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FREQUENCY OF ASYMPTOMATIC BACTERIURIA IN PREGNANT WOMEN

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Abstract

Background: Asymptomatic Bacteriuria (ABU) among pregnant women stands as a notable health concern that, regrettably, frequently escapes thorough scrutiny, demanding a meticulous exploration.

Objective: The objective of this research was to determine the frequency of Asymptomatic bacteriuria in pregnant women

Material and Methods: A Cross-Sectional Survey was carried out at the Department of Obstetrics & Gynecology, Jinnah Post Graduate Medical Centre in Karachi over a six-month period, from July, 2021, to January, 2022**.** A total of 241 pregnant women who met the inclusion criteria were included in the study. Randomly voided, clean-catch midstream urine samples (30–50ml) were collected in sterile wide-mouth containers (100ml) with covers for culture. Contamination was considered present if the urine culture revealed more than one type of organism. Subsequently, the urine culture was repeated after seven days.

Results: The average age of patients was 27.4 ± 7.3 years. Among the 241 women screened for asymptomatic bacteriuria, 17 (7.1%) tested positive, while 224 (92.9%) tested negative. Escherichia coli was identified as the most prevalent organism responsible for asymptomatic bacteriuria, present in 12 cases (70.5%).

Conclusion: Approximately 7.1% of pregnant women exhibit asymptomatic bacteriuria, with Escherichia Coli detected in 70.5% of cases. Routine urine culture for pregnant women is crucial to mitigate maternal and obstetric complications related to this condition during pregnancy.

Keywords: Asymptomatic bacteriuria, Escherichia Coli, UTI, Urine Culture.

Introduction

Asymptomatic bacteriuria is a condition in which urine culture reveals a significant growth of pathogens that is greater than 105 bacteria/milliliters but without the patient showing symptoms of Urinary Tract Infection (UTI).[1] This is common during pregnancy and associated with risk to both mother and fetus.[2] 70% pregnant women develop Glycosurea which encourages bacterial growth in theurine.[3,4]

Pregnancy enhances the progression from asymptomatic bacteriuria to symptomatic bacteriuria which could lead to pyelonephiritis and adverse obstetric outcome such as prematurity, low birthweight[2,5] and higher fetal mortality rates.[6]In many hospitals in developing countries including Pakistan routine urine culture test is not carried out for antenatal patients probably due to cost implication and time required for availability of culture result.

Earlier studies showed that the prevalence of asymptomatic bacteriuria ranged from2.5-15%.[6] Recent figures showed this to be 4-7%.[7,8,9] The risk of bacteriuria increases with the progression of pregnancy from 0.8% in the 12th gestational week to 2% at the end of pregnancy.[10] Rationale of this study was to see the frequency of asymptomatic bacteriuria in pregnant women at Jinnah Post Graduate Medical Center (JPMC), in order to recommend protocols for dealing with the condition. As most of the studies have been done in Western countries and very few have been done in Pakistan, this does not yield enough data to screen and manage Pakistani patients.

Material and Methods

This cross-sectional study took place at the Department of Obstetrics & Gynecology in Jinnah Postgraduate Medical Centre, Karachi, spanning a duration of six months from July, 2021, to January, 2022. Considering a presumed 6% prevalence of asymptomatic bacteriuria in pregnancy, with a 3% margin of error and a 95% confidence level, the necessary sample size was determined to be 241, employing a non-probability purposive sampling technique. The study focused on primigravida women in their second trimester (12–24 weeks) of pregnancy, attending antenatal visits at the Gynae & Obstetrics outpatient Department of Ward-8, Jinnah Postgraduate Medical Centre, Karachi. Exclusions comprised women with urinary tract infection symptoms, known congenital urinary tract anomalies, medical disorders (e.g., diabetes, hypertension), asthma, pyrexia, renal disease, a history of antibiotic use in the past two weeks, or catheterization in the past two weeks.

In this study, all primigravida women in their second trimester (12–24 weeks) were selected randomly and interviewed using a detailed questionnaire. Those meeting the specified criteria were included. Participants were instructed to collect midstream urine accurately after handwashing, cleaning the perineum with soap, rinsing with water, and drying with sterile cotton. Randomly voided, clean-catch midstream urine (30–50ml) was gathered in a sterile wide-mouth container (100ml) with a cover. After immediate transportation and processing on the same day, urine culture was conducted on CLED Agar, blood Agar, and MacConkey agar using a standardized platinum (2mm) loop, incubated aerobically at 37°C for 18–24 hours. A colony unit exceeding >105 of a single recognized pathogen was considered significant and labeled as asymptomatic bacteriuria. Contamination was identified if the urine culture revealed more than one type of organism, and in such cases, the culture was repeated after seven days. Confounding variables such as singleton or twin pregnancies, maternal age, gravidity, parity, gestational age, socioeconomic status, and educational status were controlled through stratification and strict adherence to selection criteria.

Statistical data analysis in this study utilized SPSS 17.0. Descriptive statistics, including frequency and percentage, were computed to present categorical data such as socioeconomic status, education, history, investigations, asymptomatic bacteria, and types of microorganisms. Continuous response variables, such as age, gestational age, and gravidity, were expressed as mean ± SD. To assess the impact of variables such as age, socioeconomic status, educational status, and gestational age on asymptomatic bacteriuria in pregnancy, stratification was employed.

Results

This study comprised 241 primigravid women, with a mean age of 27.4 (±7.3) years. The majority of participants fell within the 21–30 age range, accounting for 139 (57.7%) individuals. In terms of socioeconomic status, 115 (47.7%) belonged to the middle class (monthly income = Rs. 7000–30000), 101 (41.9%) to the lower class (monthly income <Rs. 7000), and 25 (10.4%) to the higher class (monthly income >Rs. 30000). The distribution of education levels showed a higher percentage of illiterate women at 39.8% (96), followed by 34.9% (84) with secondary education, and 25.3% (61) with higher education.

Among the 241 women screened for asymptomatic bacteriuria, 17 (7.1%) were found to have the condition. Escherichia Coli was the predominant organism in 12 (70.5%) cases, followed by Klebsiella in 3 (17.6%) women and S. Saprophyticus in 2 (11.8%) women [Figure 1]. Stratification by age, socioeconomic status, educational level, and gestational age revealed higher rates of asymptomatic bacteriuria in those aged 21–30 years (7.2%), women with low socioeconomic status (8.9%), illiterate women (7.3%), and those with gestational age between 13–16 weeks (9.1%) [table 1].

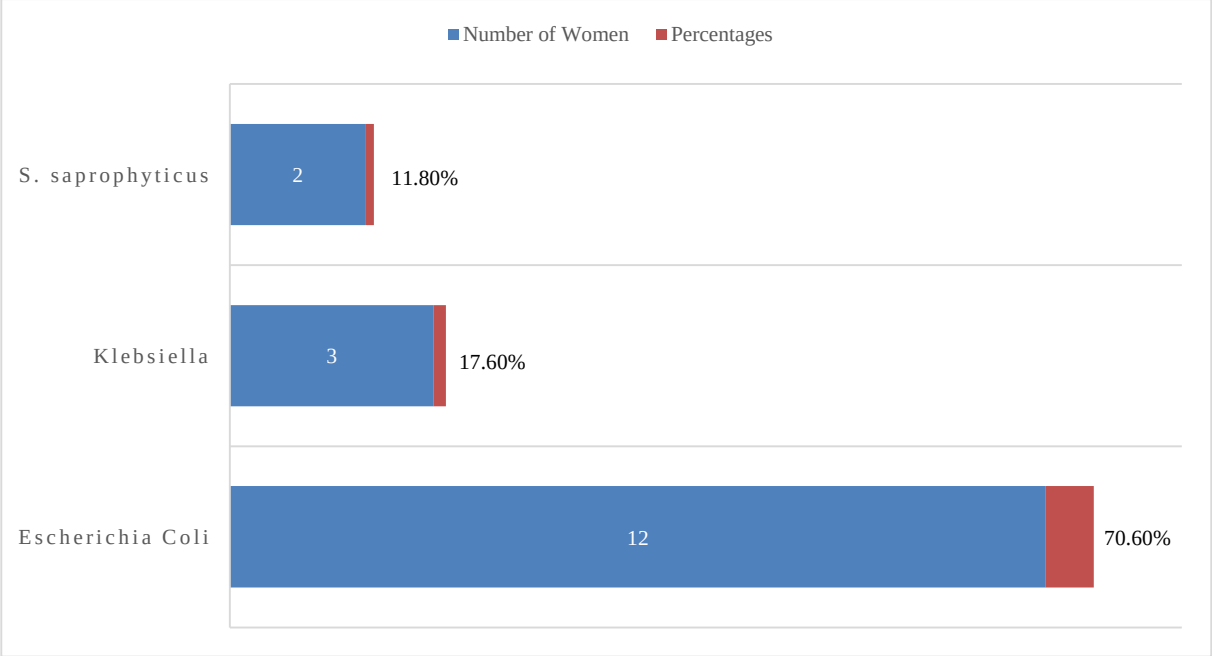

Figure 1: Prevalence of Bacterial Isolates in Asymptomatic Bacteriuria among Pregnant Women

Table 1: Gestational Age and Associated Asymptomatic Bacteriuria Rates

Gestational Age	Asymptomatic Bacteriuria	Percentages	Total
13 – 16	8	9.1%	88
1 7 – 20	5	6.0%	83
21 – 24	4	5.7%	70

Discussion

Asymptomatic bacteriuria in pregnancy is a prevalent and significant medical condition that can lead to evident renal infections like pyelonephritis if left undetected and untreated. Ahmed[11] demonstrated that, on average, treating seven pregnant women with asymptomatic bacteriuria leads to the prevention of one episode of pyelonephritis. Additionally, ten percent of pregnant women attending an antenatal clinic experienced symptomatic urinary tract infections.

During pregnancy there is apparent reduction in immunity and this encourages the growth of commensal and non-commensal micro-organisms.[4] This condition can give rise to complications such as acute pyelonephritis, hypertension, anemia, preterm labor, and intrauterine growth

retardation[12]. Furthermore, it has the potential to lead to stillbirth. Estimates indicate that 30 – 50% of women diagnosed with asymptomatic bacteriuria during pregnancy may advance to symptomatic infection. Implementing proper screening and treatment protocols for asymptomatic bacteriuria can substantially reduce the infection rate to 3%[11].

Bacteriological screening revealed that 17 out of 241 (7.1%) women in this study were positive for asymptomatic bacteriuria. Which is in agreement with others[13]. A study from Kashmir[14] reported the similar results in which prevalence of asymptomatic bacteriuria was found to be 6.1%. The prevalence of asymptomatic bacteriuria was reported to be as high as 21% in a study from Ibadan city, Nigeria[15] and 86.6% in another study from Ilorin City, Nigeria[16]. Earlier studies showed that the prevalence of asymptomatic bacteriuria ranged from 2.5-15%[6]. Recent figures showed 4-7%[7,8,9]. This variation is explained by population characteristics and by the screening methodology and definition of bacteriuria. In a study by Harini, 270 pregnant women were evaluated and the prevalence of asymptomatic bacteriuria was reported to be 9.3%[17]. In a study performed in India, 110 pregnant women were evaluated and the prevalence of asymptomatic bacteriuria was reported to be 8.1%[18].
The commonest organism causing asymptomatic bacteriuria was Escherichia coli found in 70.5% followed by Klebsiella found in 17.6% women and S. saprophyticus was seen in 11.8% women. A study from Kashmir[14] reported the same findings where Escherichia coli was the most common microorganisms isolated in positive cultures found in 70.8% women and Klebsiella was second commonest organism seen 16.7% women. Another study from Bangladesh[21] revealed that Escherichia coli was commonest microorganism in women with asymptomatic bacteriuria (72.2%) followed by S. saprophyticus (20.4%) and Klebsiella (4.6%).

Stratification was done with regards to age, socioeconomic status, educational status and gestational age to see the effect of these on outcomes. Asymptomatic bacteriuria was high in age between 21 – 30 years, 10 (7.2%). A study from Faisalabad[19] found that age group 26-30 years had the highest percentage of infection i.e. 55% and is followed by age group 25 years i.e. 25% and then is closely followed by age group 35 years with 20% infected population. The same results were observed in previous study by Imade and colleagues[22] but this is not consistent with another study by Turpin CA & colleagues in Ghana, in which highest prevalence (13%) was recorded in the age group 35-39 years and lowest rate (zero %) between 15-19 years of age[20].

Lower socioeconomic status was also considered a risk factor; percentage of asymptomatic bacteriuria was high in women with low socioeconomic status (8.9%). This results consistent with results of the study from Faisalabad[19] they reported that 60 % of women belonged to lower socioeconomic status as compared to 40% of infected women belonging to middle class. The same results were observed in a study conducted at Satellite Town and Beharia colony, Bahawalpur[23]. This difference could be due to poor hygienic practices and in lower socio- economic group.

In this study asymptomatic bacteriuria was high in illiterate women (7.3%). this result was contradicted with results from study conducted in Faisalabad,[19] they reported that 25% of females were educated above matriculation, 45% up to matriculation and 30% were uneducated. The results of this study showed that the earlier the gestational age the greater the likelihood of asymptomatic bacteriuria. Percentage of asymptomatic bacteriuria was 9.1% in women with gestational age 13 – 16 weeks. This study contradicts the other findings on duration of pregnancy. In a study done by Shankari[24] where continuous screening was done to estimate the risk of onset of bacteriuria as a function of gestational age; the risk of acquiring bacteriuria increases with the duration of pregnancy from 0.8% of bacteriuria women in the 12th gestational week to 1.93% at the end of pregnancy. The risk of onset of bacteriuria was highest between the 9th and 17th weeks of gestation. This indicates that there might be other biological or physiological explanations aside from pregnancy that increases the risk of bacteriuria. In brief this study suggests that the screening for asymptomatic

bacteriuria in pregnant women should be reviewed and focuses on pregnant women with history of urinary tract infection, and screening on their first pre-natal visit should be emphasized.

Conclusion

This study highlights a 7.1% prevalence of asymptomatic bacteriuria (ABU) in 241 pregnant women, with Escherichia Coli being the predominant organism (70.5%). Stratification by age, socioeconomic status, education, and gestational age identifies high-risk subgroups. Notably, earlier gestational ages correlate with a higher likelihood of ABU, challenging traditional assumptions. This emphasizes the need for nuanced screening, particularly in pregnant women with a history of urinary tract infections during their first prenatal visit. The findings underscore the importance of routine urine culture, contributing to tailored interventions that can mitigate complications associated with ABU in pregnancy.

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