

Study of Asymptomatic Bacteruria in Pregnancy- Hospital Based Study

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Abstract

Background: Urinary tract infection(UTI) including asymptomatic bacteriuria, cystitis and acute pyelonephritis are the most common bacterial infections encountered during pregnancy. Women are at increased risk of UTI because of several altered factors during pregnancy and postpartum period.

Aims and Objectives: The main objectives of the study is to assess the prevalence of asymptomatic bacteriuria and to identify the type of organism causing bacteriuria, their sensitivity to antibiotics, its relation to parity and gestational period.

Materials and Methods: This study was conducted at Government Maternity Hospital - Upgraded institute for Obstetrics and Gyneacology, Nayapool Hderabad between May 2004 and October 2004. All women who attended the antenatal clinics of this hospital were taken as study group. Midstream urine sample was collected from 300 asymptomatic pregnant women and were processed. Urine culture was done by standard procedure and results were statistically analysed.

Results: In our study, the incidence of asymptomatic bacteriuria was found to be 6.3%. The organisms isolated were E. coli, Proteus Mirabilis, Klebsiella Pneumonia and Staphylococcus. Escherichia coli was the commonest organism which was isolated in 63.16% of cases. Out of the 300 samples, 19 samples were culture positive with pure growth of micro organisms with a colony count of > 10 /ml of urine. The organism isolated was E Coli, Proteus Mirabilis, Staphylococcus and Klebsiella pneumonia.

Conclusions: Asymptomatic bacteriuria is the major risk factor for developing symptomatic urinary tract infection and are associated with significant maternal and foetal risks. Hence any acute infection of the urinary tract during pregnancy require immediate diagnosis and therapy and if untreated the disease may ascend and cause serious complications.

Key words: Urinary tract infection, Asymptomatic bacteriuria, Pregnancy.

I. Introduction

Asymptomatic bacteriuria may be defined as the presence of actively multiplying bacteria somewhere within the urinary tract, excluding the distal urethra, at a time when patient has no urinary tract symptoms. 20 to 40% of pregnant women with asymptomatic bacteriuria detected in the 1st trimester will develop Acute Pyelonephritis, if untreated and this inturn results in substantial risk of prematurity and perinatal morbidity.[1] Immediate diagnosis of asymptomatic bacteriuria by standard culture method helps in reducing further complications. In pregnancy UTI seems to be isolated episodes and as they apparently respond to treatment their evolution received less attention than it deserves.[1,2]

II. Aims And Objectives

The main objectives of the study is to assess the prevalence of asymptomatic bacteriuria and to identify the type of organism causing bacteriuria, their sensitivity to antibiotics, its relation to parity and gestational period.

III. Materials And Methods

The study population consisted of pregnant women attending antenatal clinics at Government Maternity Hospital – Upgraded Institute for Obstetrics and Gyneacology, Nayapool, Hyderabad between May 2004 and October 2004. Clean-catch midstream urine specimen was collected from 300 patients in sterile containers. All the specimens were processed by standard procedure. Urine was collected only from asymptomatic patients. Absence of symptoms like pyrexia, polyuria, dysuria, haematuria, backache and renal angle tenderness were taken as asymptomatic of the bacteriuria when present. These patients were selected at random. The term of pregnancy varied from 12 to 32 weeks of gestation. Severely anaemic patients, patients with blood pressure of more than 128/80 and oedema feet and those associated with other medical problems

were not included in this study. A detailed history including history of previous urinary tract infection was taken in detail from each patient and was recorded in a proforma . A preliminary haemoglobin estimation was done for all patients. With the collected urine samples, before proceeding to culture, microscopic and chemical examination of urine was done to look for albumin, sugar, pus cells and bacteria. Collection of specimen : This was done by clean catch method. The patients were first explained, how to collect mid- stream,specimen of urine. The specimens were collected in the out- patient clinic of the hospital in sterile containers. The containers were immediately transported to the laboratory without any delay. Catheterisation was avoided to eliminate infecting the patient.

Examination of specimen: A portion of the specimen was set aside for culture and with the remaining sample, first chemical examination was done for the presence of albumin and sugar. Then with the remaining portion of the sample after centrifugation microscopic examination was done to look for pus cells,casts,RBC's and bacteria. Culture was then performed by the Standard procedure.

Standard culture method: This was done by a semi- quantitativemethod with a standard inoculating loop of 3.26mm diameter. 0.004ml of un-centrifuged urine was picked up and spread over blood agar and the same was spread over Mac conkey- Agar. The inoculation was spread thoroughly to give a well. Then parallel lines were made from the well making primary, secondary and tertiary lines and then tailing off.The loop was sterilised in between the strokes.

The plates were then incubated. After overnight incubation inoculated plates were examined for growth. The number of colonies estimated on the "weight" of confluent or semi confluent growth on the different sectors of the plates. This number was used to calculate the number of viable bacteria/ml of urine. Thus 0.004ml of urine yields about 400 colonies and the count/ml will be 1 lakh. This is taken as significant bactiruria.Anything less than that is taken as insignificant bactiruria.

Identification of organism: This was done by their staining, morphological, cultural and growth characteristics. The organisms isolated were Escherichia coli, Proteus mirabilis, Psedomonaspyocyanace, Streptococcus fecalis(Enterococcus), and Staphylococcus.

In our study the antibiotic sensitivity was performed by disc diffusion method. The antibiotics used in our study were Ampicillin, Gentamycin, Amikaci.,Cefetoxime, Nalidixic acid, Ciprofloxacin and Norfloxin. The degree of sensitivity followed by us is follows:

- 0 Resistant Diameter <9mm
- + Weakly sensitive Diameter 9---12mm
- +++ Moderately sensitive Diameter 13---17mm
- ++++ Highly sensitive Diameter > 17mm

In our study most of the organisms were sensitive to Gentamycin, Ciprofloxin and Norfloxinand the sensitivity varied from person to person.

IV. Results

The results obtained after this study were statistically analysed. A total of 300 urine specimens were obtained from pregnant patients who were between 10—32 weeks of gestation. Of the 300 urine specimens, the routine traditional culture method showed 19 samples to be culture positive with pure growth of micro organisms with a colony count of . 10 /ml of urine. Colony count with < 10 /ml was taken as insignificant bactiruria and was discarded.Acorrelation was made between the incidence of bactiruria with the age of the mother, parity and gestational age.In the present study the incidence of asymptomatic bactiruria was found to be 6.3%. Of all positive cultures, Escherichia coli was the commonest organism, which was isolated in 63.16% of cases.

Table1: Age distribution of cases (n=300)

Age of the mother in years	Total number of cases	No of culture positive cases	Percentage
15--19	55	3	15.79
20--24	104	8	42.11
25--29	93	5	26.32
30--34	30	2	10.53
35--39	15	1	5.26
40 >	3	0	0.00
Total	300	19	100 %

The age did not have any appreciable influence on the incidence on the incidence of asymptomatic bacteruria.

Table 2: Distribution of cases according to parity (n=300)

Parity in years	Total cases	No. of positive	Percentage
Primi	56	2	10.53
Gravida I	82	4	21.05
Gravida II	68	4	21.05
Gravida III	55	5	26.32
Gravida IV	39	4	21.05
Total	300	19	100.00

10.53% of primigravida gave positive culture and 26.32% of multigravida gave again positive cultures, which is twice that of primigravidas. This clearly shows that multigravidas were affected more than primigravida.

Table 3: Positive culture in relation to gestational age (n=300)

Gestational age in weeks	Total number of cases	Number of positive cases	Percentage
10--19	38	1	5.26
20 --24	102	8	42.11
25---28	69	7	36.84
29---32	68	3	15.79
Total	300	19	100.00

The incidence of asymptomatic bacteruria in relation to the period of gestation . Most of the antenatal cases do not come for check up before 20 weeks. Hence only a small number was available for our study. The maximum incidence in this study was found to be between 20-28 weeks of gestation.

Table 4: Microbiologic isolates in patients with Asymptomatic bacteruria (n=19)

Organism	No. of positive cases	Percentage
Escherichia Coli	12	63.16
Klebsiella pneumonia	3	15.79
Proteus mirabilis	2	10.53
Staphylococcus	2	10.53
Total	19	100.00

Table 4 shows that E.coli appeared to be the most common pathogen, as it was isolated in 63.16% of cases in our study. The other pathogens in order of frequency were K. pneumonia, Proteus Mirabilis and Staphylococcus.

V. Discussion

Asymptomatic bacteriuria is defined as the presence of actively multiplying bacteria somewhere within the urinary tract excluding the distal urethra at a time when patient has no urinary tract symptoms (Hankins & Whalley 1985). [3]. Although the risk of pregnant women developing asymptomatic bacteriuria developing symptomatic urinary tract infection is well established, the relationship of asymptomatic bacteriuria and symptomatic urinary tract infection remain an area of continuous debate. Many complications of pregnancy have been attributed to urinary tract infections during gestation including , Preterm labour, Low birth weight and Growth retardation. Other associations such as the role of bacteriuria in Hypertention during pregnancy and Anemia are less clear.

The initial studies of Kass in 1960 [4] clearly demonstrated that from 20—40% of women with bacteriuria who are detected early in pregnancy and not treated will develop acute pyelonephritis later in pregnancy . On the contrary only 1—2% of women seen early in pregnancy and found not to have bacteriuria at that time, develop symptomatic urinary tract infection later. Many studies have confirmed the association between pyelonephritis and an increased incidence of preterm labour and prematurity and have shown that successful treatment of bacteriuria early in pregnancy prevents acute pyelonephritis which in turn prevents prematurity and preterm labour. Although most studies have not supported those initial observations, some have. Thus the issue remains unsolved. Asymptomatic bacteriuria is only one factor in the complex issue of prematurity. Similarly the other complications of pregnancy reported to be associated with bacteriuria such as anemia and hypertention are also not very well established. Not all women at risk for symptomatic infection will be detected by a screening culture. Screening and treatment of bacteriuria will eliminate a small but definite number of symptomatic infections and the complications that follow. Therefore screening culcers are recommended for all women early in pregnancy.

Prevalence of asymptomatic bacteriuria was reported in 6.3% in our ante natal population using the traditional culture method. Based on the standard techniques, its prevalence reported in the literature is 6% with a range of 2---11% [5] and depends primarily on the socio economic status of the women surveyed. As our study group belonged to mainly low socio economic status the incidence correlated well with that of

[6]which was 6—10%.Among the causative organisms E.Coli was isolated in as high as 63.16% of cases. It is the most frequently isolated organism followed by klebsiella pneumonia, proteus mirabilis and others in small numbers. These findings also coincided with the study done by Kass et al [4].Age did not have any influence on the incidence of asymptomatic bacteriuria but parity did have. Multigravida were affected more than primigravida which to an extent corroborates with the findings of Van Dorsten et al[5]. The maximum incidence of bacteriuria was found between 20—28 weeks of gestation which may be due to the anatomical changes, atony dilatation and kinking of ureters brought about by the presence of enlarged uterus or due to hormonal influence. Another important finding in our study was the presence of past history of urinary tract infection in 13 out of the 19 positive cases which accounts to about 58.4% of the cases. Although past history of urinary tract infection was found to be more common in bacteriuric patients, it is not possible to identify accurately, a sub population at risk on that basis alone. Hence all patients with a past history of urinary tract infection should also be screened compulsorily during present pregnancy.

VI. Conclusions

Prevalence of bacteriuria in our population was found to be 6.3%. The commonest organism causing bacteriuria was found to be Escherichia coli amounting to 63.16%. The prevalence was more in multigravida than in primigravida. The highest incidence in relation to gestational age was found between 20—28 weeks of gestation in our study.

Although the impact of asymptomatic renal infection on ultimate pregnancy outcome is minimal, the need for screening and eradication of asymptomatic bacteriuria in order to prevent pyelonephritis cannot be minimised.

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