



به نام خدای بخشنده و مهربان

In the name of Allah, the Beneficent, the Merciful.

Asymptomatic bacteriuria

M.R.Abbasi

MD

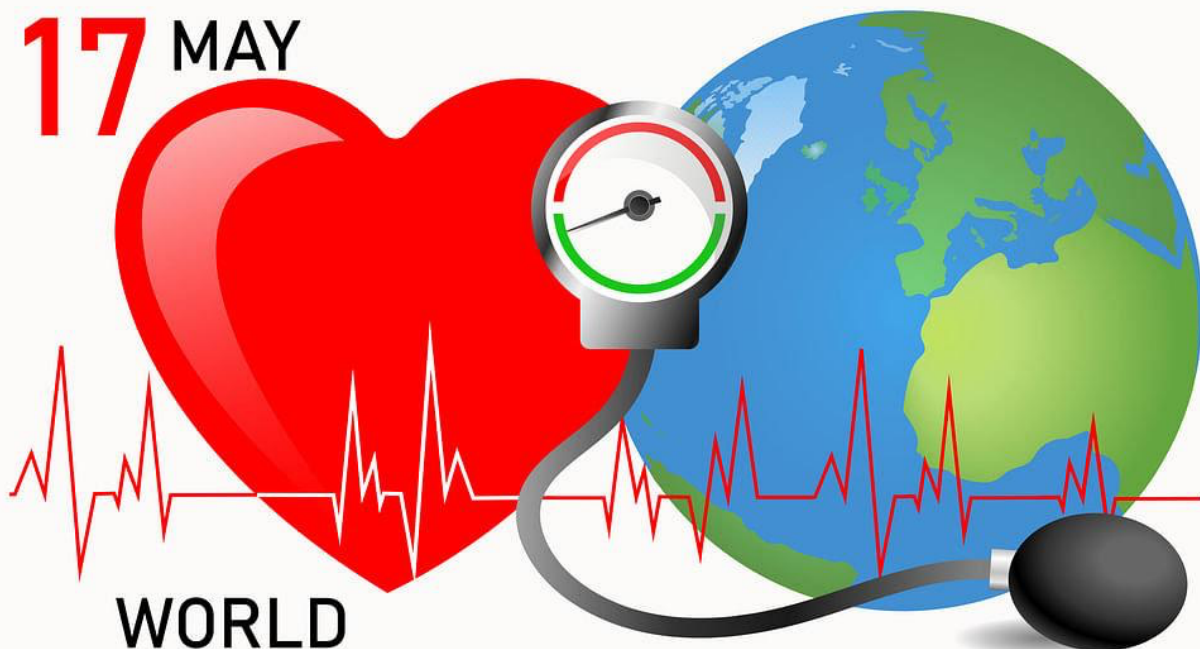
Internist

Nephrologist

Tehran university of medical sciences

Abbasi M

17 MAY



WORLD

HYPERTENSION DAY

- خانم 35 ساله متاهل بدون سابقه بیماری خاصی در آزمایش سالیانه متوجه نتیجه کشت ادرار مثبت شده است و به شما مراجعه کرده است. نتیجه به شرح زیر است:

- U/A 5-6 WBC

- U/C : E.Coli 100000/ml, sensitive to cipro/levo/ofloxacin/Cefixim/Cotrimoxazol

- اقدام بعدی چیست؟

- شرح حال: بیمار شکایت ادراری شامل سوزش، تکرر و احساس فوریت ندارد.
- اقدام بعدی چیست؟
- تکرار آزمایش 2 هفته بعد
- شروع یکی از آنتی بیوتیک های مناسب با توجه به آنتی بیوگرام
- سونوگرافی کلیه ها و مثانه
- هیچکدام

Asymptomatic Bacteriuria

- the presence of bacteria in the urine in the absence of urinary symptoms

Table 1 Asymptomatic Bacteriuria Prevalence Across Selected Populations*

Population	Prevalence (%)
Healthy women (<50 years old)	1.0 to 5.0
Healthy women (> 50 years old)	2.8 to 8.6
Pregnant women	1.9 to 9.5
Older long-term care residents	
*Men	15.0 to 40.0
*Women	25.0 to 50.0
Older community-dwelling patients	
Men	3.6 to 19.0
Women	>15.0
Patients with diabetes	
Men	0.7 to 1.0
Women	9.0 to 27.0
Patient with spinal cord injury	
Intermittent catheter	23.0 to 89.0
Patients on hemodialysis	28.0
Patients with indwelling catheter	
Short-term	9.0 to 23.0
Long-term	100

*Data adopted from the *American Family Physician*.

Table 2 Asymptomatic Bacteriuria Diagnostic Criteria

Lack of signs and symptoms of urinary tract infection (includes dysuria, urinary frequency or urgency, or suprapubic pain, etc.)

PLUS one of the following:

Midstream clean-catch urine specimen:

- For asymptomatic men: single voided urine specimen with 1 bacterial species isolated in quantitative count $\geq 100,000$ CFU/mL
- For asymptomatic women: 2 consecutive voided urine specimens with isolation of same bacterial strain in quantitative counts $\geq 100,000$ CFU/mL

Catheterized urine specimen:

- For men or women: single catheterized urine specimen with 1 bacterial species isolated in quantitative count ≥ 100 CFU/mL

CFU = colony forming unit; IDSA = Infectious Disease Society of America.

*Data adopted from *American College of Physicians* and IDSA.

- آقای 70 ساله مبتلا به دیابت قندی، فشار خون بالا،
نفروپاتی دیابتی با آزمایش زیر مراجعه کرده است
 - BUN=40 mg/dl
 - Creatinin=3 mg/dl
 - Hb=8.7gr/dl
 - VBG= metabolic acidosis PH=7.30
 - U/A 2+ protein, WBC 8-10/ml
- U/C= Enterococcus faecalis=100000, **resistant**
to Cipro/Levofloxacin, Cefixim

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- گرفتن شرح حال
- بیمار علایم ادراری ندارد
- از ضعف و بی حالی شکایت است
- است mmHg فشار خون بیمار 145/85
- اقدام بعدی چیست؟

- بیمار بستری شود و آنتی بیوتیک تزریقی دریافت کند
- آنتی بیوتیک خوراکی شروع شود و 2 هفته بعد کشت ادرار مجدد انجام و مراجعه کند
 - کشت ادرار تکرار شود
 - هیچکدام

- آقای 45 ساله با سابقه تصادف و ضایعه نخاعی منجر به فلج اندام تحتانی دوطرف و مثانه نوروزنیک که کاتتر ادراری دائم دارد، با آزمایش زیر مراجعه کرده است
 - U/A many WBC
 - U/C = E.Coli 100000 cc/ml
 - اقدام بعدی چیست؟

- گرفتن شرح حال و معاینه
- با توجه به ضایعه نخاعی و اختلال حسی، علائم ادراری ندارد
- کاهش اشتها، اختلال هشیاری و افت فشار خون ندارد.
تب ندارد
- نیاز به درمان ندارد

- خانم 30 ساله ، در هفته بیستم بارداری با آزمایش زیر توسط متخصص زنان و زایمان جهت مشاوره ارجاع شده است:

- $U/A = 8-10 \text{ WBC /ml}$

- $U/C = E.coli, 100000$

- هیچگونه علائم ادراری ندارد.

- $T=36.7 \text{ C}$

- در معاینه تندرس در ناحیه فلانکها و سوپراپوبیک ندارد.
- اقدام بعدی چیست؟

- تکرار کشت ادرار
- شروع آنتی بیوتیک
- نیاز به درمان ندارد

- از همه خانمها در اوایل بارداری باید کشت ادرار انجام شود.
- درصد از موارد باکتریوری بی علامت در حاملگی 30-40 به عفونت ادراری علامت دار شامل سیستیت و پیلونفریت می شود که ضمن خطر برای مادر می تواند منجر به زایمان زودرس، وزن کم حین تولد و مرگ و میر نوزاد در حوالی زایمان گردد.

Antibiotics for asymptomatic bacteriuria and cystitis in pregnancy

Antibiotic	Dose	Duration	Notes
Nitrofurantoin	100 mg orally every 12 hours	5 to 7 days	Does not achieve therapeutic levels in the kidneys, so should not be used if pyelonephritis is suspected. Typically avoided during the first trimester and at term; however, it is an appropriate alternative during these periods when other options cannot be used.
Amoxicillin	500 mg orally every 8 hours or 875 mg orally every 12 hours	5 to 7 days	Resistance may limit its utility among gram-negative pathogens.
Amoxicillin-clavulanate	500 mg orally every 8 hours or 875 mg orally every 12 hours	5 to 7 days	
Cephalexin	250 to 500 mg orally every 6 hours	5 to 7 days	
Cefpodoxime	100 mg orally every 12 hours	5 to 7 days	
Fosfomycin	3 g orally as single dose		Does not achieve therapeutic levels in the kidneys so should not be used if pyelonephritis is suspected.
Trimethoprim-sulfamethoxazole	800/160 mg (1 double-strength tablet) every 12 hours	3 days	Typically avoided during the first trimester and at term; however, it is an appropriate alternative during these periods when other options cannot be used.

The durations listed in the table are based on data from studies conducted in both nonpregnant and pregnant women.

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- آقای 65 ساله با سابقه دیابت و پرفشاری خون جهت مشاوره قبل از جراحی پروستاتکتومی مراجعه کرده است.

- فشار خون 140/80 میلی متر جیوه
 - Creatinin= 1.4 mg/dl
 - U/A= Many WBC
- U/C= *klebsiella pneumoniae* 100000/ ml
 - اقدام بعدی چیست؟

- اخذ شرح حال و معاینه
- بیمار تب و هیچگونه علامت ادراری ندارد
- اقدام بعدی؟
- تکرار کشت ادرار 2 هفته بعد
- سونوگرافی از کلیه ها ، مثانه و پروستات
- تجویز آنتی بیوتیک بر اساس آنتی بیوگرام
- نیاز به درمان آنتی بیوتیکی ندارد

- خانم 70 ساله اي جهت مشاوره ارجاع شده است. سابقه هيپرتانسيون دارد و تحت درمان با املوديپين مي باشد. قرار است تحت عمل جراحي تعويض مفصل زانوي راست قرار گيرد . آزمايشها به شرح زير است

- BUN= 25 mg/dl
- Cr= 1.3 mg/dl
- Na= 137 mmol/lit
- K=4.5 mmol/lit
- U/A= WBC 3-4/HPF

• اخذ شرح حال و معاینه

• بیمار علامتی از مشکلات ادراری شامل دیزوری و فرکونسی ندارد. تب ندارد. تندر نس در ناحیه سوپراپوبیک و فلانکها ندارد

• اقدام بعدی چیست؟

• تجویز آنتی بیوتیک

• تکرار کشت ادرار

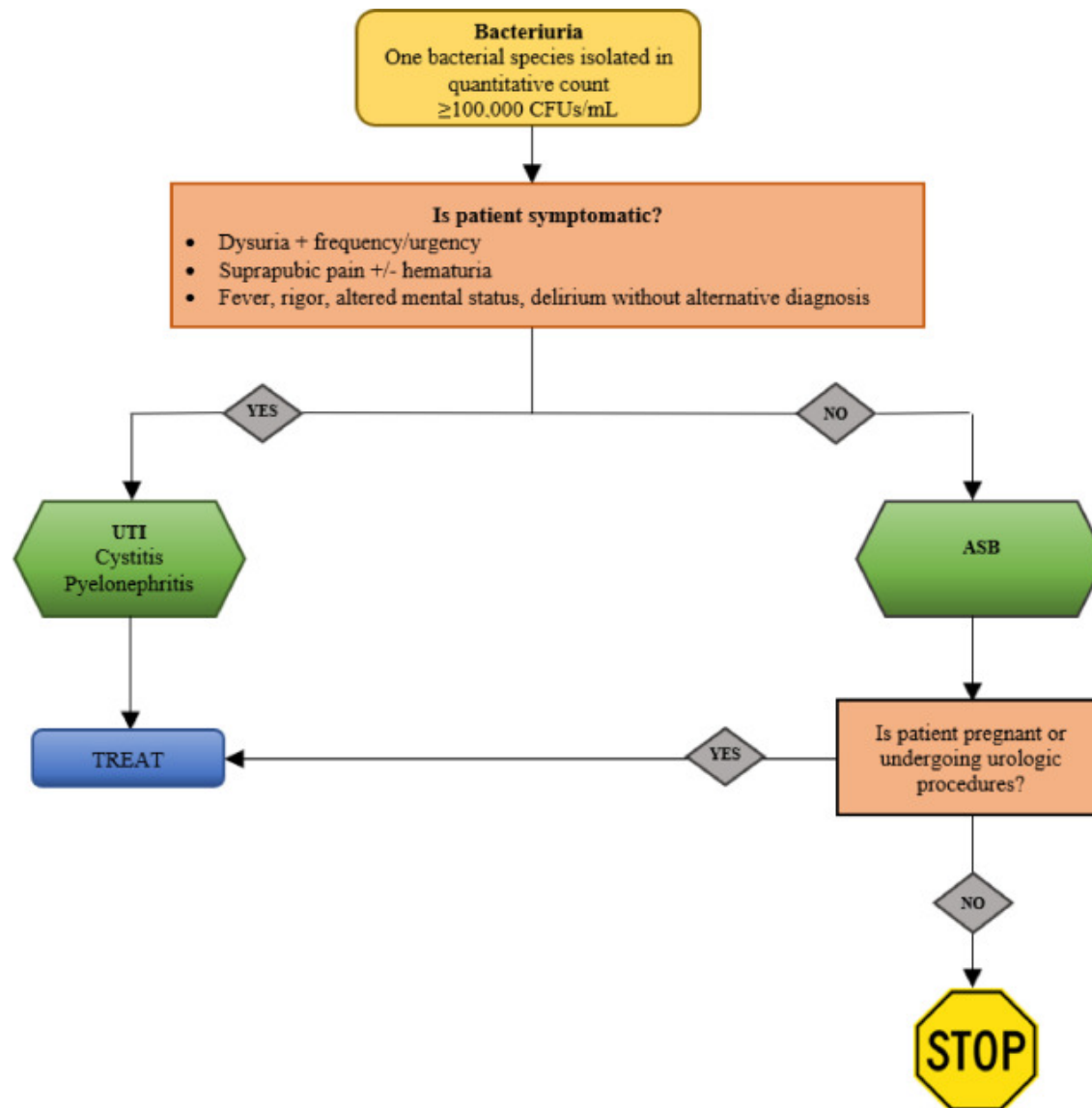
• سونوگرافی کلیه ها و مثانه پر و خالی

- خانم 35 ساله که 4 ماه پیش تحت پیوند کلیه قرار گرفته است بدلیل عدم دسترسی به پزشک معالج خود مراجعه کرده است.

- آزمایشها به شرح زیر است:

- $Cr = 0.9 \text{ mg/dl}$
- $U/A = \text{WBC } 8-10/\text{hpf}$
- $U/C = \text{E.Coli } 100000/\text{ml}$
- اقدام بعدی چیست؟

- اخذ شرح حال و معاینه
- شکایتی از سوزش ادرار، تکرر، تب و یا لرز ندارد
- در محل کلیه پیوندی درد و یا تندرنس ندارد
- اقدام بعدی چیست؟
- بیمار را بستری و آنتی بیوتیک تزریقی شروع می کنیم
- آنتی بیوتیک خوراکی شروع می کنیم
- دوز داروهای سرکوبگر ایمنی را کاهش می دهیم
- هیچکدام



CLINICAL SIGNIFICANCE

- Asymptomatic bacteriuria is a common clinical condition that often leads to unnecessary treatment.
- Asymptomatic bacteriuria should be screened for and treated only in pregnant women or in individuals prior to undergoing invasive urologic procedures.
- Unnecessary treatment is associated with consequences including symptomatic *Clostridioides difficile* infection, increased antimicrobial resistance, and health care cost.
- Many interventions have shown effectiveness in reducing the rate of unnecessary asymptomatic bacteriuria treatment.

Asymptomatic Bacteriuria

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Asymptomatic bacteriuria, defined as the presence of bacteria in the urine in the absence of urinary symptoms, is a common clinical finding that often warrants a decision about whether to initiate antimicrobial therapy. There are few indications to treat asymptomatic bacteriuria, and inappropriate treatment contributes to the development of antimicrobial resistance. In 2019, the Infectious Diseases Society of America revised its 2005 guidelines on asymptomatic bacteriuria, incorporating new evidence. The updated guidelines recommend screening and appropriate treatment for asymptomatic bacteriuria in pregnant women and in individuals undergoing endourological procedures associated with mucosal trauma. The guidelines recommend against screening and treatment in infants and children; healthy adults, including nonpregnant pre- and postmenopausal women; and patients with diabetes mellitus, long-term indwelling catheters, or spinal cord injuries. The guidelines also recommend against screening and treatment in patients undergoing nonurological surgery, patients who have had a kidney transplant more than one month prior, recipients of other solid organ transplants, or those with impaired voiding following spinal cord injury. Although delirium in older adults can be caused by a urinary tract infection, the guidelines recommend that patients with delirium and no urinary or systemic symptoms be assessed for other causes of delirium, rather than initiating treatment for asymptomatic bacteriuria, because treatment has not been shown to have any beneficial effect on clinical outcomes. (*Am Fam Physician*. 2020;102(1):99-104. Copyright © 2020 American Academy of Family Physicians.)

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BEST PRACTICES IN INFECTIOUS DISEASE

Recommendations from the Choosing Wisely Campaign

Recommendation	Sponsoring organization
Avoid the use of surveillance cultures for the screening and treatment of asymptomatic bacteriuria.	American Academy of Pediatrics
Do not treat asymptomatic bacteriuria with antibiotics.	Infectious Diseases Society of America
Do not use antimicrobials to treat bacteriuria in older adults unless specific urinary tract symptoms are present.	American Geriatrics Society
Do not perform urinalysis, urine culture, blood culture, or <i>Clostridioides difficile</i> testing unless patients have signs or symptoms of infection. Tests can be falsely positive, leading to overdiagnosis and overtreatment.	Society for Healthcare Epidemiology of America
Do not obtain a urine culture unless there are clear signs and symptoms that localize to the urinary tract.	American Medical Directors Association
Do not prescribe antimicrobials to patients using indwelling or intermittent catheterization of the bladder unless there are signs and symptoms of urinary tract infection.	American Urological Association

Source: For more information on the Choosing Wisely Campaign, see <https://www.choosingwisely.org>. For supporting citations and to search Choosing Wisely recommendations relevant to primary care, see <https://www.aafp.org/afp/recommendations/search.htm>.

Prevalence of Asymptomatic Bacteriuria in Different Populations

Population	Prevalence (%)
Children	
Boys	Less than 1
Girls	1 to 2
Healthy women	
Premenopausal	1 to 5
Pregnant	1.9 to 9.5
Postmenopausal (50 to 70 years of age)	2.8 to 8.6
People with diabetes mellitus	
Women	10.8 to 16
Men	0.7 to 11
Older adults in long-term care facilities	
Women	25 to 50
Men	15 to 50
People with spinal cord injury	
Intermittent catheter use	23 to 69
Sphincterotomy/condom catheter	57
People with kidney transplant	
First month posttransplant	23 to 24
One month to one year posttransplant	10 to 17
More than one year posttransplant	2 to 9
People with an indwelling catheter	
Long term (30 days or more)	100
Short term (less than 30 days)	3 to 5 per day the catheter is present

Adapted with permission from Nicolle LE, Gupta K, Bradley SF, et al. Clinical practice guideline for the management of asymptomatic bacteriuria: 2019 update by the Infectious Diseases Society of America. Clin Infect Dis. 2019;68(10):e87.

Diagnostic Criteria for Asymptomatic Bacteriuria

Midstream clean-catch urine in patients without indwelling catheters or signs and symptoms of UTI

Women: two consecutive specimens, preferably within two weeks of each other, with one bacterial species isolated in quantitative counts of at least 100,000 CFUs per mL of urine

Men: a single specimen with one bacterial species isolated in a quantitative count of at least 100,000 CFUs per mL of urine

Patients with indwelling catheters and no signs or symptoms of UTI

Newly inserted catheter or in-and-out catheterization: in women or men, a single specimen with one bacterial species isolated in a quantitative count of at least 100 CFUs per mL of urine

Long-term catheterization: in women or men, a single specimen with one bacterial species isolated in a quantitative count of at least 100,000 CFUs per mL of urine

CFUs = colony-forming units; UTI = urinary tract infection.

Information from reference 2.

SORT: KEY RECOMMENDATIONS FOR PRACTICE

Clinical recommendation	Evidence rating	Comments
Healthy nonpregnant premenopausal women should not be screened or treated for asymptomatic bacteriuria. ²⁻⁵	B	Observational studies, randomized controlled trials, expert opinion, and clinical guidelines
Pregnant women should be screened for asymptomatic bacteriuria early in pregnancy and treated appropriately. ^{2,6-8}	B	Consistent, good-quality patient-oriented evidence from the Infectious Diseases Society of America, the U.S. Preventive Services Task Force, and a Cochrane review.
Older patients with functional or cognitive impairment and bacteriuria but no systemic signs of infection (e.g., genitourinary symptoms, fever, hemodynamic instability) who experience delirium or a fall should be assessed for other causes of delirium along with careful observation, rather than being treated with antimicrobials. ^{2,11-13}	B	No studies of the benefits of screening and treatment in this population are available; recommendation based on lower-quality studies and clinical guideline
Patients with diabetes mellitus should not be screened or treated for asymptomatic bacteriuria. ^{2,14-16}	B	Multiple studies have shown no benefit
Patients undergoing endourological procedures associated with mucosal trauma (e.g., transurethral surgery; ureteroscopy, including lithotripsy and percutaneous nephrolithotomy) should be screened for asymptomatic bacteriuria before the procedure and treated appropriately. ^{2,21,22}	B	Small randomized trial, case series, and practice guideline

A – consistent, good-quality patient-oriented evidence; **B** – inconsistent or limited-quality patient-oriented evidence; **C** – consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, go to <https://www.aafp.org/afpsort>.

asymptomatic bacteriuria. Whether to screen and treat at the time of catheter removal is a separate area of research, but the evidence is mixed

ADDITIONAL CONSIDERATIONS

Several other patient scenarios may arise for which clinicians might consider screening for

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Recurrent Urinary Tract Infections and Asymptomatic Bacteriuria in Adults

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Abstract

Purpose of review Our goal was to summarize recent evidence regarding recurrent urinary tract infections and asymptomatic bacteriuria in different adult populations.

Recent findings Several research groups are focused on the description of resident bacterial flora in the bladder and urinary dysbiosis in the microbiome era. Even the definitions might change in light of these discoveries. However, the role of urinary microbiome and bacterial interference has still to be determined.

Summary Systematic treatment of asymptomatic bacteriuria is not recommended and even classic indications such as asymptomatic bacteriuria in pregnant women are controversial. In fact, its treatment is associated with a higher probability of symptomatic UTI and a higher prevalence of antibiotic-resistant bacteria. Improving the diagnosis of asymptomatic bacteriuria and optimizing the management of recurrent urinary tract infections, especially through non-antibiotics measures, are needed in order to minimise antimicrobial resistance.

Keywords Urinary tract infections · Asymptomatic bacteriuria · Urinary microbiota · Prophylaxis

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Effect of antibiotic therapy on asymptomatic bacteriuria in kidney transplant recipients

[M Moradi](#), [M Abbasi](#), [A Boskabadi](#), [A Jalali](#)

Urology journal, 2005 · ojs3.sbmu.ac.ir

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Abstract

Purpose: Asymptomatic bacteriuria is a very common complication after kidney transplantation and the need for antibiotic therapy is controversial. The aim of this study was to evaluate the effect of antibiotic therapy on the clinical course of asymptomatic bacteriuria in renal transplant recipients.

Materials and Methods: In the present study, 88 kidney transplant recipients with

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Kidney Transplantation

Effect of Antibiotic Therapy on Asymptomatic Bacteriuria in Kidney Transplant Recipients

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ABSTRACT

Purpose: Asymptomatic bacteriuria is a very common complication after kidney transplantation and the need for antibiotic therapy is controversial. The aim of this study was to evaluate the effect of antibiotic therapy on the clinical course of asymptomatic bacteriuria in renal transplant recipients.

Materials and Methods: In the present study, 88 kidney transplant recipients with asymptomatic bacteriuria were divided into two groups of cases and controls. The patients had been selected from among those with at least 1 year follow-up. In the case group, asymptomatic bacteriuric episodes were treated with antibiotics, and in control group, they were followed without antibiotic therapy. The follow-up period was 9 to 12 months. Bacteriuric episodes, symptomatic urinary tract infection (UTI) episodes, and changes in plasma creatinine level were recorded and compared between the two groups.

Results: The rate of bacteriuric episodes and symptomatic UTIs were not significantly different between the two groups ($P > 0.05$). In addition, level of plasma creatinine did not increase significantly in neither of the groups during the study ($P > 0.05$).

Conclusion: It seems that treatment of asymptomatic bacteriuria in kidney recipients does not decrease the rate of UTI episodes afterwards. Asymptomatic bacteriuria does not affect renal function in short term. Thus, we can abandon antibiotic therapy, subject to careful follow-up.

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ORIGINAL ARTICLE

To treat or not to treat asymptomatic bacteriuria in renal transplant patients, a systematic review

Ahmed Aloufi^{1*}, Faisal Alharthi², Rami Alsuwat²

ABSTRACT

Background: Antibiotic therapy as a preventative measure for asymptomatic bacteriuria (AB) in kidney recipients can be beneficial in reducing subsequent symptomatic infections. Treating AB and acute graft pyelonephritis is crucial for reducing the risk of graft rejection after kidney transplantation. However, the effectiveness of antibiotics in these cases is still debated in the medical community.

Objectives: This review aims to determine the benefits and risks of treating AB in kidney transplant recipients with antimicrobial agents to prevent symptomatic urinary tract infection (UTI) and all-cause mortality.

Methods: The review included 10 articles published from January 2010 to January 2021 which examined the effectiveness of treating AB after renal transplantation.

Results: AB treatment with antibiotics was found to have no benefit in all reviewed studies, as antibiotic treatment of AB increases the emergence of more resistant organisms in urine. During the months of follow-up, it was also a risk factor for UTI.

Conclusion: Sufficient evidence has shown that AB treatment with antibiotics does not provide any significant benefit in the short and long term. Giving these findings, and considering other important treatment options is vital to improve clinical outcomes for this condition.

Keywords: Asymptomatic bacteriuria AB, urinary tract infection, renal transplant recipients.

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6. Moradi M, Abbasi M, Moradi A, Boskabadi A, Jalali A. Effect of antibiotic therapy on asymptomatic bacteriuria in kidney transplant recipients. *Urol J.* 2005;2(1):32–5. PMID:17629893.

Systematic Review

Treatment of Asymptomatic Bacteriuria after Kidney Transplantation: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

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* Correspondence: mnsbzx2019@163.com

Abstract: *Background and Objectives:* Asymptomatic bacteriuria (ASB) is prevalent in kidney transplant recipients (KTRs) and is hypothesized to heighten the risk of subsequent urinary tract infections (UTIs). Whether antibiotic treatment of ASB in KTRs is beneficial has not been elucidated. *Materials and Methods:* We carried out a systematic review and meta-analysis of all randomized controlled trials (RCTs) and quasi-RCTs that examined the merits of managing asymptomatic bacteriuria in KTRs. The primary outcomes were rates of symptomatic urinary tract infections (UTIs) and antimicrobial resistance. *Results:* Five studies encompassing 566 patients were included. No significant difference in symptomatic UTI rates was found between antibiotics and no treatment groups (relative risk (RR) 1.05, 95% confidence interval (CI) = 0.78–1.41), with moderate heterogeneity ($I^2 = 36\%$). Antibiotic treatment was found to present an uncertain risk for the development of drug-resistant strains (RR = 1.51, 95% CI = 0.95–2.40, $I^2 = 0\%$). In all trials, no significant difference between study arms was demonstrated regarding patient and graft outcomes, such as graft function, graft loss, hospitalization due to UTI, all-cause mortality, or acute rejection. *Conclusions:* The practice of screening and treating kidney transplant patients for asymptomatic bacteriuria does not curtail the incidence of future symptomatic UTIs, increase antimicrobial resistance, or affect graft outcomes. Whether early treatment of ASB after kidney transplantation (<2 months) is beneficial requires more RCTs.

Keywords: kidney transplantation; asymptomatic bacteriuria; antibiotic; urinary tract infection



check for updates

Citation: Rao, Z.; Wang, Z.; Tang, M.; Shen, L.; Zhang, K. Treatment of Asymptomatic Bacteriuria after Kidney Transplantation: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Medicina* **2023**, *59*,

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- عوارض آنتی بیوتیک درمانی در باکتریوری بی علامت

هزینه-

C. Difficile عوارض توکسیک و کولیت ناشی از –

افزایش مقاومت میکربی –

افزایش بروز عفونت ادراری –

