

INCIDENCE OF URINARY TRACT INFECTION DURING PREGNANCY

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Abstract: Incidence of Urinary tract infection was determined in 164 pregnant women presented at DHQ Teaching Hospital, Abbottabad. The cases with significant bacteriuria ($> 10^5$ organisms/ml of Urine) were 9.7% of total. 76% of the patients were less than 30 years of age with mean of 28 years. In the symptomatic group the frequency of UTI was 12.5% while in the asymptomatic group it was about 4.0%. Pyuria was found in 13.4% of the total cases. Albumin and Glucose in Urine were found to be 6% and 3% respectively.

The organisms isolated were E. Coli (56.3%) Staphylococcus (25.0%) Klebsiella Spp (12.5%) and proteus Spp (6.2%). Most of them were sensitive to Minocin, Gentamycin, Claforan, whereas the sensitivity to Amoxil, Dalacin, Fosfomycin and Doxycyclin was variable.

Introduction

Urinary tract infection (UTI) is common in females especially during pregnancy. Epidemiological studies of bacteriuria have demonstrated that colonization rates are quite high during the first trimester. Antimicrobial treatment of bacteriuria during early months of pregnancy will protect against more serious UTI during third trimester.

It is reckoned that in about 5% of all necropsies, pyelonephritis is a major contributory cause of death and some evidence of infection of the kidneys in post-mortem studies has been demonstrated. It is possible that a kidney once infected will never fully regain its function. Urine of pregnant women is a more suitable culture medium than that of non-pregnant women because its PH is usually higher, whereas lower PH or more acid levels will inhibit the growth of Esch. Coli.

Three recent studies suggest that bacteriuria may be an independent variable associated with increased mortality.¹⁻³

This study was aimed to find out the prevalence of urinary tract infection in pregnancy of our local population and its relation to symptomless bacteriuria and pyuria.

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Material and Methods

164 samples of Urine from pregnant women were collected from Obstetrics and Gynaecology ward and out patients of DHQ Hospital, Abbottabad.

A proforma was designed giving the details of subjects name, age, area, socio-economic status, gestational age, clinical observations and urine microscopical and bacteriological findings.

Random mid-stream urine was collected in sterile container with necessary precautions. The samples were processed within one hour after the collection. Each sample was tested chemically for presence of albumin, sugar and microscopically for the presence of WBCs, Crystals etc.

Standard platinum loop was used for the culture as described by Baker.⁴ 500 loopfulls of distilled water were discharged onto a preweighed piece of filter paper. The filter paper was reweighed and quantity of fluid per loop calculated. Leucocyte count was performed semiquantitatively by centrifuging 100 μ l of urine at 3000 RPM for 3-5 minutes, 9cc of supernatant was discarded and deposit resuspended in one ml of urine and examined microscopically. Leucocytes were averaged per high power field (HPF) and a W.B.C. count of <4/HPF was taken as normal.

One loopfull of well mixed uncentrifuged urine was inoculated onto blood agar and Mac-Conkey agar plates which were incubated at 37C for 18-20 hours. The number of colonies on blood agar were counted and calculated per ml of urine. Chemical analysis of urine sugar, albumin was determined by Diastix strip.⁵

The organisms were further identified by standard Bio-chemical tests. Agar diffusion method of susceptibility testing was performed on pure culture and sensitivity tested using commercially available antibiotic discs.⁶

Results

164 cases were examined in this study. Majority of patients (76%) were between 17-30 years of ages, 85% were of Urban and 15% of Rural origin.

40% of the total patients belonged to lower socio-economic group, 55% belonged to middle while only 5% had family incomes of more than Rs. 2,500 per month.

Chemical analysis of urine showed, albumin from trace to two plus in 6.1% urine sugar was detected in 5 (3%) and leucocyte count of >5/HPF was found in 22 (13.4%).

Out of the total, significant bacteriuria was found in 16 (9.7%). In Asymptomatic cases significant bacteriuria was 4% while in symptomatic group it was 12.5%. Renal pain/colic and lower abdo pain were the predominant symptoms (62%) in this group (Table-1). Overall incidence of pyuria was 13.4%, the frequency of bacteriuria increased with high WBC excretion, 25% in patients with 5-10 WBC/HPF and 80% in patients over 10 WBC/HPF (Table-2).

Out of 16 UTI positive cases, 9 cases had grown Esch Coli, 4 cases

staphylococcus, 2 cases Klebsiella while only one case had proteus (Table-3). 34 (20.8%) cases had mixed growth and their colony count was less than 10.5/ml, 114 (70%) had no growth. Most of the organisms were sensitive to Minocin, Gentamycin, Claforan, but their sensitivity to Amoxil, Ampicillin, Dalacin, Fosfomycin and Doxycyclin was variable (Table-6).

Discussion

The urinary tract is made further vulnerable to infection during pregnancy because the altered secretions of steroid sex hormones and the pressure exerted by the gravid uterus upon the ureters and bladder cause hypotonia and congestion and predispose to ureterovesical reflux and urinary stasis. We have found bacteriuria in 9.7% of 164 pregnant women. A similar finding has been reported by Davison.⁷ In asymptomatic cases significant bacteriuria was 4% whereas, in our previous study⁸ it was observed to be 2.7% in asymptomatic adolescent girls.

The high incidence of urinary tract infection in pregnancy is now viewed as an expression in part, of the accumulation of bacteria acquired earlier in life. There appears to be some change in urinary tract during the last trimester of pregnancy i.e. uterine size, dilation of ureters or other factor, that permits established bacterial colonization of the urine to lead invasion of the kidney.

A striking difference exists between the frequency of symptomatic infection and asymptomatic bacteriuria during pregnancy. Symptomatic urinary infection, particularly pyelonephritis, usually occurs during the third trimester of pregnancy.

UTI in pregnancy needs proper follow up. Additional 5% may develop UTI during/after parturition. Chronic pyelonephritis and hypertension in older age can follow recurrent UTI especially in successive pregnancies. By the time renal function tests are abnormal about 80% of renal parenchyma are permanently damaged. It is very difficult especially in our hospitals to follow up the cases and investigate the extent of disease. It is said that urinary infections demonstrate iceberg phenomenon in which greater part of disease lies below the clinical surface. Even with "successful" treatment a latent urinary infection may continue and the chances of developing overt UTI are more than doubled in pregnancy.

Urinary symptoms and pyuria are variable in degree in urinary infections. In the majority of acute cases they are present but they may be absent, especially in chronic infections of upper urinary system. Significant bacteriuria is a more reliable means of detection of UTI and may be found in absence of symptoms (12.5%) or pyuria (3.5%).

In conclusion this study confirms previous studies that UTI in pregnant women as judged by viable bacterial count may be present in absence of symptoms and pyuria. The physician involved in the management of these patients should take this into account and the fact that additional 5% may develop UTI during/after parturition. Adequate treatment and follow-up

should be carried out as far as possible to avoid immediate and long-term complications of this common infection.

Table 1
Signs and Symptoms of Patients with Sig. Bact.
Total: 16, Symptomatic 14, Asymptomatic 2.

Signs/Symptoms	No.	Percentage
Dysuria	2	12.5
Low Abdo. Pain	4	25.0
Strangury	2	12.5
Renal Pain	6	37.5
Asymptomatic	2	12.5
	16	100.00

Table 2
Relation of Pyuria with Significant Bacteriuria

No. of Pus Cells	No.	%	No.	%
0-4/HPF	142	86.6	5	3.5
5-10/HPF	12	7.3	3	25.0
10 +	10	6.1	8	80.0

Table 3
Type of Organisms in Positive Growth

Organism	No. of +Ve Cases	Percentage
E. Coli	9	56.3
Staphlococcus	4	25.0
Klebsiella	2	12.5
Proteus	1	6.2
	16	100.00

Table 4
Anti-Biotic Sensitivity Pattern (%)

Anti-biotic	E. Coli	Staph.	Klebsiella	Proteus
Amoxil	45	80	R	R
Ampicillin	45	80	50	R
Claforan	100	100	100	100
Cloxacillin	33	25	R	R
Erythromycin	33	70	R	R
Doxycyclin	55	50	R	R
Fosfomycin	33	75	R	100
Gentamycin	100	100	100	100
Minocin	100	100	100	100
Pyopen	66	70	100	R
Dalacin	55	75	50	R

REFERENCES

1. Dontas, A.S., Kasviki-Charvati, P. and Papanayiotou, P.C. Bacteriuria and Survival in old age. *M. Engl. N. Med.* 1981; 304: 939.
2. Evans, D.A., Kass, E.H. and Hennekens, C.H. Bacteriuria and subsequent mortality in women. *Lancet.* 1982; 1:156.
3. Platt, R., Polk, B.F. and Murdock, B. Reduction of mortality associated with nosocomial urinary tract infection. *Lancet*; 1983; 1:893.
4. Baker, F.J. *Hand Book of Bacteriological Techniques.* 2nd ed., Butter Worths & Gompany Ltd., London; 1967.
5. Free, A.H. and Free, H.M. *Urinalysis, Critical Discipline of Clinical Science* *CRS Crit. Rev. Clin. Lab. Sci.*, 3CW; 1972; 481:531.
6. Shank, C.R., Guguid, J.P. and Marmion, B.P. *Medical Microbiological* Vol. II, 12th ed., Churchill Livingstone, London; 1975.
7. Davison, J.M., Sprott, M.S. and Selkon, J.B. The effect of covert bacteriuria in school girls on renal function at 18 years and during pregnancy. *Lancet*; 1984: ii, 651.
8. Khaliq, M.A., Khan J.A. and Shaheen, P.K. and Farida, A. Bacteriological study of Urinary tract infections in healthy school going children of Hazara. *Pak. J. Med. Res.* 1986; 25: No. 1:27.