate		Norfloxacin		Erythromycin		Ciprofloxacin	
		S	R	S	R	S	R	S	R	S	R	S	R
S.aureus	2	1 (50%)	1 (50%)	2(100%)	0 (0%)	1 (50%)	1 (50%)	0 (0%)	2 (100%)	2 (100%)	0 (0%)	2 (100%)	0 (0%)
E.faecalis	2	0(0%)	2 (100%)	0 (0%)	2 (100%)	0 (0%)	2 (100%)	0 (0%)	2 (100%)	0 (0%)	2 (100%)	2 (100%)	0 (0%)
Total	4	1	3	2	2	1	3	0	4	2	2	4	0

Out of Gram positive bacteria majority are sensitive to Ciprofloxacin and Erythromycin than Ampicillin, Gentamycin and Co- Amoxyclav.

DISCUSSION: In present study various symptoms occurring in symptomatic cases was also analysed with respect to age, parity, trimester and socio-economic status. In my study the incidence of UTI is more prevalent in the middle age group (26-30 yrs) i.e., 50% as compared to that in younger

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(31.25%) & older age group (18.75%). This is comparable to the study of Karuna et al,[1] who found a maximum symptomatic cases in age group 20 – 30 yrs.

Taking parity into consideration it was found on the present study that primigravida (69.56%) are more prone to bacteriuria during pregnancy than multigravida (26.09%). McFadyer S. J et al who showed higher incidence of bacteriuria in primigravida as compared to Multigravida, Lavanya SV,[2] in their study showed that (66.6%) cases were primigravida & only (16.6%) were multigravida. It has also been found in their study that women in 2nd trimester of pregnancy (60%) are most prone to Urinary Tract Infection than that in 1st (26.67%) & 3rd (13.33%) trimester of pregnancy.

The dominant isolate in the present study was E. coli, which was 65.20%. Others were K. pneumoniae, Proteus mirabilis, Pseudomonas. Spp, Staphylococcus aureus, E. faecalis which were found in less numbers. This is similar to the findings of previous studies by Khttak A. M,[3] Kass et al, Fatima N et al,[4] Isabel N l et al and Jayalakshmi et al.[5]

In present study Urinary tract infection present in more nos. in primigravida (69.5%). According to Ian Donald,[6] UTI is more common in primigravida than multipara. Little et al,[7] have found it to be more common in primigravida In present study asymptomatic bacteriuria was high (47.28%) amongst primigravida and during second trimester of pregnancy. Karuna T et al,[2] showed in her study that symptomatic bacteriuria is around 48% in primigravida and in first trimester and 58% in second trimester of pregnancy.

Also in my study antenatal women having illiteracy and from rural area have both symptomatic and asymptomatic bacteriuria is high percentage i.e., (63.13%) and (69.38%) respectively in comparison to women from urban area and from low literacy group. This has also been proved by Karuna T et al,[2] and Walley et al in their studies.

In the study, the antimicrobial susceptibility pattern of organisms isolated and tested antibiotics showed Nitrofurantoin as the most sensitive drug (80%) followed by Cephalexin (60%), Amoxyclav (60%), Norfloxacin (50%) Gentamicin (40%).

Norfloxacin pattern is comparable with other studies. Lavanya S. V et al,[1] showed in her study that organism were sensitive to Cephalexin 60%. Nitrofurantoin 80%, Amoxycilliin (60%), Norfloxacin (50%), Gentamicin (40%).

This sensitivity pattern is comparable with other studies. Lavanya S. V1 showed in her study that organism were sensitive to Cephalexin, Nitrofurantoin, Amoxycillin and Norfloxacin in decreasing order. Karuna T et al.[2] Also found in her study almost the same pattern of sensitivity. She found Nitrofurantoin as the most sensitivity drug (77.5%) followed by Cephalexin (67.5%), Amoxycillin (60%), Norfloxacin (52.5%), Gentamicin (47.5%) and Nalidixic Acid (25%).

CONCLUSION: - In present study, incidence of urinary tract infection both symptomatic and asymptomatic patients among pregnant women relating to isolation and identification with antibiogram was done. It was concluded that urinary tract infection is more common in asymptomatic women in pregnancy than symptomatic women. In this study E. coli was the most common pathogen isolated from culture positive cases (65.21%).

In this study most culture positive women were in the age group 26-30 years. Culture positivity was more in women in second trimester than that of first & third trimester. More common in women from low socio economic status than the women belonging to middle and high socio economic groups. Urine culture must be done at the first antenatal visit and repeated cultures should

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be obtained at different trimesters, because the urine of treated patients may not remain sterile for the entire pregnancy. Pregnant women should be treated when bacteriuria is identified with appropriate antibiotic therapy based on sensitivity test so as to avoid maternal-fetal complications.

Both Gram-negative and Gram-positive bacteria were isolated, but Coliform isolates were comparatively higher. Antibiotic sensitivity was tested as per Kirby- Bauer's techniques. A good response was seen to Nitrofurantoin, Cephalexin, Amoxyclav which can be used to treat bacteriuria in pregnancy.

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