

Asymptomatic Bacterial Infection in Pregnancy: A new update

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Abstracts

Urinary tract infection is more common in women than in men and is usually associated with a bacterial infection which causes bacteriuria as one of the symptoms/diagnoses of bacterial infection; however, asymptomatic bacterial infections sometimes do not need argent treatment, but in specific causes such as pregnancy may require medical intervention .

This study analyzes 210 articles and relevant guidelines for Asymptomatic bacterial infection (bacteriuria) in pregnant women in the U.S., U.K., and Canada. Material and Methods: The procedures are compared to the literature, including various studies on rates and cost-benefit analysis. In conclusion, several articles and guides prefer routinely testing pregnant in the first trimester.

Keywords: Bacteriuria, Trimester, Pregnant Women, Bacterial Infections

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1. Introduction

Urinary tract infection (UTI) is a common problem in pregnancy, which arises due to physiological changes in the female urinary tract; among these cases is Asymptomatic Bacteriuria (ASB), which means the presence and growth of bacteria in the urinary tract, while women do not have any urinary symptoms. However, asymptomatic bacterial infections sometimes do not need argon treatment, but specific causes, such as pregnancy, may require medical intervention. But some cases, such as in pregnant women, if not treated, can lead to complications such as kidney infections (pyelonephritis), hypertension, anemia, premature and low birth weight babies, and prenatal death.

[1] The etiology of uncomplicated community UTI is also frequently attributable to other Gram-negative, such as *Proteus* spp., *Klebsiella* spp., and *Enterobacter* spp., and more rarely to Gram-positive, such as *Enterococcus* spp. and *Staphylococcus* spp., *E. coli* is scaled down to account for less than 80% of the cases studied, while other bacterial species (both Gram-positive and Gram-negative) that can be acquired by the patient from the hospital microbial population assume greater importance [2,3,7]

Fosfomycin and trometamol, used in a dose once a week and 100 mg of nitrofurantoin every six hours for 5 days, are the first-line antibiotics for cystitis. Cefuroxime or Augmentin for two days is 2nd line medications. Ampicillin and other cepha-

losporins may be taken during gestation; however, there is a greater risk of treatment failure. Renal cultures must be used to validate each occurrence of recurrent UTI. Treatment should begin only when a urine sample has been taken and follow the same guidelines for isolated incidents. Options for preventing recurrent UTIs include behavioral interventions, nonantimicrobial prophylaxis, and antimicrobial prophylaxis [3].

In some cases, postmenopausal women are advised to use vaginal estrogens. Weak evidence supports the use of other prophylactic nonantimicrobial, such as cranberry and immunoprophylaxis. Antibacterial prophylaxis can be administered continuously or after sexual activity. Options for pregnant women include nitrofurantoin 100 mg and cephalexin 250–500 mg; women who are not pregnant can take nitrofurantoin 100 mg or Fosfomycin 3 g every ten days (continuous or postcoital)[2].

In recent years there has been a steady increase in resistance levels to antibiotics that are used most frequently in treating UTIs, albeit with differences between the various countries. The phenomenon mainly concerns drugs such as co-trimoxazole and ampicillin; however, some geographical areas have also observed relatively high incidences of resistance to fluoroquinolones [2,3].

Asymptomatic Bacteriuria ASB is defined as bacterial growth through urine culture without

urinary symptoms and is most likely caused by *Escherichia coli*, but can also be caused by organisms such as *Staphylococcus saprophyticus*, *Klebsiella* spp, *Enterobacter* spp, *Proteus* spp, *Enterococcus* spp, and others. [2] The diagnosis is based on a quantitative count of greater than 100×10^6 colony-forming units of bacteria per liter of urine without noticeable symptoms of UTI. The estimated prevalence of ASB is approximately 2-10% of premenopausal women [3].

Objective

The purpose of this study is to analyze the current screening guidelines for ASB among pregnant women in some select countries. These guidelines are based on varying research, which differs on the importance of screening measures for this condition. The hypothesis is that the study will overwhelmingly point to a proactive approach to screenings and that there will be areas of opportunity for improvement of the guidelines. The countries selected are expected to come close, if not meet, these standards.

Scope & Method

In this study, we conduct a meta-analysis of past research. We analyzed 210 articles and relevant guidelines for Asymptomatic bacterial infection (bacteriuria) in pregnant women in the U.S., U.K., and Canada, As shown in (figure 1). We searched google scholar, directory open access journals, PubMed, and other search engines using several words such as "Bacteriuria, Trimester, and Pregnant Women" we excluded symptomatic bacteremia and immunocompromised pregnant; these articles were found through multiple databases and sources from the literature. First is the question of whether ASB should be screened during pregnancy. This will include various reports on frequency and risk factors. Also, the guidelines of specific countries, i.e., the UK, Canada, and the United States, will be thoroughly examined. Finally, other specified factors contributing to higher risk will be analyzed against today's various ASB guidelines and procedures.

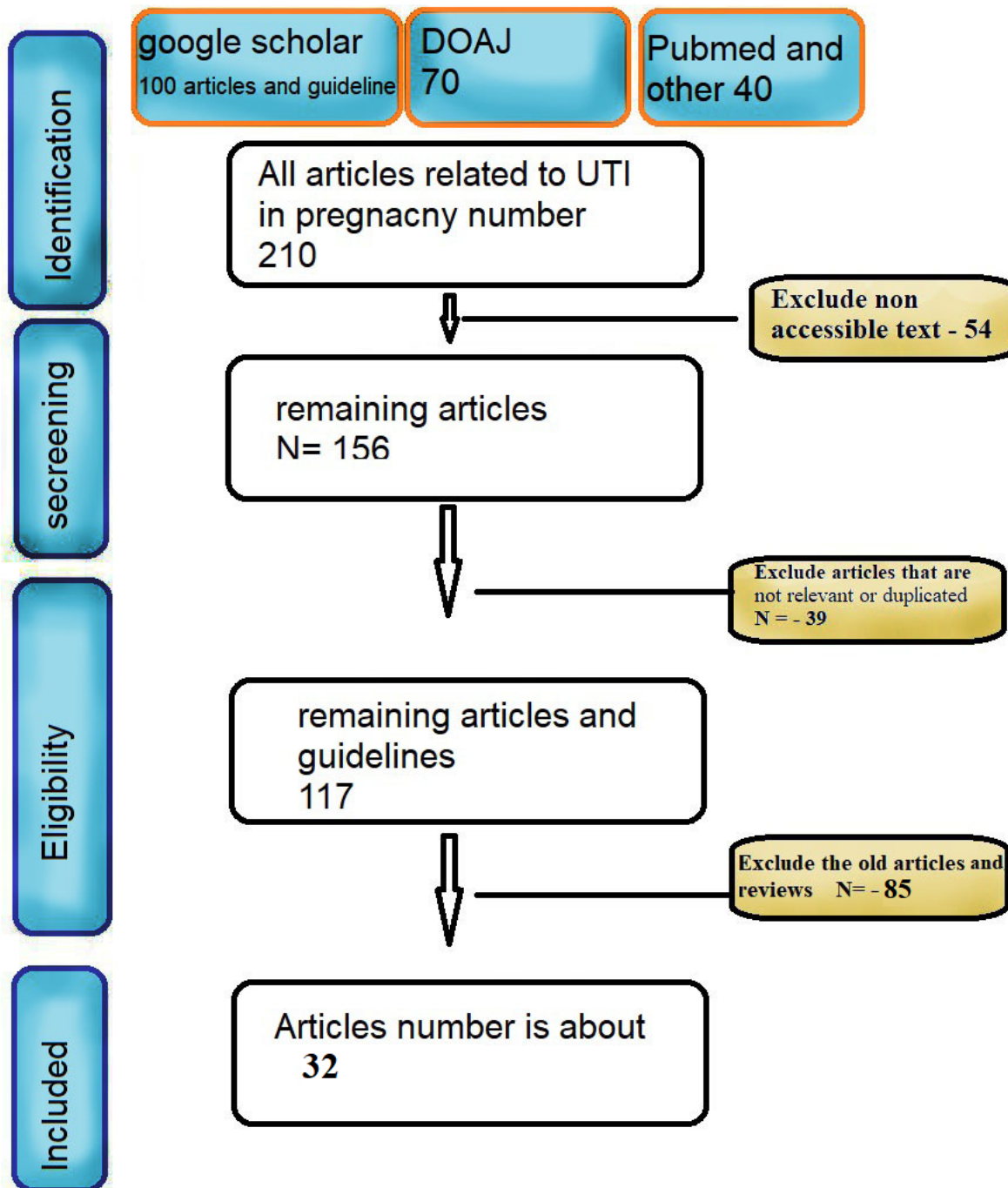


Figure 1 illustrates a selection of articles about asymptomatic bacteriuria and pregnancy.

Controversy

Existing approaches to detecting ASB are mainly based on research trials conducted more than 30 years ago. This, along with the cost-benefit analysis of testing every pregnant woman, raises a de-

bate about the condition's significance among doctors and researchers[3,4]. This has led many countries toward poor or non-existent guidelines and procedures for protecting pregnant women from ASB-induced complications[4]. This study will attempt to bridge this gap, remain unbiased,

and contain review research from different countries.

Analysis

Relevant literature

A team of researchers at Uludag University addressed whether ASB should be screened during pregnancy in 2002 [4]. The purpose of the study was to determine the rate of ASB and complications during pregnancy, involving 270 pregnant women who were screened with a urine culture. The study observed a 9.31% incidence of ASB. Furthermore, 6 of the 23 positive cases (26%) were diagnosed with preterm labor. The study recommended routine ASB screening for all pregnant women [4]. A similar study was conducted by the Jimma Institute of Health Sciences, where 326 pregnant women were tested for ASB in 1997. Of the 326 women, 24 (7%) were positive for ASB. [5] A pair of researchers investigating the risk factors for ASB throughout gestation conducted the subsequent study in Bahawalpur. The method was a data collection of 3000 homes in an area randomly sampled down to a select 1200. From that, 580 women were diagnosed with ASB, and the study concluded that ASB might be a bacterial infection for women [6].

A more extensive study conducted in a hospital in Nigeria contained more extreme results. 1,228 pregnant women were screened and reported not having UTI symptoms. A total of 556 (45.3%) were diagnosed with ASB, concluding that rou-

tine check-up of ASB for pregnant women is recommended, regardless of age or trimester [7]. This study shows that varying geographical locations can significantly impact the prevalence of ASB. A population-based study conducted in 2008 took data on almost 200,000 deliveries around the world. They found a slight 2.5% reported ASB cases from 199,093 deliveries. [8] This rate disparity is likely due to the delocalized nature of the study compared to the Nigerian research, which may have resulted from contaminated water.

Many more studies illustrate the geographic disparity in rates. A study was conducted at Mount Sinai hospital in 2004 to study different screening measures for ASB. Among the 1050 pregnant women tested, 49 were diagnosed with ASB (4.7%). Although this rate is relatively low, the study recommended screening for ASB, emphasizing the need for a recurring culture in each trimester to identify cases better [9].

Taking the cost perspective, a study was done in 1989 to determine whether routine screening of patients for bacteriuria is cost-saving and cost-effective. They conclude that routine screening of pregnant women for ASB would be very cost-effective in preventing pyelonephritis and should be the standard of practice [10]. A similar study was conducted shortly after and compared two screenings' effectiveness, benefits, and costs to prevent pyelonephritis in pregnancy. This study

concluded that screening for ASB during pregnancy is cost-beneficial [11,12].

The highlighted studies point towards a more proactive approach to screening for ASB. This seems to be especially true for underdeveloped countries, likely due to sanitation and contamina-

tion. Pregnant women have reduced immune function; therefore, special care must be taken to ensure a smooth delivery. Following this literature analysis, guidelines from some of the selected countries in ASB will be evaluated against these findings.

Guidelines

The following (table1) outlines the screening recommendation of the selected countries.

Table 1: The ASB guidelines for Canada, the United States, and the UK

Country/ Organization	Description
Canada (Canadian Task Force on Preventive Health Care)	Urine cultures should be used once during the first trimester of pregnancy to check for asymptomatic bacteriuria in pregnant women (weak recommendation; very low-quality evidence). Pregnant women who do not have symptoms of urinary tract infection or who do not have an increased risk of developing asymptomatic bacteriuria should follow this advice. There is strong support for performing a single culture-based prenatal screening at 12–16 weeks of pregnancy for asymptomatic bacteriuria [13,14]
U.S. (the United States Preventive Services Task Force)	Urine culture screening for asymptomatic bacteriuria is recommended for pregnant women between the ages of 12 and 16 weeks or at the first prenatal appointment if later. (Grade A: The U.S. Preventive Services Task Force advises the service. The likelihood that the net benefit will be significant is very high) [15-18]
USA (The American Academy of Family	Recommend the detection of asymptomatic bacteriuria in the first trimester of pregnancy in pregnant women (Grade A: consistent and

Physicians)	good quality patient-oriented evidence). Asymptomatic bacteriuria in pregnant women should be treated with antibiotics for three to seven days (Grade B: inconsistent or limited quality patient-oriented evidence) [19,20].
U.S. (Infectious Disease Society of America)	Recommend At least once in the early stages of pregnancy, and pregnant women should have a urine culture performed to check for bacteriuria; If the results are positive, they should be treated (Grade A-I). After treatment, routine tests for recurrent bacteriuria (grade A-III) should be performed. It is impossible to advise in favor of or against repeat screening of pregnant women who tested negative for culture [21-23]
U.K. (The National Institute for Health and Care Excellence)	Recommend routine midstream urine culture screening for asymptomatic bacteriuria in women early in pregnancy. Pyelonephritis is less likely when asymptomatic bacteriuria is identified and treated [24-27].
Scotland (Scottish Intercollegiate Guidelines Network)	Recommend performing a routine standard quantitative urine culture at the first prenatal appointment (Grade A). A second urine culture should be used to confirm the presence of bacteria in the urine (Grade A). Avoid using a dipstick to check for a bacterial UTI (Grade A) at the initial appointment or any later. Use an antibiotic to treat asymptomatic bacteriuria found during pregnancy (Grade A). Every antenatal appointment until delivery should include a repeat urine culture for women whose bacteriuria is confirmed by a second urine culture (Grade C)[28-30].
Guideline of the Swiss Society of Gynecology and Obstetrics (SSGO)	It is no longer advised to screen pregnant women with asymptomatic bacteriuria routinely. However, acute UTI or ASB in risk populations should be managed effectively. For all pregnant women, bacterial screening after vaginal smears is still advised [31,32].

Results

Screening of pregnancy by urine samples taken at the first visit pregnancy and treating ASB is a long-standing procedure in Canada (weak recommendation) that helps cure pyelonephritis for pregnant women. It can also reduce the amount of low-birth-weight babies.

In other countries such as the USA, the U.K., and Scotland, recommendations for screening and treating ASB in pregnancy are grade A recommendations.

Conclusions

Several guidelines focused on the importance of medical intervention and fast diagnosis of asymptomatic bacteriuria. They must be treated, such as the U.K., U.S., and Scotland suggest diagnosis and treatment in stage A, The optimization of antibiotic therapy strategies are of great importance in UTIs, both to avoid the spread of particularly resistant strains and because these infections have a significant impact not only on the quality of life of patients but also on health costs related to their management.

Recommendations

This recommendation to support the screening for ASB during pregnancy acknowledges that some women who are not at high risk for ASB during pregnancy and are more concerned about potential antibiotic side effects can choose not to be tested or treated for ASB; in such circumstances, there is a potential for a value-based decision. Pregnant women at high risk of ASB should follow recommendations

for higher-risk populations rather than this one. There is not enough signal to support a guideline for or against repeated screening throughout gestation, after an initial negative screening, or after treatment of the first episode of ASB in low-risk pregnant women

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Conflicts of interest The authors declare no conflict of interest.

Ethical approval

This study is a review article. There are no humans, animals, or data included in this article

Author contribution

Dr. Manal Awad: draft writing, supervision, and data analysis. Maher Elsahar: proofreading and editing the article,

All the authors approved the submission of this manuscript.

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