



Original Article

Asymptomatic Bacteriuria during Pregnancy: Causative Agents and Their Sensitivity in Rajshahi City

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Abstract

This was a cross-sectional study conducted among the pregnant mothers of 2nd trimester in the metropolitan area of Rajshahi city. Total 2000 apparently healthy pregnant mothers were selected by random sampling with the view to estimate the prevalence of asymptomatic bacteriuria in apparently healthy pregnancy, its causative agents and their sensitivity pattern in the Rajshahi city. These 2000 pregnant mothers were selected from 20 wards by applying 2-stage random sampling. Two consecutive morning midstream urine samples were collected for culture and sensitivity test. The prevalence of asymptomatic bacteriuria in the rural Rajshahi was 14.5%. E.Coli was the commonest causative bacteria (94.83%). The urinary pathogens causing asymptomatic bacteriuria in pregnancy in the Rajshahi city were resistance to amoxicillin, cephalixin and cephadrine, moderately sensitive to doxycycline and highly sensitive to ciprofloxacin, gentamicin, nitrofurantoin and nalidixic acid. Screening of asymptomatic bacteriuria in pregnancy must be considered as an essential part of antenatal care like routine checkup for albumin and sugar in urine in this city community.

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Introduction

Incidence of asymptomatic bacteriuria in pregnancy is very common in Bangladesh¹. Among the healthy mothers attending at the institute of Post-graduate Medicine and Research, 30% had asymptomatic bacteriuria². In rural Rajshahi, 24% of the pregnant mothers were suffered from bacteriuria among them 12% were asymptomatic³.

Asymptomatic bacteriuria in pregnancy may lead to less favorable pregnancy outcomes and complications like preterm delivery, low birth weight, pre-eclamptic toxemia and anemia of pregnancy⁴⁻⁶. So, they must always be screened

and treated^{4, 6}. But it is not practiced in Bangladesh, screening of asymptomatic bacteriuria in pregnancy is not considered as an essential part of antenatal care like routine checkup for albumin and sugar in urine. In some cases, it is generally done only in the first visit of antenatal care. The necessity and benefit of this strategy is depending on the prevalence of asymptomatic bacteriuria in the population⁶. There is scarcity of reliable estimates about the prevalence of asymptomatic bacteriuria in Bangladesh.

The bacteria with their sensitivity to various antimicrobial agents vary from place to place and in the same place from time to time⁷. Although

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understanding of the pathogenesis of bacteriuria has improved, selection of an appropriate antibiotic has become complex for increasing incidence of resistant pathogens⁴. The emergence of resistant strains to most frequently used antibiotics such as ampicillin, amoxicillin has been reported in many studies^{7, 8}. Newer antimicrobial agents are being added to the list of drugs used in bacteriuria. For appropriate treatment and to avoid over-treatment that would increase both costs and incidence of side effects, it is need to stay abreast of information about the pathogens causing bacteriuria and their sensitivity and resistance pattern⁴.

The aim of this study was to estimate the prevalence of asymptomatic bacteriuria in pregnancy, and its etiological agents and their sensitivity pattern in the metropolitan areas of Rajshahi city.

Materials and methods

The study was a cross-sectional study conducted in the metropolitan areas of Rajshahi district. Apparently healthy pregnant mothers (without any symptoms of urinary tract infection (UTI)) of 2nd trimester at the time of interview will constitute the study population. A total of 2000 apparently healthy pregnant mothers were selected by random sampling. This 2000 apparently healthy pregnant mothers were be selected from 20 wards out of 30 by applying 2 - stage random sampling. In the first stage 20 wards, will be selected from the 30 wards of Rajshahi metropolitan area randomly. Household was second stage unit. In each ward starting point (house) was chosen one whose door was closest to the Ward Commissioner Office. Then every house with an apparently healthy pregnant mother of 2nd trimester was chosen to complete the total number of 100. Ten data collectors (interviewers) were made 5 teams of one male and one female for data collection. Each team was deployed for data collection of 4 wards. Reaching the selected ward, data collectors began to visit the houses according to the pre-selected manner to search apparently healthy pregnant mothers. After getting the desired mothers, data collectors built up rapport with them and a

sterile wide mouthed test tube was supplied to each of the mothers and requested them to collect their early morning midstream urine in the next day. In the following day during collection of first urine sample, data collectors supplied another sterile test tube for the 2nd day early morning urine sample. By this way two consecutive early morning midstream urine samples of the mothers were collected for routine and culture examination. The collected urine samples were sent to the laboratory as early as possible not exceeding 2 hours after urine collection. In the laboratory, collected urine samples were inoculated in MacConkey's agar media and Nutrient agar media, and incubated at 37⁰ C for 24 hrs. If any sample showed significant growth (colony count >10⁵ per ml of urine) of *E. coli*. And growth of others bacteria then identification test (biochemical test method) and sensitivity was done by stroke method. Data were processed using SPSS for windows.

Results

A total 2000 apparently healthy pregnant mothers were screened, 290 (14.5%) mothers were found to have asymptomatic bacteriuria. *Escherichia Coli* was the commonest organism (94.83%). Other causative agents of the asymptomatic bacteriuria were *Proteus* spp (3.45%) and *Klebsiella* spp (1.72%).

Table - 1: Sensitivity pattern of organisms causing asymptomatic bacteriuria in the urban pregnant mothers of Rajshahi (in percentage).

Antimicrobial	Causative bacteria		
	<i>E. Coli</i> n =275	<i>Klebsiella</i> n =10	<i>Proteus</i> n = 5
Ciprofloxacin	100.00	100.00	100.00
Gentamicin	100.00	100.00	100.00
Nitrofurantoin	81.09	90.00	80.00
Nalidixic Acid	83.63	100.00	80.00
Doxycycline	63.61	60.00	40.00
Cephalexin	14.53	0.00	0.00
Cephradin	7.34	0.00	0.00
Amoxicillin	0.00	0.00	0.00

Ciprofloxacin, gentamicin, nitrofurantoin and nalidixic acid were sensitive to the isolated organisms $\geq 80.00\%$ cases. Doxycycline was moderately sensitive to 40.0% to 63.61% of the isolated organisms. Cephalexin and cephradine were sensitive to the organisms ranging from 0.00% to 14.53% only. Amoxicillin was resistant to the all isolated organisms causing asymptomatic bacteriuria.

Discussion

The prevalence of asymptomatic bacteriuria was 4% -7% of pregnant mothers in studies from North America, the UK and Australia⁹. Bailey¹⁰ reported a 18.5% prevalence among pregnant Maori women in a study in New Zealand. In Bangladesh, Khatun et al.² in their study it was observed that 30% of clinically healthy pregnant mothers attending at the institute of Post-graduate Medical and Research had asymptomatic bacteriuria. In a recent study by Ullah et al. (2001)³, it was found that 12% of the rural mothers of Rajshahi district were suffering from asymptomatic bacteriuria. The results of the present study also indicated that asymptomatic bacteriuria during pregnancy is also an alarming health problem (14.5%) in the Rajshahi city.

Detection of asymptomatic bacteriuria in pregnancy is important. Screening in pregnancy for asymptomatic bacteriuria and treatment with antibiotics of positive cases is widely recommended¹¹. Recent reviews have discussed the morbidity in pregnant women if asymptomatic bacteriuria is not treated¹². For example, treating asymptomatic bacteriuria in pregnancy decreased the subsequent incidence of symptomatic bacteriuria 80% - 90%^{13,14}. The Canadian National Task Force on Preventive Health Care and the American College of Obstetricians and Gynecologists recommend screening urine cultures to detect asymptomatic bacteriuria during pregnancy as a routine basis^{15,16}. But some authors^{17,18} differ with it, they suggested to consider the existing prevalence of the asymptomatic bacteriuria of a particular population. They opined that it was worthwhile or cost-effective where the prevalence of

asymptomatic bacteriuria was $>9\%$. The estimated high prevalence of asymptomatic bacteriuria among the pregnant mothers of urban Rajshahi suggested that it will be very much worthwhile and cost-effective to screen the pregnant mothers for asymptomatic bacteriuria.

In this study, isolated pathogens were *E. coli*, *Proteus* spp and *Klebsiella* spp. *E. coli* account for approximately 95%. It was consistent with the findings of Khatun et al.(1999)¹⁹. The results of this study indicated that the pattern of isolated pathogens causing asymptomatic bacteriuria was the same as symptomatic bacteriuria even in pregnancy^{3,7,8}.

The sensitivity patterns of pathogens causing bacteriuria were changed day by day. During the last decade, though amoxicillin compromised by widespread bacterial resistance but it was sensitive in few cases (approximately 20%)^{4,8}. But in this study amoxicillin 100% resistant to the organism causing asymptomatic bacteriuria. Ahamed et al.⁷ in 1996 and Rahman et al.⁸ in 1990 in their study observed that urinary pathogens were sensitive ranging from 65 to 85% to cephalexin, cephradine, and doxycycline. But in this study they were not so sensitive to the respective antibiotics as like before. Like other studies^{3,7,20}, the findings of this study also indicated that comparatively less frequently used antibiotics, like gentamicin, nitrofurantoin and nalidixic acid were highly effective against urinary pathogens.

Government and NG health care organizations should take care about asymptomatic bacteriuria in pregnancy in the metropolitan area of Rajshahi city. Screening of bacteriuria in pregnancy must be considered as an essential part of antenatal care like routine check up for albumin and sugar in urine. Health care providers and the pregnant mothers of the city should be aware about this problem and motivate them to take care about it. It is better to treat all the patients with asymptomatic bacteriuria in pregnancy after culture and sensitivity test. If culture and sensitivity test is not possible, health care providers should consider nitrofurantoin as a first line of drug to treat the suspected case of bacteriuria in pregnancy considering the toxic effects on the foetus.

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