Research Paper

The Prevalence of Bacteruria and Its Relationship With ABO Blood Group in Pregnant Women

Azam Sadat Mahmoudian1, *Mitra Jaras2, Amir Jarhi3, Abdoljavad Khajavi4, Seyyed Farzin Mircheraghi5

1. Department of Obstetrics and Gynecology, School of Medicine, Gonabad University of Medical Sciences, Gonabad, Iran.
2. Department of Community Health Nursing, School of Nursing, Arak University of Medical Sciences, Arak, Iran.
3. Department of General Education, School of Medicine, Gonabad University of Medical Sciences, Gonabad, Iran.
4. Department of Social Medicine and Health, Social Development and Health Promotion Research Center, School of Medicine, Gonabad University of Medical Sciences, Gonabad, Iran.
5. Department of Internal Medicine, School of Medicine, Gonabad University of Medical Sciences, Gonabad, Iran.

A B S T R A C T

Blood Group Antigens (ABO) are present on the surface of all cells, including urinary tract cells. Besides, they are a predisposing factor for infection in various parts of the body. The present study aimed to determine the prevalence of bacteriuria and its relationship with different blood groups.

Methods & Materials: This descriptive-analytical (cross-sectional) study was performed in 2019 on 400 pregnant women who were selected by convenience sampling method. For each pregnant woman referring to Allameh Behlool Hospital in Gonabad City, Iran, a form including patients’ demographic characteristics, medical history, and blood type was completed. Data analysis was performed in SPSS using descriptive statistics and the Chi-squared test. The significance level of the tests was considered P<0.05.

Finding: Of the explored 400 pregnant women with a Mean±SD age of 27.31±5.9 years, 58 were bacteriologically positive. There was a significant relationship between bacteriuria and ABO blood groups (P=0.001). The examined pregnant women with blood groups O (48.3) and B (29.3) were at higher risk of bacteriuria. There was a significant relationship between bacteriuria and gestational age (P=0.016); accordingly, 56.9% of the study subjects with bacteriuria were in the third trimester. There was no significant relationship between bacteriuria and educational level (P=0.944), and place of residence (P=0.494).

Conclusion: The prevalence of bacteriuria among referred pregnant women was measured to be 14.5%. Moreover, pregnant women in the third trimester of pregnancy with blood types O and B were at higher risks for bacteriuria. Therefore, considerations, such as advising this group about the susceptibility to bacteriuria and urinary tract infections, personal hygiene, and faster referral for diagnostic and therapeutic measures if presenting symptoms, as well as informing doctors and obstetricians about this condition and help to make faster decisions are recommended in this respect.

Key words: Bacteriuria, ABO blood groups, Pregnant women

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Extended Abstract

1. Introduction

Bacteriuria is any colonization of bacteria in the urinary tract. Bacteriuria may be symptomatic or asymptomatic. Bacteriuria is a symptom of bacterial colonization in the urine that causes urinary or systemic symptoms. Bacteriuria can occur in the upper urinary tract (pyelonephritis) or involve the lower urinary tract (cystitis and urethritis). Asymptomatic bacteriuria is significant bacterial colonization of the lower urinary tract without symptoms [1]. Urinary tract infections are the most frequent bacterial infections that affect human health [2]; they cause approximately 150 million deaths per year due to this infection and its associated complications, worldwide [3]. If the frequency of bacteria in one milliliter of urine equals ≥100000, the diagnosis is established [4]. Pregnancy increases the odds of getting a urinary tract infection [5].

The most common bacterial infection is during pregnancy, which may be symptomatic or asymptomatic [6]. In pregnant women, due to physiological and anatomical changes in the urinary tract, alternations in the immune system during this period increase the prevalence of bacteriuria, which poses serious risks to the mother and fetus. Additionally, the uterus is located directly above the bladder; thus, it grows and gains weight during pregnancy, which can block the flow of urine from the bladder, leading to infection. The higher levels of progesterone reduce the stretch of the uterine muscles, forcing them to expand in the same place, which reduces urinary flow; as a result, the bacteria have more time to multiply. Furthermore, during pregnancy, urinary acidity decreases, and concurrently, glucosuria increases the potential for bacterial growth [7] and increasing age, diabetes, sickle cell anemia, the history of urinary tract infection, urinary tract disorders, immune system deficiency, the risk of urinary tract infection in pregnant women increases [3, 8]. The overall prevalence of bacteriuria in Iranian pregnant women was reported to be 2%-41% [9, 10]. The rate of urinary tract infections in developing countries is estimated to be ≥250 million per year [11].

Studies in different communities suggested that gram-negative bacilli are the most frequent etiological cause of urinary tract infections; among which, Escherichia coli accounts for >80% of acute urinary tract infections [2]. Among gram-negative bacteria, in addition to Escherichia coli, Proteus Vulgaris, Klebsiella pneumonia, Staphylococcus epidermidis, Enterobacter, Citrobacter, and Pseudomonas aeruginosa are involved in urinary tract infections [12, 13]. Unlike other patients, the lack of diagnosis and timely treatment of bacteriuria in pregnancy can be associated with severe complications, such as pyelonephritis, preterm delivery, abortion, preeclampsia, hypertension, anemia, low birth weight, and anemia [14, 15]. Bacterial treatment during pregnancy reduces the risk of these complications. Therefore, screening for early detection and treatment of bacteriuria is essential to prevent its complications [16].

Bacteriuria is evident at the time of the first prenatal visit. Besides, after an initial negative urine culture, <1% of women develop a urinary tract infection [17]. In individuals with chronic urinary tract infections, bacteria can attach to cells in the urinary tract. Besides, bacterial binding is involved in the colonization of host mucosal surfaces and the inhibition of host defense [18]. Studies revealed that numerous infections are idiopathic. It is essential to understand the potential risk factors for infection. One of these critical factors is the strength of the bacteria to bind to the receptor of carbohydrate antigens on the surface of the cells of the host urinary tract. The glycoprotein at the end of these antigens is the main site of bacterial binding. Blood group antigens (A, B, O) are present on the surface of all cells, including urinary tract cells. Moreover, they are considered a predisposing factor for infection in various parts of the body [19].

Blood groups are a system of erythrocyte antigens that can be used by bacteria to attach to cells in the body. Additionally, the attachment of bacteria to host cells is a crucial step in the development and spread of the disease. Susceptibility to some diseases, including infections, cardiovascular disease, and neoplasms, is higher in individuals with certain blood groups. Furthermore, multiple studies highlighted the importance of blood group antigens to disease [20]. Strains that cause urinary tract infections have special virulence factors that impact their accumulation and adhesion to the surface of host mucosal cells and the inhibition of its immune system and contribute to the progression and development of the disease. Immunohematological research on blood group antigens and susceptibility to some diseases has become significant. This is because these antigens may create favorable conditions in an individual to contract some diseases [21].

Susceptibility to some diseases, including infections, is higher in individuals with certain blood groups. Accordingly, extensive research signified the importance of blood group antigens to these diseases [19]. The role of ABO blood type was explored in several infectious diseases [22]. Harris et al. reported the association between blood type O and the increased severity of cholera symptoms [23]. Moreover, a study conducted in Africa provided convincing evidence that blood group O is as-
associated with a reduced risk of severe malaria [24]. A study revealed that children with blood group A present a greater susceptibility for neuroisus infection, while the AB blood group is less infected than other groups [25]. Numerous risk factors are recognized for urinary tract infections, such as gender, aging, and diabetes; however, there are other risk factors, including cell surface antigens such as blood types. Genetic susceptibility to urinary tract infections remains poorly studied [26]. Some studies suggested that certain phenotypes of blood groups in the population may identify individuals at high risk for urinary tract infections [27, 28]. Other studies concluded that specific phenotypes protect against microbial colonization in the urinary tract [22, 29]. Therefore, this study aimed to investigate the prevalence of bacteriuria and its relationship with different blood groups in pregnant women.

2. Materials and Methods

This cross-sectional study was performed to investigate the prevalence of bacteriuria and its relationship with blood type in pregnant women in Gonabad City, Iran. The study participants were selected by the census method. The statistical population of this study consisted of 400 pregnant women who were referred to Allameh Behlool Gonabadi Hospital, in 2019. For each pregnant woman referring to this Hospital and gynecology clinic, a form, including patients’ details (residence place, educational level, gestational age), medical history, and blood type were completed. Accordingly, they were referred to the laboratory for a complete urine test and urine sample collection. They were prepared in sterile medium and examined for agglutination. The sample size with 95% confidence level, 80% test power, and 0.05 error was determined to be 400 (n=(Z1-α/2+Z1-β)² P(1-P))/d²=400) [30]. All examined women were identified by blood type during pregnancy. Moreover, blood type was determined using the ABO kit. The standard method for determining blood groups was tubular in two direct and indirect methods. For the direct method, a CBC blood sample was used and for the indirect method, a clot blood sample was employed. The U/A test was used for the urine test.

In this study, the urine samples of pregnant women who were referred to Gonabad Hospital and Clinic of Gonabad University of Medical Sciences were collected by the clean middle urine method (Midstream Clean Catc in sterile dishes, i.e., incubated in non-selective blood agar medium; Pronadisa Microbiological Culture Media and Diagnostic Reagent, Spain) for 24 hours at 37°C. The obtained samples with a colony count of ≥10⁵ mL/CFU were considered positive. ABO and Rh blood groups were determined using the Lorne Blood Grouping Reagents kit (UK). The blood type tests were performed by the Typing Cell or Typing Forward and Typing Back or Typing Reverse Tube methods. Initially, blood type was determined by the tubular cell typing method. First, erythrocytes were washed with physiological saline, and a 3% suspension of erythrocytes in physiological saline was prepared. Besides, 3 tubes were identified for anti-A, anti-B, anti-D, and one drop of each reagent, and the cell suspension was added to each tube and mixed. It was then centrifuged at 1500 rpm for 20 seconds. We gently removed the sediment from the end of the tube and the test result was read under a microscope. The blood type was then re-determined by the tubular Back Typing method. Due to the presence of rare and sub-blood groups, this method was performed using the individual serum to confirm the cell type method. Accordingly, 3% suspension of red blood cells A, B, and O was poured into 3 tubes, respectively. Next, 2 drops of unknown serum were added to each tube. The contents of the tubes were mixed and centrifuged at 1500 rpm for 20 seconds. Then, the tubes were gently shaken in the light and examined for agglutination. In case of coordination between type Back and type Cell, the result of the blood group was reported.

The inclusion criteria of the study were as follows: Pregnant women aged 15-45 years, no history of surgery on the urinary system, and providing a written informed consent form to participate in the study. The exclusion criterion of the study was the non-cooperation of pregnant women in the research process. After data collection, data entry into SPSS was performed and the collected data were screened and cleared. The obtained data related to qualitative variables were described using tables and reporting numbers and percentages. Moreover, quantitative variables were reported by mean and standard deviation values. Furthermore, data analysis was performed with appropriate parametric and non-parametric statistical tests (e.g., Chi-squared test), and the results were interpreted at a significance level of 0.05.

3. Results

This study examined 400 pregnant women with a Mean±SD age of 27.31±5.9 years. Of them, 58 subjects were positive for bacteriuria and 342 were negative, with a bacteriuria prevalence of 14.5%.

The frequency distribution of the explored pregnant mothers was as follows: pregnant women had blood groups O (46.2%), A (29.8%), B (14.5%), AB (9.5%), in terms of gestational age, they were in 3 the first month (28%), the second quarter (19.8%), the third quarter (52.2%). Respecting the place of residence, 75.8% of the study participants were...
urban residents and 24.2% were rural residents. Concerning educational level, 54.8% of the research units were university students and 45.2% were non-university students.

Frequent distribution in pregnant women without bacteriuria was as follows: The frequency distribution of blood group: 45.9% of blood group O, 31.6% of blood group A, 12% of blood group B, 10.5% of blood group AB. In terms of gestational age, 30.4% were in the first trimester, 18.1% in the second trimester, and 51.5% in the third trimester. Respecting the place of residence, 24.9% lived in rural areas and 75.1% in urban areas. Concerning educational level, 45.3% had no university education and 54.7% had a university education.

Frequent distribution in pregnant women with bacteriuria was as below: The frequency distribution of blood group: 48.3% were blood group O, 19% were blood group A, 29.3% were blood group B, 3.4% were blood group AB. In terms of gestational age, 13.8% were in the first trimester, 29.3% in the second trimester, and 56.9% in the third trimester. Respecting the place of residence, 20.7% lived in rural areas and 79.3% in urban areas. Concerning education, 44.8% had no university education and 55.2% had a university education. In this study, 58 (14.5%) study subjects presented bacteriuria (Table 1).

To compare bacteriuria and blood groups, a Chi-squared test was used; the relevant data indicated a significant relationship between bacteriuria and blood group (P=0.001) (Table 2). There was a relationship between bacteriuria and gestational age in the study subjects (P=0.016). Moreover, there was no relationship between bacteriuria and the place of residence (P=0.494), and the level of education in the study participants (P=0.944) (Table 3).

4. Discussion

This study investigated the prevalence of bacteriuria and the relationship between ABO blood type and bacteriuria in pregnant women referring to Allameh Behlool Gonabadi Hospital. Annually, 11% of women presented urinary tract infections and >50% of them manifested these infections during their lifetime. Treating this problem is very expensive and can also cause numerous complications. Multiple infections are idiopathic; thus, it is essential to the associated find risk factors with the infection. Therefore, by examining individuals and trying to find the prevalence of urinary tract infections as well as several risk factors for urinary tract infections, new risk factors such as cell surface antigens, like blood type are also proposed [31].

The rate of urinary tract infections is high in Iranian pregnant women. Pregnant women who are prone to urinary tract infections are at risk of prematurity, preterm delivery, low birth weight, high blood pressure, preeclampsia, anemia, maternal death [32]. Additionally, the presence or absence of anticoagulants may impact the connection of bacteria to

Table 1. Bacterial frequency distribution

| Bacteriuria | No. (%) |
|------------|---------|
| Yes        | 58(5.14) |
| No         | 342(5.85) |
| Total      | 400(100)  |

Table 2. Relationship between blood groups and bacteriuria

| Statistics | No. (%) | Blood type | Bacteriuria |
|------------|---------|------------|-------------|
| df=3       | O 28(48.3) | AB 2(3.4) | B 17(29.3) | A 11(19) | Yes |
| P=0.001    | 157(45.9) | 36(10.5) | 41(12) | 108(31.6) | No |
|            | 185(46.2) | 38(9.5) | 58(14.5) | 119(29.8) | Total |
the epithelial cells of the urinary tract [33]. The binding of bacteria to host cells is an essential step in the development of the disease; therefore, these antigens can act as the binding site of the bacterium to the cells of the body [34].

In total, 400 pregnant women referred to Allameh Behlool Hospital in Gonabadi were studied; of them, 58(14.5%) were bacteriologically positive. The overall prevalence of bacteriuria in pregnancy in Iran was reported as 10.4-7.2 [3]. In our study, the prevalence of bacteriuria in Gonabad was measured as 14.5% and in Ghohestani study, the prevalence of asymptomatic bacteriuria in pregnant women in Sabzevar equaled 7% [21]. Other studies conducted in Shiraz (5.1) [35], Torbat Heydariyeh (10%) [30] also reported this rate. Various reasons for this difference are conceivable; perhaps the main reason for the difference in the frequency of women participating in the study and the accuracy of different laboratories and socioeconomic characteristics. Besides, geographical area, province, and educational level can contribute to the lack of correlation between studies. The prevalence of bacteriuria during pregnancy is affected by several factors, such as multiple pregnancies, age, a history of urinary tract infection, diabetes, anatomical abnormalities of the urinary tract, the lack of personal hygiene, and socioeconomic status [36, 37].

The present study found a relationship between blood group and bacteriuria; phenotypes O and then B were the most common blood phenotypes concerning bacteriuria. This finding was consistent with those of Safarkar. They concluded that the association between bacterial urinary tract infection and blood group O was the most prevalent phenotype respecting urinary tract infection [38]. Benil et al.’s (2018) documented a link between lower urinary tract infection and blood type A [39]. Inconsistent with Kinane and Hooton’s study that suggested no association between blood type and urinary tract infection [40, 41], and with the study of Ghasemi et al. that the relationship between blood type and the type of bacteria causing urinary tract infection was performed, there was a significant relationship between blood type and the incidence of urinary tract infections in women [42]. Perhaps one of the reasons for the difference between the results of different studies in this field can be considered in the type and the characteristics of studied patients.

This study revealed a significant relationship between gestational age and bacteriuria. It has the highest prevalence in the third trimester of pregnancy and was consistent with the present study [43]; respecting physiological and anatomical changes in pregnant women, they were also justified with increased gestational age and elevated risk of urinary tract infections.

Moreover, there was no significant relationship between educational level and bacteriuria; although in some studies, this finding did not correspond to the results, as there was a relationship between educational level and bacteriuria [44, 45].

### 5. Conclusion

According to the present study results, bacteriuria in pregnant women in Gonabad City, Iran, is reported to be 14.5%; thus, it recommends education about the signs and symptoms related to bacteriuria and the timely referral of pregnant women to community health centers to prevent maternal and embryo complications. Bacteriuria is also more common in pregnant women with the blood group O, followed by B, indicating the greater importance of these groups for urinary screening. Women and mothers are the foundation of the family and public health; therefore, it is recommended that the right decision be made to prevent, screen, and treat this
A limitation of this study was its restricted implementation to the population of pregnant women. This study was performed only in pregnant women; thus, conducting similar studies with the target population of men and women may present different results.

**Ethical Considerations**

**Compliance with ethical guidelines**

This study was approved by the ethics committee of the Gonabd University of Medical Sciences (Ethics Code: IR.GMU.REC.1397.069).

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This study was conducted at the Gonabad University of Medical Sciences.

**Authors’ contributions**

Writing – original draft: All authors; Conceptualization: Azam Sadat Mahmoudian and Amir Jarhi; Final approval: Mitra Jaras and Abdul Javad Khajavi; Data analysis: Seyed Farzin Mircheraghi and Azam Sadat Mahmoudian; Methodology and data collection: Amir Jarhi and Mitra Jaras.

**Conflicts of interest**

The authors declared no conflicts of interest.

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مقاله پژوهشی

شیوع باکتریوری و ارتباط بین گروه خونی ABO و باکتریوری در زنان باردار مراجعه کننده به بیمارستان علامه تابستان گناباد

اعظم السادات محمودیان،* میرا جرس ۱، امیر جرجی ۲، سید فرزین میرچراغی ۳، عبدالجواد خواجوی ۴، امیر جرحی ۵

۱. گروه بیماری‌های زنان و روان‌سالن، مکانیک، علوم پزشکی، دانشگاه علوم پزشکی اراک، اراک، ایران
۲. گروه بیماری‌های زنان و روان‌سالن، مکانیک، علوم پزشکی، دانشگاه علوم پزشکی اراک، اراک، ایران
۳. گروه بیماری‌های زنان و روان‌سالن، مکانیک، علوم پزشکی، دانشگاه علوم پزشکی اراک، اراک، ایران
۴. گروه بیماری‌های زنان و روان‌سالن، مکانیک، علوم پزشکی، دانشگاه علوم پزشکی اراک، اراک، ایران
۵. گروه بیماری‌های زنان و روان‌سالن، مکانیک، علوم پزشکی، دانشگاه علوم پزشکی اراک، اراک، ایران

**کلیدواژه‌ها:** باکتریوری، گروه‌های خونی ABO، زنان باردار

**مقدمه**

باکتریوری به هرگونه کلونیزه شدن باکتری‌ها در دستگاه ادراری گفته می‌شود. باکتریوری ممکن است عامل حاملگی باشد. باکتریوری در زنان باردار مبتنی بر تاثیر گروه‌های خونی ABO و عوامل مختلف است. این مقاله تلاش خواهد کرد برای بررسی باکتریوری و ارتباط آن با گروه‌های خونی در زنان باردار مراجعه کننده به بیمارستان علامه تابستان گناباد، ایران، انجام شود.

**م上述**

باکتریوری به هرگونه کلونیزه شدن باکتری‌ها در دستگاه ادراری گفته می‌شود. باکتریوری ممکن است عامل حاملگی باشد. باکتریوری در زنان باردار مبتنی بر تاثیر گروه‌های خونی ABO و عوامل مختلف است. این مقاله تلاش خواهد کرد برای بررسی باکتریوری و ارتباط آن با گروه‌های خونی در زنان باردار مراجعه کننده به بیمارستان علامه تابستان گناباد، ایران، انجام شود.
از عفونت‌ها، اینچنیتی که به کشیدن و دارا حفر عامل خارجی اعمال می‌شود، در بی‌زمینه سلول‌های خونی پیشده وکالت به سلول‌های حفاظت‌گیری‌های کروپ‌ها و سلول‌های میکرو‌بهایی در واحدهای سلول‌های ادراری می‌باشد. البته، در این حالت، معوجات ایجاد می‌شود که از نظر افراد با خطر بالا برای عفونت ادراری می‌باشد. البته، در این حالت، سلول‌های خونی نیز مطرح هستند. حساسیت ژنتیک به عفونت ادراری خطر دیگری از جمله آنتی‌ژن‌های سطح سلول‌ها مانند گروه‌های عفونتی همچون اسهال و کاهش خطر ابتلا به اسهال می‌باشد. اگرچه نسبت استعداد بی‌پرورانند از افراد مبتلا می‌باشد، یک مطالعه نشان داده است که بروز عفونت در تعدادی از بیماری‌های خونی و ارتباط با بیماری‌های خونی چهار گروه خونی را در ارتباط با این بیماری‌ها بیان می‌کند. این آنتی‌ژن‌ها ممکن است شرایط مساعدی برای ابتلا به برخی از بیماری‌ها در افراد با گروه‌های خونی خاصی بیشتر است و مطالعات می‌تواند به پیشرفت و توسعه بیماری کمک کند. امروزه به سطح سلول‌های میزبان و مهار سیستم دفاعی آنتی‌ژن‌های گروه‌های خونی، گروه‌های خونی، ارتباط با بیماری‌های خونی و نقش داشته و به پیشرفت و توسعه بیماری کمک می‌کند. البته، در این حالت، سلول‌های میزبان و مهار سیستم دفاعی آنتی‌ژن‌های گروه‌های خونی، گروه‌های خونی، ارتباط با بیماری‌های خونی و نقش داشته و به پیشرفت و توسعه بیماری کمک می‌کند. البته، در این حالت، سلول‌های میزبان و مهار سیستم دفاعی آنتی‌ژن‌های گروه‌های خونی، گروه‌های خونی، ارتباط با بیماری‌های خونی و نقش داشته و به پیشرفت و توسعه بیماری کمک می‌کند. البته، در این حالت، سلول‌های میزبان و مهار سیستم دفاعی آنتی‌ژن‌های گروه‌های خونی، گروه‌های خونی، ارتباط با بیماری‌های خونی و نقش داشته و به پیشرفت و توسعه بیماری کمک می‌کند. البته، در این حالت، سلول‌های میزبان و مهار سیستم دفاعی
در دستگاه اداری می‌شود (22/14) بیلی‌یرین این مطالعه با هدف بررسی شیوع باتکه‌های مصرف‌پذیر در زنان باردار و ارتباط گروه‌های خونی درون یک آزمایشگاه خونی از نظر شکستان ابتلا به یک‌تکه‌های توزیع به‌طور خودکار انجام شد. ارزیابی قرطبه و سرعت کردن در فرایند هین و آنتی‌ژنیک و انحراف معیار معیار مورد حمله تکان داده شد و از نظر آگلوتیناسیون مورد بررسی قرار گرفتند. 

مکانیسم مصرف‌پذیر باتکه‌های مصرف‌پذیر در زنان باردار منفی بودند؛ بنابراین شیوع باکتریوری و ارتباط با گروه‌های خونی با استفاده از کیت Pronadisa Microbiological Culture Media and Diagnostic Reagent, Spain محیط غیراختخابی بلاد آگار به روش سل تایپ شامل موارد زیر بود: 

1. Typing Cell
2. Typing Forward
3. Typing Back
4. Typing Reverse
توزیع فرایند در خانجی‌های بارداری که مبتلا به باکتریوری بودند، با این شکل بود: توزیع فرایند گروه خونی، درصد گروه خونی O، 24 درصد گروه خونی A و 12 درصد گروه خونی B بوده‌اند. از نظر سن بارداری، 24/40 درصد زنان، در سه ماهه اول، 18/71 درصد از سه ماهه دوم و 11/18 درصد از سه ماهه سوم بوده‌اند. در نتیجه، آنالیز مکملها و سطح تحصیلات، نشان داد که رابطه معنی‌داری بین باکتریوری و گروه خونی وجود نداشت و بین باکتریوری و محل سکونت همکاری نبود.

به طور کلی، نتایج این مطالعه نشان داد که در معرض خطر نارس بودن جنین، زایمان میزان عفونت ادراری در زنان باردار ایرانی بالا است. زنان باردار عوامل خطر جدیدی از جمله آنتی‌ژن‌های سطح سلول‌های ممکن است عامل مؤثر در اتصال باکتری به سلول‌های اپیتلیال مجاری ادراری باشند. از آنجا که اصل باکتری به سلول‌های میزان مربوط می‌شود، کاسته شدن 

| گروه خونی | باکتریوری | تمامه (فرد) | 95% اطمینان | 99% اطمینان |
|-----------|-----------|--------------|--------------|--------------|
| O         | 0.75       | 0.979        | 0.999        |
| AB        | 0.87       | 0.985        | 0.996        |
| B         | 0.69       | 0.965        | 0.995        |

جدول 1. توزیع فرایند باکتریوری

جدول 2. توزیع گروه‌های خونی با باکتریوری

| الکل‌های آزمون | گروه خونی | باکتریوری |
|---------------|-----------|-----------|
| O             | 0.87       | 0.985     |
| AB            | 0.69       | 0.965     |
| B             | 0.75       | 0.979     |
بیماری است، این انتخاب‌ها می‌تواند محل اتصال باکتری به سلول‌های زن باردار مراجعه کننده بیمارستان علامه بهلول گنابادی باشد. در مطالعه ما 14/5٪ نفر (58) بهلول گنابادی بررسی شدند که از این تعداد 14/5٪ دارد. شیوع کلی باکتریوری در ایران بین 10/5٪ تا 7/2٪ حاملگی در این بیمارستان مشاهده شد. در مطالعه ما بیش از باکتریوری در گناباد در مطالعه ای دیگر قهستانی شیوع باکتریوری بدون علامت در زنان باردار شهرستان سبزوار را 10/5٪ (58) تربت حیدریه (59) درصد حمله گزارش کردند. دلایل گوناگونی می‌توان برای این اختلاف تصور کرد، شاید بتوان مهم‌ترین علت تفاوت را در تعداد زنان شرکت‌کننده در مطالعه و دقت آزمایشگاه‌ها و ویژگی‌های اجتماعی و اقتصادی دانست. همچنین منطقه جغرافیایی، استان و سال مطالعات می‌تواند علت همسو نبودن نتایج مطالعات باشد. شیوع باکتریوری در دوران بارداری تحت تأثیر عوامل متعددی مانند: حاملگی‌های متعدد، سن، سابقه قبلی عفونت ادراری، دیابت، ناهنجاری‌های آناتومی دستگاه ادراری، رعایت نکردن بهداشت شخصی و وضعیت اقتصادی اجتماعی قرار می‌گیرد. در مطالعه حاضر مشخص شد که بین گروه‌های A و B ارتباط بی‌جایی و باکتریوری ارتباط وجود دارد که قابل قبول‌یابی دارد. مطالعه‌های دیگر نشان داده که بیماران باکتریوری فر روز گزارش می‌کنند. در مطالعه حاضر مشخص شد که بین گروه‌های A و B ارتباط بی‌جایی و باکتریوری ارتباط وجود دارد که قابل قبول‌یابی دارد. مطالعه‌های دیگر نشان داده که بیماران باکتریوری فر روز گزارش می‌کنند. در مطالعه حاضر مشخص شد که بین گروه‌های A و B ارتباط بی‌جایی و باکتریوری ارتباط وجود دارد که قابل قبول‌یابی دارد. مطالعه‌های دیگر نشان داده که بیماران باکتریوری فر روز گزارش می‌کنند. در مطالعه حاضر مشخص شد که بین گروه‌های A و B ارتباط بی‌جایی و باکتریوری ارتباط وجود دارد که قابل قبول‌یابی دارد. مطالعه‌های دیگر نشان داده که بیماران باکتریوری فر روز گزارش می‌کنند.

| شاخص | گروه‌های A | گروه‌های B |
|-------|-------------|-------------|
| سن حاملگی | تفاوت | تفاوت |
| 28 (df=2) | 0.016 | 0.016 |
| 19 (df=2) | 0.016 | 0.016 |
| تعداد (درصد) | 219 (54/8) | 181 (45/2) |
| تعداد (درصد) | 209 (52/2) | 171 (43/8) |
| محل سکونت | شهر | روستا |
| 303 (75/8) | 97 (24/2) |

نتیجه‌گیری
با توجه به نتایج مطالعه حاضر باکتریوری در زنان باردار شهرستان قهستان 14/5٪ درصد گزارش شده است. توصیه می‌شود برای تشخیص و علائم هر نوع باکتریوری و مشخصات جمعیت شناسی.
ملاحظات اخلاقی

پژوهشگران همه کدهای اخلاقی مربوط به تحقیقات روی نمونه‌های سالمی را رعایت کردند و مجوز‌های لازم را از مراجع فنی صلاح از دانشگاه علوم پزشکی گناوه اخذ کرده‌اند. (کد: IR.GMU.REC.1397.069)

حامی مالی

این تحقیق توسط گروه کمک مالی از سازمان‌های ثامن‌مالی در بخش‌های مختلفی از تأمین مالی دریافت نموده‌اند.

مشارکت ویژه‌سنجگان

نوشتن نسخه اولیه توسط مهم نویسندگان این ایده اصلی: اعمال سلخات محمودیان، امیر جرحی، نیکی عباسی، میترا جرس، ظریف ساداتی، نیکی عباسی، اعمال سلخات محمودیان، طراحی مطالعه و گردآوری داده‌های آمری جرحی، میترا جرس.

تعارض منافع

نویسندگان این مقاله اعلام کرده‌اند که هیچ گونه تعارض منافعی در این پژوهش وجود ندارد.

تشکر و قدردانی

نویسندگان در این مقاله اعلام کرده‌اند که هیچ گونه تعارض منافعی در این پژوهش وجود ندارد.

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