



STUDY OF PREVALENCE OF BACTERIURIA IN ANTENATAL CASES ATTENDING KAMLA RAJA HOSPITAL

Dr Vrunda Joshi	Prof and Head of the department of Obstetrics and Gynaecology, Gajara Raja Medical College, Veer savarkar marg, Gwalior, Madhya Pradesh 474009
DR Niti Pandey	Junior Resident, department of Obstetrics and Gynaecology, Gajara Raja Medical College, Veer savarkar marg, Gwalior, Madhya Pradesh 474009
Dr Rajkishori Dandotiya*	Assistant professor, obstetrics and Gynaecology, Gajara Raja Medical College, Veer savarkar marg, Gwalior, Madhya Pradesh 474009. *Corresponding Author

ABSTRACT **INTRODUCTION:** UTI is the second most common medical complication of pregnancy with prevalence of bacteriuria 2-12%, which have serious complication for both mother and foetus. This study is therefore is aimed at finding out the prevalence of bacteriuria in pregnancy in our area and ascertaining methods to screen them and to formulate guidelines regarding prevention and treatment of bacteriuria. **AIMS AND OBJECTIVES:** To study the prevalence of bacteriuria in antenatal women attending Kamla Raja Hospital, Gwalior. **MATERIALS AND METHODS:** Present study conducted in the department of obstetrics and Gynaecology, Kamla Raja Hospital, G R Medical College, Gwalior from June, 2005 to October 2006, includes 200 randomly selected pregnant patients having symptoms or asymptomatic were tested for the presence of bacteriuria in urine. **RESULTS:** Prevalence of bacteriuria in present study has come out of 38.3%, prevalence of symptomatic bacteriuria is 43.47% and that of asymptomatic bacteriuria is 56.52%. Higher prevalence of asymptomatic bacteriuria (56.52%) is seen in 18-25 years (p value < 0.001). Of total of 144 patients with no history of instrumentation, 60 were found culture positive and 84 were found culture negative (p=0.045). Significant association has been found in patients with previous history of instrumentation and UTI (P-value < 0.001). **CONCLUSIONS:** The application of simple risk assessment appears to be simple for use in general practice. In resource constrained setting where the optimal and is not possible, some form of Syndromic management remain the only viable option for case management of symptomatic bacteriuria.

KEYWORDS : Asymptomatic bacteriuria, UTI, Syndromic manament.

INTRODUCTION:

UTI are common among women affecting half of all women at least once during their lifetime and it complicates 2-7% of all pregnancies. UTI is the second most common medical complication of pregnancy and without proper management may have a significant effect on the outcome of pregnancy. Despite the fact that most women with bacteriuria of pregnancy have a benign course, it has been clearly established that untreated bacteriuria can have serious complication for both mother and foetus. Approximately one third to one half of women with untreated infection progress to pyelonephritis. Besides, it has also been implicated as a risk factor for adverse perinatal outcomes like premature birth, low birth weight and perinatal deaths. In addition, association has been documented between antepartum UTI and a variety of maternal complication of pregnancy including hypertension, preeclampsia, anaemia, amnionitis and endometritis.

Prevalence of asymptomatic bacteriuria in pregnant women is approximately 3-10% if untreated 30-50% of these develop pyelonephritis. Apart from anatomical and physiological alteration of the urinary tract in pregnancy there are many risk factors predisposing to infection. Sexual activity is one of the significant risk factor. Nearly 75% of documented infection occurs within 24 hours of coitus. At present it seems safest to make a sweeping recommendation to screen all pregnant women and to treat bacteriuria when detected regardless of symptomatology of the patient.

Studies conducted in India suggest a prevalence of bacteriuria as 2-12% among pregnant women; that is slightly higher than that from the west. However, UTI in pregnancy has not been adequately studied in developing countries. This study is therefore is aimed at finding out the prevalence of bacteriuria in pregnancy in our area and ascertaining methods to screen them and to formulate guidelines regarding prevention and treatment of bacteriuria which may go long way in improving maternal and perinatal morbidity in terms of preterm labour, prematurity, PIH, sepsis, anaemia.

AIMS AND OBJECTIVES:

1. To study the prevalence of bacteriuria in antenatal women attending O.P.D. and indoor in Kamla Raja Hospital, Gwalior.
2. Prevalence of symptomatic and asymptomatic bacteriuria is found.
3. Association of bacteriuria with age, parity, anemia, mean gestational age, history of instrumentation in genitourinary area, method of contraception used, frequency of sexual intercourse and intake of water is found.

4. Type of organism and sensitivity to antibiotics is found.

MATERIALS AND METHODS:

This prospective randomized study has been conducted in the department of obstetrics and Gynaecology, Kamla Raja Hospital, G R Medical College, Gwalior from June, 2005 to October 2006. This study includes 200 randomly selected pregnant patients attending OPD/Indoor.

Inclusion criteria: All pregnant patients irrespective of Age, parity, period of gestation, having symptoms or asymptomatic were tested for the presence of bacteriuria in urine.

Exclusion criteria: Patients with anatomical and structural defects of urinary tract, chronic renal disease, chronic infections like TB/ chronic Malaria and taking treatment for the same, Patients not willing to participate in the study.

METHOD:

After selection patients is enquired about her age, period of gestation obstetric history; detailed history about the symptoms (fever, dysuria, lower abdominal pain, low backache) was taken, any surgical intervention in genital region, h/o contraception practiced, intake of water 1500ml or more per day, past medical or surgical history, drug history, H/o similar illness in the past was obtained and entered in individual data collection forms. After detailed clinical history patients were examined for fever, pallor, and a through systemic examination was done looking specifically for renal angle tenderness, suprapubic tenderness and pain at the urethral site and finding were recorded.

Patient was counseled and was explained about the collection of clean catch mid-stream sample of urine. Sample was taken in 2 sterilized bottles. One for routine microscopy and second is for culture sensitivity. As soon as the urine sample was collected it was sent to the laboratory within 2 hours of collections and in case of delay was kept in refrigerator at 4-8 degree Celsius.

Urine routine microscopy included physical, chemical, and microscopic examination of centrifuged deposit. Samples were seen for color, turbidity, and dip stick test done for pH, protein and sugar. This is indicated by specific color change from yellow green for protein (if protein more than 0.3-0.5g/24 hours) and blue green and brown for sugar. The pH change was read as acidic or alkaline. The reagent strip was read at specific time for one minute. A positive test

was defined as more than a trace of protein or sugar. After centrifuging for 3-5 minutes sediment was seen under microscope for erythrocytes, pus cells, epithelial cells, WBCs cast, RBC casts, waxy, hyaline cast and crystals. More than 3 pus cells per high power field were taken as significant.

For culture and sensitivity, one full loop of inoculum (0.004ml) using the sterilized calibrated loop, was inoculated on MacConkey's Agar and nutrient agar and incubated at 37 degree Celsius for 24 hours. The growth of organism noted the next day. A urine culture was defined as positive if the cultures showed significant bacteriuria (10 CFU /ml of urine or 400 colonies found after inoculated of 0.004ml of urine with dilution factor of 250).

A culture was defined as contaminated if there was a mixed culture of any density, or a pure culture of $\square 10^5$ CFU/ml. such cultures were repeated with another samples culture in which there was no growth of bacteria was classified as negative. If Mac Conkey shows pink colonies due to lactose fermentation, it implies growth of either E.coli/Klebsiella . E. coli colonies are pink smaller and Klebsiella larger pink colonies with mucoid appearance. If colonies are formed, but no pink color in Mac Conkey's agar it implies presence of non-lactose fermentus, i.e. either Pseudomonas or Proteus. In such case sample from growth in nutrient agar is taken and oxidase test was done. A purple appearance implies Pseudomonas, no purple color with fishy odour and swarming colonies implies Proteus and dry colorless colonies are seen with Streptococcus. After isolating organism antibiotic sensitivity was done by disc diffusion method, tested for ampicillin /gentamicin, norfloxacin, cefotaxim, ceftriaxone and ciprofloxacin and nalidixic acid.

RESULTS:

Prevalence of UTI in our study is 38.33% (69/180) which was found to be statistically significant (p value-0.001). Prevalence of symptomatic bacteriuria was found to be 43.47% and asymptomatic bacteriuria is 56.5% respectively.

Table-1

S.No	Parameters	Symptomatic	Asymptomatic	p-value	
1	Culture positive	30	39	0.001	
2	Culture negative	42	69		
3	Age group	<18	0	0	
		18-25	9	10	
		26-40	69	42	
		>40	0	0	
4	Mean gestational age	<12 weeks	0	0.05	
		12-28 weeks	48		36
		>28 weeks	54		36
5	History of instrumentation	Yes	24(13.3%)	0.045	
		No	54(30%)		90

In our study 50% of patients presented in 3rd trimester, 46.6% in second trimester and only 3.3% presented the 1st trimester. Of all presenting in 1st trimester 100% were found to be symptomatic. However those in 3rd trimester, 20% are symptomatic and 30% are asymptomatic (p-value 0.05). It suggest that duration of pregnancy has no significant association with the prevalence of bacteriuria, However it suggest that screening may be helpful 1st and 3rd trimester of pregnancy.

Of total of 144 patients with no history of instrumentation, 60 were found culture positive and 84 were found culture negative which was statistically significant (p-0.045) which suggests that if previous no history of instrumentation in genitourinary area chances of culture positivity is less thus indicates that any infection in close vicinity of urethra from vagina and perineum canaled to UTI.

Table-2

S.no	Parameters	Total no. patients(180)	Culture positive	p-value
1.	History of intercourse	Iper week	21	9
		>1 week	27	27
		No history	132	33
2	Contraception practiced	Barrier method	45	33
		OCP'S	15	3

	IUD'S	3	3	
		No method	117	30
3	Total leukocyte count	≤ 11000	132	27
		>11000	48	42

DISCUSSION:

UTI is the most common infection in pregnancy with prevalence of 2-10% as per many epidemiological studies. Urinary tract undergoes profound changes during pregnancy i.e. pyelocalyceal and ureteric dilatation and immunological change which make pregnant women more susceptible to symptomatic infection leading to serious maternal and fetal sequels. Prevalence of bacteriuria in present study has come out of 38.3%, prevalence of symptomatic bacteriuria is 43.47% and that of asymptomatic bacteriuria is 56.52%. This percentage of prevalence is much higher than the prevalence as mentioned in above quoted studies

The higher prevalence of symptomatic cases could be because of inclusion of nonspecific features like low backache and lower abdominal pain which ladies complain during pregnancy. Other variables relevant to question of prevalence of bacteriuria i.e age, parity, anemia, H/o instrumentation in genitourinary area method of contraception practiced, frequency of sexual intercourse, intake of water per day leukocytosis and leukocyturia were also assessed.

In our study significant relation with age is noted. Higher prevalence of asymptomatic bacteriuria (56.52%) is seen in 18-25 years and that of symptomatic bacteriuria (43.47%) in age group of 25-40 years which indicate that the burden of the problem lies in young and sexually active reproductive age group (p value< 0.001) . the results are much higher as compare to study performed by **Reddy J,Campbell A in Gisborne Newzeland** were the prevalence of ASB was found to be only (9.6%) with high prevalence in the younger women **Reddy J. Campbell A, Australia, NZ Obst. Gynecol, 1985.**

No relation of prevalence is seen with parity and anemia in our study. However study performed by Yashodhara P. Mathur et al – (UTI in pregnancy Indian journal Med Res. 1987; 86: 309-14) have shown that prevalence of bacteriuria rises with parity and severity of anemia.

Patients with history of instrumentation in genitourinary area found to be at significant risk for developing UTI. 58.3% of patients with positive history were found positive for culture **Leigh and Colleagues 1990** report a 34% rate of symptomatic bacteriuria in women after cesarean section). This suggests that any infection which is acquired in close vicinity to urethra from vagina or perineum will lead to increase chance of developing UTI.

Frequency of intercourse > 1per week was found to be significantly associated with prevalence of UTI suggesting coitus to be an important risk factor for developing UTI (P<0.01) same result were shown in following studies: 1. **Bandyopadhyay et al 2002** at civil dispensary, Chandigarh.

2. **Strom BL,et al1986-1987** sexual activity was found to be significant risk factor with multivariate adjusted odds ratio (95% confidence interval was found) IC in previous 48 hours (58.1%) IC in previous 3-7days (9.1%).

Out of all practice methods of contraception, barrier method was found to be significantly associated with prevalence of UTI (p-value \square 0.01). Result is consistent with the study at **clinical epidemiological unit ,University of Phildelphia** in which out of different practice methods of contraception, diaphragm use remain the only statistically significant risk factor when compared with other contraceptive methods (**REF- Aust,NZ,J.Obst.Gynaecol 1986,Aug 26(3),225-227**). This observation shows that barrier methods probably lead to breach to in normal vaginal epithelium thus increasing the chances of infection.

Patient with water intake of less than 1500ml per day were at 1.5 times increase risk of developing bacteriuria. Hydration has been long standing approach in therapy of UTI. Intake of fluid dilution of residual bacteria and removal of the infected urine by frequent bladder emptying which in the presence of minimal residual urine may offset the logarithmic growth of bacilli. Result are consistent with study by **Bandyopadhyay et al** which shows that 24 % of bacteriuria in study population could be prevented by intake of more than 1500 ml water/day.

Leucocytosis was found to be a significant predictor for developing UTI with 87.5% of patients found positive for culture (sensitivity 87.5%, specificity 79.5%, ppv 60.86%) leucocyturia (≥ 3 pus cells per high power field) was also found to be significant predictor for UTI. E.coli was the most common isolated organism in our study. In study conducted by Har Jains et al and Steensberg et al, E. coli was isolated in 84% and 70% cases respectively. Maximum sensitivity was seen with quinolones and gentamycin (40%) and maximum resistance was seen with ampicillin Har Jains et al showed 77% sensitivity for quinolones and Wiener J et al found 100% resistance to gentamycin. This shows sensitivity pattern varies widely in different geographical areas

SUMMARY:

UTI is the second most common medical disorders of pregnancy after anaemia complicates 5% of all pregnancies and associated with significant maternal and neonatal morbidity in terms of PIH, Sepsis, LBW, preterm labour and prematurity.

Out of 200 randomly selected patients 180 patients participated in study. Sixty nine patients were found to have significant bacteriuria ($>10^5$ /ml) prevalence found to be 38.33% prevalence of symptomatic bacteriuria 43.47% and prevalence of asymptomatic bacteriuria 56.52%. Rise in prevalence seen with increase in age 38.3% of patient in age group of 18-25 years and 61.6% in 26-40 years of age (P-value < 0.001). Majority of patients presenting with asymptomatic bacteriuria belongs to 18-25 years (p-value < 0.001) and those between 26-40 years of age have symptomatic bacteriuria (p-value < 0.001).

Significant association has been found in patients with previous history of instrumentation and UTI. Those having positive history have been found to be symptomatic (p-value < 0.001), 58.3% of patients were found culture positive and those with no history were found to be 41.66% culture positive. However the results are not found to be statistically significant in terms of culture positivity. No significant association was found in terms of parity, mean gestational age and anaemia.

Frequency of sexual intercourse was found to be statistically significant. Those practicing intercourse > 1 week were significantly found to have more chance of developing UTI as compared to those who practice infrequent intercourse (p < 0.05). Out of all practiced methods of contraception barrier method is found to be most significantly associated with UTI. IUCD are next to follow. OCP are not found to be significantly associated with UTI (p-value < 0.05). Intake of water is significantly associated with bacteriuria. Those taking < 1500 ml/day were found to be 60% positive for culture (p value < 0.001). Of all presenting symptoms LAP was most frequent followed by LB and dysuria and fever. Those presenting with fever and dysuria were found to be 100% and 50% positive for culture respectively. Leucocytosis has been found to be significant predictor for developing UTI with p value < 0.005 and PPV = 60.86%. Leucocyturia (> 3 pus cells/hpf) was found to be 68.9% sensitive and 90% specific with PPV 86.9% and NPV 24.3% in predicting UTI. E. coli was found to be most common isolated organism 100% in our study. Maximum sensitivity of E. coli was found for quinolones and gentamycin (40%) followed by cephalosporins. Maximum resistance was seen with ampicillin.

CONCLUSIONS:

To conclude it can be said prevalence of bacteriuria is common among pregnant women. Usual signs and symptoms are neither sensitive nor specific. However a combination of positive risk assessment plus constellation of symptoms give sensitivity specificity reasonable enough to warrant consideration for treatment of bacteriuria.

The application of simple risk assessment appears to be simple for use in general practice. In resource constrained setting where the optimal and is not possible, some form of Syndromic management remain the only viable option for case management of symptomatic bacteriuria.

Once screening has been done, they may be subjected to simple test like microscopic examination for leukocytosis. The presumptively treat must be made with full recognition and acceptance that a proportion of uninfected women will be treated unnecessarily. Where facilities are available, culture should be done on patients who are screened to be positive. This would serve both the purpose reducing unnecessary use of antibiotic and work load on laboratories.

Beyond the obvious problem of physical discomfort, increased level of depression, anxiety and sexual problem are often reported in women

with chronic UTI; which can seriously affect the quality of life of women. More so in pregnant women with increase the chances of PIH, anaemia, LBW, prematurity, and sepsis.

Self-measure and self-knowledge can go a long way in overcoming the burden of the problem, in view of high prevalence in our area recommend following, for prevention by increasing knowledge, attitude and practice:

1. Screening should be done in all patients in their 1st and 3rd trimester of pregnancy.
2. Drink plenty of water.
3. Frequent emptying of bladder and voiding before and after intercourse.
4. Avoid unnecessary instrumentation in genitourinary area.
5. Avoid using barrier contraception for prolonged period.

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