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Bacteriuria and Pregnancy Outcome: A Prospective Hospital-Based Study in Pakistani Women

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Abstract

The prevalence of bacteriuria in Pakistani women and its association with complications of pregnancy was studied. Out of 1579 women, 77 had bacteriuria (4.8%). There was no association of age, gravidity, parity, haemoglobin, pre-eclampsia, mode of delivery, gestational age at delivery, preterm delivery and low birth-weight with presence of bacteriuria. With detection and treatment the pregnancy outcome of women with bacteriuria in pregnancy was the same as that of those without (JPMA 44: 12, 1994).

Introduction

Bacteriuria (bacteria exceeding 10^5 colony of a single organism per ml) is a common complication in pregnancy. Its prevalence ranges between 2-1 1%[1]. If left untreated it is associated with maternal complications like pyelonephritis of pregnancy and subsequent chronic renal disease and perinatal complications like low birth-weight and preterm delivery[1-3]. Screening for bacteriuria and resultant urinary tract infection in all prenatal women has been recommended[4,5]. The evidence of efficacy of treatment is strong as several randomized trials have shown reduction in incidence of deleterious effects of undetected disease[6,7]. The data on optimum frequency of testing and the most appropriate test (urinalysis, dipstick, dipslide, culture) for screening is inadequate, leaving the choice to the clinician's discretion. Pregnancy outcome in women with bacteriuria has not been studied in Pakistani women. Its prevalence may be influenced by local hygienic practices and ambient factors affecting renal tract and its disorders. We carried out a prospective study to determine the prevalence of bacteriuria in pregnant women attending our antenatal clinics and to study its effect on perinatal outcome.

Subjects and Methods

A study was conducted in the obstetrics division of the Aga Khan University Medical Centre, Karachi during 1988-1990. All women presenting for antenatal care gave a midstream clean-voided urine specimen in a sterile screw capped container for culture/sensitivity and urinalysis at the initial visit irrespective of gestational age. Urine specimen were cultured within an hour of collection. In case this was not possible, the specimens were refrigerated at 4°C for up to 24 hours without any preservative. Each specimen was cultured in cystine lactose electrolyte deficient (CLED) agar plates by a 4mm diameter calibrated loop method and incubated at 3 7°C. After 24 hours colony forming units were counted for the presence of significant bacteriuria. One hundred colonies of a single type of organism (103 colonies/mI) were considered significant. Gram negative rods were identified by using API2OE strips (Analytical Products Inc., Carle Place, NY 11514). Gram positive colonies were identified by standard techniques. Antibiotic sensitivity testing was performed using Kirby Bauer method[8]. The results were available for review 3 days after submission of specimen. If an infection was detected, the patient was treated according to antibiotic sensitivity. All patients had urine dipstick examination

(Bayer Diagnostics Aust. Pry. Ltd., 500 Wellington Road, Mulgrave, Vic.) on each antenatal visit to check for pyuria and nitrite reduction as a guide for retesting urine for culture. Urine culture for bacteriuria were also repeated after completion of therapy in cases of infection or if symptoms of urinary tract infection appeared in all other cases. All patients were followed throughout their gestation and delivery. Patients with repeated urine infections were advised complete workup of urinary tract 6 weeks after delivery. Women with no growth on urine culture constituted the control group for cases with bacteriuria. The variables studied were age, gravidity, parity, gestation at initial testing, haemoglobin, pre-eclampsia, mode of delivery gestation at delivery and neonatal weight. The data were analyzed with statistical package for social sciences[9] (SPSS/PC +) using chi-square test and students' t test for comparison of proportions and means respectively. A P value of c 0.05 was taken as significant.

Results

Out of 1597 women studied, 77 (4.8%) had bacteriuria.

Table I. Mean age, gravidity, parity and gestational age in relation to presence or absence of bacteriuria.

Subject	Bacteriuria	No bacteriuria	All subjects
n	77	1520	1597
%	4.8	95.2	100
Age (years)			
Mean ± SD	26.3±5.1	27.0±4.8	26.9±4.8
Gravidity			
Mean ± SD	2.7±2.3	2.4±1.6	2.5±1.6
Parity			
Mean ± SD	1.2±1.8	1.2±1.3	1.2±1.3
Gestational age at initial testing (weeks)			
Mean ± SD	16.5±12.4	17.3±9.9	17.3±10.1

No difference between groups ($p > 0.05$).

Table I shows the mean age, gravidity, parity and gestational age at initial testing for bacteriuria of all subjects and of those with/without bacteriuria. There was no association between these parameters and the presence of bacteriuria. The mean gestational age at screening was 17.3± 10.1 weeks.

Table II. Pregnancy outcome according to presence or absence of bacteriuria.

	Bacteriuria (n = 77)	No bacteriuria (n = 1520)	All subjects (n = 1597)
Pre-eclampsia			
No. (%)	6 (7.8)	58 (3.8)	64 (4.0)
Haemoglobin (gm/l)			
Mean ± SD	11.5±1.3	11.5±3.6	11.5±3.5
Preterm delivery (<37 weeks)			
No. (%)	7 (9.0)	125 (8.2)	132 (8.2)
Gestational age at delivery (weeks)			
Mean ± SD	38.5±1.7	38.7±1.8	38.7±1.8
Mode of delivery			
No. (%)			
Spontaneous	45 (57.1)	999 (65.7)	1044 (65.2)
Forceps	20 (26.0)	319 (21.0)	339 (21.3)
Caesarean	13 (16.9)	202 (13.3)	215 (13.5)
Birth-weight (kg)			
Mean ± SD	3.0±0.4	3.1±0.4	3.1±0 .4
Low birth-weight*			
No. (%)	5 (7.1)	57 (4.1)	62 (4.2)

No difference between groups ($p > 0.05$).

*< 2.5 kg at term i.e., 37-41 weeks gestation; bacteriuria n = 70; No bacteriuria n = 1395

Table II shows the mean haemoglobin at booking, gestational age at delivery and birth-weight together with prevalence of pre- eclampsia, caesarean delivery, preterm delivery and low birth- weight in all subjects and those with/without bacteriuria. Preterm delivery and low birth-weight were not associated with presence of bacteriuria.

Discussion

The variations in the prevalence of bacteriuria may be related to the hygienic practices of the population screened or the rigor of the screening programme. Ablution after micturition and defecation, commonly practiced by Muslim women, may have a protective effect against the development of bacteriuria. Screening may be carried out with urinalysis followed by urine culture on detection of pyuria/nitrite reduction[5] but such screening has poor sensitivity and specificity[10]. We used the most accurate test for bacteriuria, urine culture, in order to have an unbiased assessment. In our series the prevalence of bacteriuria in pregnancy was 4.8%. This figure falls within the 2-10% range of the prevalence of this problem quoted in recent epidemiologic studies[6]. This figure is also close to that reported in Muslim women screened during pregnancy[11,12] as well as in non-pregnant state[13,14]. The former supports that the practice of ablution does not contribute to reduction in prevalence of bacteriuria and the latter supports that pregnancy itself may not be a significant risk factor for development of bacteriuria. Long term studies suggest that pregnancy screening may simply be

detecting women with chronic infections since childhood[15]. However, bacteriuria in pregnancy rarely remits spontaneously and often progresses to pyelonephritis[1], preterm delivery and low birth weight[3] as opposed to non-pregnant state where such problems are not encountered. Pre-eclampsia and anaemia have been associated with bacteriuria in pregnancy but we did not find any such association. In studying the association of bacteriuria in pregnancy with poor perinatal outcome, we did not find any difference in incidence of preterm delivery and low birth-weight in the two groups ($P>0.05$). There are many' factors other than bacteriuria associated with preterm delivery and low birth weight[6] which could have influenced these results, but we were unable to study their effect as these data were not collected, As described in methods, we provided therapy and close monitoring to all patients with bacteriuria. Hence, it is likely that the lack of association is due to provision of adequate treatment. To establish the association of bacteriuria with poor pregnancy outcome and the effect of therapy on the association, one would have to conduct a randomized trial in which some subjects are allocated to no therapy or placebo group.

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