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Original article

Asymptomatic Bacteriuria among Pregnant Women Attending Antenatal Care

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ABSTRACT

The complication associated with bacteriuria during pregnancy not only result increase morbidity of the mother but also have detrimental effects on the fetus which may result in preterm labor, fetal growth retardation, hypertension and anemia. Studies have shown that the fetal mortality rate was 2.4 times higher than in pregnancy associated with urinary tract infection.This study conducted to determine the prevalence of asymptomatic bacteriuria in pregnant women. A cross-sectional study carried out during the year 2017 at a tertiary care hospital Alkhadra in Tripoli/Libya. 200 pregnant women aged between 19-43 years attending the obstetrics and gynecology clinics were included in this study. From these patient's mid-stream clean catch urine samples were collected and processed. The following information were obtained from the patients; demographic data, parity, abortion history, history of UTI, history of DM, Urine culture result, type of organism. The minimum age was 19 years and the oldest was 43 years old. The mean maternal age of the cases was 29.2 ± 3.1 years. The multiparous cases were 61% and 48% of women had positive history to UTI before the study, also only 4% of cases were diabetic, regarding the time of diagnosis 18% were diagnosed at first trimester and 46% at the 2nd trimester while 36% diagnosed at the 3rd trimester. Regarding the urine culture results only 23% of cases had significant bateriuria and 8% had insignificant bateriuria, 14% the result was contaminated and 55% of cases their results were sterile, E. coli was the most predominant organism in the current study. The prevalence of asymptomatic bacteriuria in pregnant women (23%) was comparable with similar studies in other countries. The most common uropathogens isolated in this study were E.coli followed by K. pnuemoniae.

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INTRODUCTION

Asymptomatic bacteriuria refers to the presence of bacteria in the urine without any accompanying symptoms. It is a common condition among pregnant women and can have significant implications if left untreated [1]. During pregnancy, hormonal changes and physical factors can cause changes in the urinary tract, making pregnant women more susceptible to developing asymptomatic bacteriuria. The condition is usually caused by bacteria from the gastrointestinal tract, such as Escherichia coli, entering the urethra and ascending to the bladder [2]. To detect asymptomatic bacteriuria, routine

urine screening is recommended for all pregnant women during their first prenatal visit. This involves collecting a urine sample and testing it for the presence of bacteria. If bacteria are detected, further testing is done to identify the specific bacteria and determine the appropriate antibiotic treatment [3].

Several studies have been conducted on asymptomatic bacteriuria among pregnant women attending antenatal care. A recent cross-sectional study conducted 2024 involved 294 pregnant women found that the overall prevalence of asymptomatic bacteriuria was 17.34%, underscores the importance of screening for asymptomatic bacteriuria during prenatal care, particularly among pregnant women with advanced maternal age, higher parity, previous urinary tract infection (UTI) history, and diabetes mellitus [4]. Another study revealed that treating asymptomatic bacteriuria in pregnant women prevents complications like preeclampsia, preterm labor, low birth weight, and premature rupture of membranes [5].

In Libya, very few studies conducted to explore the prevalence of bacteriuria among pregnant women. Ben Ashur et al., 2021 carried out a study included one hundred consecutive pregnant women found that Escherichia coli was the most frequent organism followed by staphylococcus aureus. Ciprofloxacin (80%) was highly sensitive to infected bacteria [6]. Another Libyan study in 2022, found that the overall prevalence of asymptomatic bacteriuria among pregnant women in the study area was not high (28.7%), but need to be taken on consider reducing risk of infections. Escherichia coli (42.1%) was the commonest bacteria [7]. The goal of this study was to determine the prevalence of asymptomatic bacteriuria in pregnant women attending Alkhadra Hospital in Tripoli, Libya.

METHODS

Study design

A descriptive cross-sectional study was conducted in Alkhadra Hospital in Tripoli, Libya during the year 2017, involved 200 pregnant women aged between 19-43 years attending the obstetrics and gynaecology clinics were included in this study.

Data collection

A mid-stream clean catch urine samples were collected and processed. The following information were obtained from the patients; demographic data, parity, abortion history, history of UTI, history of DM, Urine culture result, type of organism.

Statistical analysis

Statistical analysis was computerized using the Statistical Program for Social Sciences (SPSS version 22) that used for data entry and analysis. Descriptive statistics were used and all results are presented as frequencies, means ± standard deviation and percentages. Categorical data were compared using the Chi-square test and Fisher's exact test if appropriate. A P-value of less than or equal to 0.05was considered statistically significant.

RESULTS

Age distribution

Regarding the age of the patients, the mean age for the patients was (29.2 ± 3.1 years). The maximum age of the patients was 43 years and the minimum age was 19 years. The highest percentage of the age distribution of the patients in this study was between 21 and 30 years, which account for 58.5%. The lowest percentage was patients more than 40 years (4%).

RESULTS

The distribution of fungal species isolated in our study as shown in figure 1, illustrating a disproportionate prevalence among the species. Trichophyton spp was 68% of the total, followed by Microsporum spp at 17%. Epidermophyton spp. were found to be 7% of the isolates, *Aspergillus spp.* Comprised 5%, and *Candida spp*. were the lowest, making up 3% of the isolates.

Table 1. Age of the patient's distribution

Age of the patients	No (%)
≤ 20 years	20 (10%)
21 – 30 years	117 (58.5%)
31 – 40 years	55 (27.5%)
> 40 years	8 (4%)

Parity distribution

The result of the parity distribution in the present study showed that most of the patients were between para 1 and para 4 (55%). Nulliparous patients were 39%, patients between para 5 and para 8 were 6%. The parity in this study ranged between 0 and 8.

Table 2. Parity distribution

Parity of the patients	No (%)
Nullipara	78 (39%)
1 – 4	110 (55%)
5 – 8	12 (6%)

Abortion distribution

With regards the abortion distribution, about 18% of the patients had no previous history of abortion and about 82 % had previous history of abortion. The abortion distribution in the current study ranged between 1 and 4 abortions.

Table 3. Abortion distribution

History of abortion	No (%)
Yes	36 (18%)
No	164 (82%)

Past history of UTI

With regards the history of UTI, nearly half of the patients had previous or recurrent history of UTI (48%). About 52% of the patients had no previous history of UTI.

Table 4. Past history of UTI

Past history of UTI	No (%)
Yes	96 (48%)
No	104 (52%)

History of Diabetes

The current study result showed that the majority of the patients had no history of diabetes (96%). Only 4% had history of diabetes.

Table 5. History of diabetes

History of Diabetes	No (%)
Yes	**8 (4%)**
No	**192 (96%)**

Gestational age at presentation

Regarding the gestational age, about 18% of the patients were in the 1st trimester, 46% were in the 2nd trimester and about 36 were in the 3rd trimester.

Table 6. Gestational age

Gestational age	No (%)
1st trimester	36 (18%)
2nd trimester	92 (46%)
3rd trimester	72 (36%)

Urine culture result

Among the 200 patients, about 23% of the urine sample showed Significant bacteriuria, 8% of the urine sample showed Insignificant bacteriuria, 14% of the urine sample were contaminated and 55% of the urine sample were sterile.

Table 7. Urine culture result

Urine culture result	No (%)
Significant bacteriuria	46 (23%)
Insignificant bacteriuria	16 (8%)
Contamination	28 (14%)
Sterile	110 (55%)

Type of organism isolated in the urine

A total of 46 bacterial isolates were identified from urine of 200 asymptomatic pregnant women. From the isolates, E. coli (50%) was the most common uro pathogen isolated followed by K pneumonia (15.2 %), and coagulase negative Staphylococcus (10.9%). P. mirabilis were isolated in 6.5% of women. C. frendii, S. aures each were found in 6.5% women. There was two mixed colony (4.3%) with E.coli and P. mirabilis.

Table 8. Type of organism

Type of organism	No (%)
E. coli	23 (50%)
K. pneumoniae	7 (15.2%)
P. mirabilis	3 (6.5%)
C. frendii	3 (6.5%)
S. aures	3 (6.5%)
CNS	5 (10.9%)
Mixed	2 (4.3%)

DISCUSSION

The complication associated with bacteriuria during pregnancy not only result in increase morbidity of the mother but also have detrimental effects on the fetus which may result in preterm labor, fetal growth retardation, hypertension and anemia. Studies have shown that the fetal mortality rate was 2.4 times higher than in pregnancy associated with urinary tract infection [8]. Women who have positive urine cultures should be treated based on the antimicrobial sensitivity patterns of the bacteria isolated from their samples to prevent maternal and foetal morbidities [9].

The purpose of this study was was to determine the prevalence of asymptomatic bacteriuria in pregnant women. In the present study, 58.5% of patients were between 21 and 30 years with mean age of 29.2 years. Similar result was seen in Debebe S in which most of the patients with asymptomatic bacteriuria were between 20 and 29 years [10].

The result of the parity distribution in the present study showed that most of the patients were between para 1 and para 4 (55%). Nulliparous patients were 39%. Similar result was reported previously in which the percentage of nulliparous was 24.5% and most of the patients were between para 1 and para 3 (61%) [11]. The study of Mukherjee et al showed different result in which the highest percentage was nulliparous women (52.8%) [12].

In this study, the prevalence of asymptomatic bacteriuria was 23%, which was similar to that observed by a study in Chitwan, Nepal conducted by Neupane et al., (26%) and that observed by a study in Cameroon conducted by Mokube M.N. et al. (23.5%) [11,13]. In contrast, some studies found lower prevalences than our study, [14-16]. and a study by Imade et al., (45.3%) reported a higher prevalence than our study. [17]. These varying results may have been due to differences in the areas being studied, in the social habits of the communities being studied and in the socio-economic statuses, standards of personal hygiene and education levels of the patients being studied.

The predominant bacteria isolated in this study were E.coli with overall isolation rate of 50 %, which is comparable with a study done in Southwest Ethiopia (47.6%) and 47.2% in Sidamo Regional Hospital [18,19]. The isolation of E.coli as a primary uropathogen might be explained by its high affinity to adhere in the uroepithelial cells compared with other organisms, due to the presence of different virulence factors [20]. K. pnuemoniae was the second most frequently isolated urinary pathogen (16.6%) in agreement with previous studies [21,22]. In contrast, in other studies it was shown that Proteus Spp is the dominant isolate after E.coli [23]. In contrast to a study by Wolday and Erge (1997), coagulase negative Staphylococcus was the most common among the gram positives isolated in this study (12.5%) [21]. This may be due to majority of the pregnant women are in sexually active age group. Only one mixed infection was found in this study in contrast to study by Gebre- selassie (1998), in which eight mixed infections were found [19].

CONCLUSION

The prevalence of asymptomatic bacteriuria in pregnant women (23%) was comparable with similar studies in other countries. The most common uropathogens isolated in this study were E.coli followed by K. pnuemoniae. Based on the present study the following recommendations can be made: 1) All pregnant women should be screened for bacteriuria with appropriate laboratory diagnostic methods, in their antenatal follow up and appropriate treatment initiated. 2) Reagent strip test or pyuria alone could not be used for screening of pregnant women for asymptomatic bacteriuria. In places where culture is not available, a combination of tests should be carried out than a single method. 3) Ciprofloxacin and nitrofurantoin are good alternatives for the treatment of significant bacteriuria in pregnancy. 4) Risk factors associated with asymptomatic bacteriuria need to be further investigated in a larger sample size in order to design preventive measures that decrease the incidence of asymptomatic bacteriuria in pregnant women. 5) The susceptibility pattern of the most common uropathogens should be monitored periodically, and indiscriminate use of antibiotics should be discouraged and safe and proper administration of existing antimicrobial agents should be promoted.

Conflict of interest. Nil

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بكتيريا البول بدون أعراض بين النساء الحوامل اللواتي يرتادن مراكز رعاية ما قبل الولادة

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المستخلص

لا تؤدي المضاعفات المرتبطة ببكتيريا البول أثناء الحمل إلى زيادة معدلات الإصابة بالأمراض لدى الأم فحسب، بل لها أيضًا آثار ضارة على الجنين مما قد يؤدي إلى الولادة المبكرة وتأخر نمو الجنين وارتفاع ضغط الدم وفقر الدم. أظهرت الدراسات أن معدل وفيات الأجنة كان أعلى بمقدار 2.4 مرة من معدل وفيات الحمل المرتبطة بعدوى المسالك البولية. أجريت هذه الدراسة لتحديد انتشار بكتيريا البول بدون أعراض لدى النساء الحوامل. دراسة مقطعية أجريت خلال عام 2017 في مستشفى الرعاية الثالثية الخضراء في طرابلس / ليبيا. تم تضمين 200 امرأة حامل تتراوح أعمارهن بين 19 و 43 عامًا في عيادات التوليد وأمراض النساء في هذه الدراسة. تم جمع عينات البول النظيفة من هذه المريضات ومعالجتها. تم الحصول على المعلومات التالية من المرضى؛ البيانات الديموغرافية، عدد الولادات، تاريخ الإجهاض، تاريخ التهاب المسالك البولية، تاريخ مرض السكري، نتيجة مزرعة البول، نوع الكائن الحي. كان الحد الأدنى للعمر 19 عامًا وكان الأكبر سنًا 43 عامًا. كان متوسط عمر الأم للحالات 29.2 ± 3.1 سنة. كانت الحالات متعددة الولادات 61٪ وكان لدى 48٪ من النساء تاريخ إيجابي لالتهاب المسالك البولية قبل الدراسة، كما كانت 4٪ فقط من الحالات مصابة بمرض السكري، فيما يتعلق بوقت التشخيص، تم تشخيص 18٪ في الثلث الأول و46٪ في الثلث الثاني بينما تم تشخيص 36٪ في الثلث الثالث. فيما يتعلق بنتائج مزرعة البول، كان لدى 23٪ فقط من الحالات بيلة دموية كبيرة و8٪ كان لديهم بيلة دموية غير مهمة، وكانت النتيجة ملوثة في 14٪ و55٪ من الحالات كانت نتائجهم معقمة، وكانت الإشريكية القولونية هي الكائن الحي السائد في الدراسة الحالية. كان معدل انتشار بكتيريا البول غير المصحوبة بأعراض لدى النساء الحوامل (23%) مماثلاً لدراسات مماثلة في بلدان أخرى. وكانت أكثر مسببات الأمراض البولية شيوعًا التي تم عزلها في هذه الدراسة هي الإشريكية القولونية تليها الكلبسيلة الرئوية.

الكلمات المفتاحية. بكتيريا البول بدون أعراض، النساء الحوامل، رعاية ما قبل الولادة.