Midstream Urine (MSU) Testing

1. Asymptomatic bacteriuria in pregnancy: Diagnosis and management in an UK maternity unit

Author(s): Roberts R.; Chan D.; Chiu S.; Teoh T.G.; Hatcher J.; Arulkumaran S.
Source: BJOG: An International Journal of Obstetrics and Gynaecology; Mar 2018; vol. 125; p. 142
Publication Date: Mar 2018
Publication Type(s): Conference Abstract

Abstract: Introduction Asymptomatic bacteriuria defined as positive urine culture in a patient without urinary symptoms, affects between 2 and 10% of pregnancies. If left untreated, 30% of women can develop acute pyelonephritis, as well as lead to significant maternal morbidity. Acute pyelonephritis can also result in spontaneous preterm birth and low birthweight. Despite its clinical importance, current UK advice on routine antenatal screening is inconsistent. The UK National Screening committee concluded that there was insufficient evidence for universal screening, however the National Institute of Clinical Excellence, the Scottish Intercollegiate Guidelines Network and the Royal College of Pathologists do recommend routine screening in early pregnancy. Imperial College Healthcare NHS Trust, London, UK does not currently have local guidelines on screening and treating asymptomatic bacteriuria. Methods Current management of urinary tract infections (UTI) in pregnancy was audited against standards published by the Royal College of Pathologists. Medical notes for 50 women at the end of their pregnancies were analysed by two obstetric trainees at St Mary’s Hospital, UK. Results A mid-stream urine (MSU) sample was cultured following the first antenatal visit in 8/50 (16%) women. There was positive bacterial growth in 3/8 samples (37%), with one patient being appropriately treated for Escherichia Coli; the remaining two samples were bacterial contaminants. A test of cure following antibiotic treatment with a repeat midstream urine culture was not performed. There is still routine use of nitrites and leucocytes in urine dipstick testing despite national advice in the absence of urinary symptoms to dipstick for glucose and protein only. In total for 50 pregnancies, 44 midstream urine cultures were performed, but only 2 patients (5%) had urinary symptoms. Contaminants were found in 11/44 (25%) of samples, with the most common contaminants being yeast, mixed bacterial growth and Enterococci. Due to the high rate of bacterial contaminants, a patient information poster to improve patient collection of a MSU sample was designed. This will be displayed in maternity clinical areas to improve successful clean collection of samples. Conclusion Screening for asymptomatic bacteriuria at the antenatal booking is now recommended at our Trust. We anticipate that the patient information poster for MSU collection will reduce contaminants, and this will be re-audited. A pregnancy specific management pathway covering MSU testing, treatment of UTI, differentiating pathogens and contaminants, and performing a test of cure is in publication. This will standardise care within our Hospital Trust.

Database: EMBASE
2. Asymptomatic bacteriuria in pregnant women attending Boo-Ali Hospital Tehran Iran: Urine analysis vs. urine culture.

Author(s): Etminan-Bakhsh, Mina; Tadi, Sima; Darabi, Roksana

Source: Electronic physician; Nov 2017; vol. 9 (no. 11); p. 5760-5763

Publication Date: Nov 2017

Publication Type(s): Journal Article

PubMedID: 29403616

Available at Electronic Physician - from Europe PubMed Central - Open Access

Abstract: Background Asymptomatic bacteriuria is one of the common problems in pregnancy. Asymptomatic bacteriuria is associated with pyelonephritis, preterm labor and low birth weight infants. The physiological and anatomical changes in pregnancy facilitate urinary tract infection (UTI) during pregnancy. Several tests are available for diagnosis of asymptomatic bacteriuria. The urine culture is a gold standard diagnostic test for asymptomatic bacteriuria but it is expensive and time-consuming. Screening methods may be useful in detecting high-risk pregnant women for asymptomatic bacteriuria. Objective The aim of the present study was to compare urine analysis as a rapid screening test to urine culture in diagnosis of asymptomatic bacteriuria. Methods A total of 123 pregnant women attending the obstetrics clinic of Boo-Ali hospital in Tehran, Iran from March 2013 to September 2014 were included in the present diagnostic cross-sectional study. One hundred twenty three mid-stream urine samples were inoculated into cultures and were processed by dipstick (nitrite test and leucocyte esterase test) and microscopic pus cell count. The sensitivity, specificity, positive predictive value and negative predictive value of nitrite test, leucocyte esterase test and microscopic pus cell count were compared with urine culture in diagnosis of asymptomatic bacteriuria by using SPSS version 19. Results Of 123 urine samples, significant asymptomatic bacteriuria (≥10^4 cfu/ML) was detected in 8 (6.5%) subjects. The sensitivity and specificity of nitrite test were 37% and 100% respectively. The sensitivity of pus cell count alone and leucocyte esterase test alone were 100% but the specificity of them were 64% and 65% respectively. We found high negative predictive value by Pus cell count and the leucocyte esterase test (100%) and low positive predictive value by them (16% and 17% respectively). Conclusion Urine culture is the most useful test for diagnosis of asymptomatic bacteriuria. None of our screening tests had a sensitivity and specificity of 100%, whereas we can only refer the pregnant women with positive leucocyte esterase test and significant pyuria to the urine culture.

Database: Medline
3. Diagnostic performance of reagent strip testing for antenatal screening of asymptomatic bacteriuria using single- and double-urine culture criteria

Author(s): Kovavisarach E.; Romyen S.; Kanjanahareutai S.

Source: Journal of the Medical Association of Thailand; Oct 2017; vol. 100 (no. 10); p. 1045-1049

Publication Date: Oct 2017

Publication Type(s): Article

Abstract: Objective: To determine the prevalence of asymptomatic bacteriuria (ABU) in pregnant women and diagnostic performance of reagent strip test for screening of ABU using single and double urine culture criteria. Material and Method: Pregnant women attending their first antenatal care at Rajavithi Hospital Bangkok, between August 22 and November 4, 2011 were enrolled to collect clean-catch midstream urine for reagent strip test and culture on blood and MacConkey agar plates. The second urine culture was collected only from participants who had the first positive urine culture. Results: Sixty-one of the 754 cases (8.1%) got the positive first urine culture. Twenty of the sixty-one cases were still positive urine culture in the second culture. Therefore, prevalence of ABU was 8.1% and 2.7% using single and double urine culture as gold standard. Escherichia was the most common pathogen in both single and double urine culture (27.9% and 40%, respectively). The urine dipstick nitrite, leukocyte, and both test by using double urine culture had a sensitivity of 35.0%, 50.0%, and 20.0%, specificity of 86.5%, 52.2%, and 93.2%, positive predictive value (PPV) of 6.6%, 2.8%, and 7.4%, and negative predictive value of 98.0%, 97.5%, and 97.7%, respectively. All diagnostic performances of double-urine culture were comparable with single-urine culture except marked worse PPV. Conclusion: Prevalence of ABU in pregnant women was decreased from 8.1 to 2.7% using single and double culture as gold standard. Reagent strip testing is not sensitive for screening of ABU; either single or double urine culture were used as gold standard. Copyright © 2017, Medical Association of Thailand. All rights reserved.

Database: EMBASE
4. Predictive role of proteinuria in urinary tract infection

**Author(s):** Bharara T.; Gur R.; Duggal S.D.; Jena P.P.; Kumar A.; Sharma A.

**Source:** Journal of Clinical and Diagnostic Research; Oct 2017; vol. 11 (no. 10)

**Publication Date:** Oct 2017

**Publication Type(s):** Article

**Abstract:** Introduction: Urine culture is considered as Holy Grail in diagnosis of Urinary Tract Infection (UTI). However, the significance of preliminary urinalysis cannot be neglected. Aim: To evaluate proteinuria as a predictor of UTI. Materials and Methods: This study was conducted at the Department of Microbiology, Dr. Baba Saheb Ambedkar Hospital, New Delhi, India, over a period of three months (April 2015 to June 2015). Urine specimens from clinically suspected cases of UTI were analysed microscopically for pyuria and by reagent strip test for albuminuria. The results were correlated with urine culture findings. Antimicrobial resistance for various antimicrobials was compared among proteinuria positive and negative cases. Statistical analysis was done by Fisher’s-exact test and p-value was calculated. A p-value <=0.05 was considered significant. Results: A total of 369 urine samples received for both routine microscopy and culture, out of which 73 were proteinuria positive. And, out of these 73 samples, 32 were culture positive while 41 were culture negative. Among culture positive, 65.6% patients were symptomatic (21/32) while 34.4% were asymptomatic (11/32). Their age ranged from 5 months to 83 years. Male to female ratio was 1:1.5. Association between culture positivity and proteinuria was statistically significant (p<0.001) with 43.8% positive predictive value. Pyuria was observed in 42.5% cases. Out of 296 proteinuria negative samples, 36 were culture positive. beta-lactam antibiotic resistance among proteinuria positive cases while chloramphenicol resistance among proteinuria negative cases was significantly high.

**Conclusion:** Proteinuria as a urinalysis parameter may have good predictive power combined with the clinical presentation to diagnose UTI. Copyright © 2017, Journal of Clinical and Diagnostic Research. All rights reserved.

**Database:** EMBASE

5. Do pregnant women with asymptomatic bacteriuria need treatment?

**Author(s):** Chang W.-H.; Yeh C.-C.; Wang P.-H.

**Source:** Taiwanese Journal of Obstetrics and Gynecology; Oct 2017; vol. 56 (no. 5); p. 583-584

**Publication Date:** Oct 2017

**Publication Type(s):** Editorial

**Available at:** Taiwanese journal of obstetrics & gynecology - from Free Medical Journals . com

**Available at:** Taiwanese journal of obstetrics & gynecology - from ScienceDirect

**Database:** EMBASE
6. Early screening and treatment of asymptomatic bacteriuria during pregnancy

Author(s): Lkhamsuren T.

Source: Journal of Obstetrics and Gynaecology Research; Jun 2017; vol. 43; p. 195-196

Publication Date: Jun 2017

Publication Types: Conference Abstract

Available at The journal of obstetrics and gynaecology research - from Wiley Online Library Science, Technology and Medicine Collection 2017

Abstract: Background: Bacteriuria is defined as the presence of >=105 colonies of a single pathogen per milliliter of urine. Urinary tract infections (UTI) are the most common bacterial infections of pregnancy. Asymptomatic bacteriuria (ASB), occurring in 2-11% of pregnancies, is a major predisposition to the development of pyelonephritis, which is associated with obstetrical complication, such as preeclampsia, anemia, preterm labor and low birth weight in infants. Untreated, ASB is found to be associated with subsequent pyelonephritis and it is has been shown that pyelonephritis diagnosed in 70-80% in Mongolian pregnant women. However there is no statistic data on asymptomatic bacteruria during pregnancy in Mongolian context.

Objectives: To define the outcome of early screening and treatment of ASB during pregnancy.

Materials and methods: We conducted a cross sectional study among 699 women of 12-16 weeks of gestation who come for antenatal visit. Pregnant women from 6 districts of Ulaanbaatar and randomly selected 3 provinces were invited to our study between 2009 and 2011. Urine samples were collected according to standard method and leukocyte esterase (LE) test was performed to detect urine white blood cells. All samples positive for LE test were send to bacteriology laboratory for further bacterial detection and antibiotic sensitivity test. Treatment efficacy was defined after 5-7 days of antibiotic administration. Statistical analysis performed by using Stata 9.0.

Result: Among 699 women included 73 (10.4%) had ASB and 38 (52.0%) were from rural area. Those women with low educational level had greater risk of having ASB (OR 1.9; 95% CI 1.14-3.05, p=0.011) Concerning to reproductive health problems, women with ASB had irregular menstrual cycle (p=0.025), chronic urinary tract diseases (p = 0.001), urinary incontinence (p<0.0001), constipation (p<0.0001), abnormal vaginal discharge during gynecologic examination (p<0.0001), respectively. Of 73 cases positive for LE test, in 52 (71.2%) detected E. coli, in 13 (17.8%) Staphylococcus, in 4 (5.4%) Streptococcuspyogenes, in 3 (4.1%) Klebsiellapp, and in 1 (1.7%) case we found gram positive bacteria. 57 (85%) were most sensitive to ampicillin, 6 to cephalozin 2 to gentamycin, 6 to cephalozin, 2 to gentamycin, 2 to ceftriaxone and 7 to nitrofuranc, respectively. All result became normal after 5-7 days of sensitive antibiotic therapy.

Conclusion: We found SSB in 10.4% among pregnant women that was similar to other studies. Several factors, including educational level, lifestyle, and environmental status were associated to this disease. LE test appears to be effective in screening ASB during pregnancy. E. coli is found to be the most frequent isolate, and treating women for 5-7 days by most sensitive antibiotic is efficient in preventing further recurrence.

Database: EMBASE
7. Asymptomatic pyuria in pregnant women during the first trimester is associated with an increased risk of adverse obstetrical outcomes

Author(s): Lai Y.-J.; Hsu T.-Y.; Lan K.-C.; Lin H.; Ou C.-Y.; Fu H.-C.; Tsai C.-C.

Source: Taiwanese Journal of Obstetrics and Gynecology; Apr 2017; vol. 56 (no. 2); p. 192-195

Publication Date: Apr 2017

Publication Type(s): Article

PubMedID: 28420507

Available at Taiwanese Journal of Obstetrics & Gynecology - from Free Medical Journals . com
Available at Taiwanese Journal of Obstetrics & Gynecology - from ScienceDirect

Abstract:Objective Urinalysis is included in the prenatal examination in the first trimester in Taiwan, in contrast to Western countries. We aimed to investigate whether asymptomatic pyuria as detected by urinalysis was associated with adverse perinatal outcomes. Materials and Methods A total of 1187 singleton pregnant women who received prenatal care at Kaohsiung Chang Gung Memorial Hospital between January 2012 and December 2013 were included for retrospective analysis. We defined asymptomatic pyuria as the presence of 15 or more white blood cells/µL in midstream urine without symptoms. Adverse perinatal outcomes including preterm delivery, preterm premature rupture of membrane, low birth weight, and Apgar scores were analyzed. Univariate and multivariate logistic regression analyses were used to identify independent predictors. Results The prevalence of asymptomatic pyuria was 21.3% in our cohort. Univariate analysis showed that pyuria was the only factor associated with preterm delivery before 36 weeks of pregnancy, preterm premature rupture of membrane, and low birth weight. In multivariate analysis, both pyuria (odds ratio: 4.89, 95% confidence interval: 1.80-13.25, p = 0.002) and a maternal age of 35 years or older (odds ratio: 3.46, 95% confidence interval: 1.11-10.78, p = 0.033) were significant independent predictors for a low 5 minute Apgar score (<7). Conclusion The identification of asymptomatic pyuria via urinalysis in the first trimester may be a predictor for adverse perinatal outcomes.Copyright © 2017

Database: EMBASE
8. Do we really need to send an MSU?

Author(s): Rooke B.; Baker A.; Barrett S.

Source: Sexually Transmitted Infections; 2016; vol. 92

Publication Date: 2016

Publication Type(s): Conference Abstract

Abstract: Background/introduction Midstream urine (MSU) results create a significant workload for our clinic. MSU can diagnose urinary tract infection (UTI), but detecting asymptomatic bacteriuria or contaminants confuses management. Lower UTI is common in non-pregnant women, but MSU is unnecessary as UTI can be diagnosed clinically. Local guidelines identified four indications for MSU: women with dysuria and loin pain, urinary symptoms in pregnancy, men with dysuria and frequency/urgency, and epididymo-orchitis. Aim(s)/objectives To assess whether MSU is requested for appropriate indications, and to evaluate the usefulness of MSU in diagnosing and managing patients in a sexual health clinic. Methods Retrospective case note review of 100 MSU requests at a sexual health clinic between 2014 and 2015. The associated clinic presentations and culture results were identified. Results 14% of MSU were requested within guidelines. 29% (4/14) of those were positive, compared to 22% (19/86) not requested within guidelines. Indications outside guidelines associated with positive culture included: women with lower urinary tract symptoms (11), men with dysuria only (3), pelvic inflammatory disease (2), asymptomatic with positive urine dipstick (2), and vaginal discharge (1). 15/23 were sensitive and 8/23 were resistant to trimethoprim.

Discussion/conclusion MSU is often requested inappropriately. This generates positive results associated with clinical presentations unlikely to indicate UTI. Greater awareness amongst clinicians of appropriate indications for MSU will support optimal resource utilisation in sexual health clinics. Resistance to our first line antibiotic, trimethoprim, was identified. Resistance patterns should be monitored so clinicians can confidently prescribe empirical treatment for lower UTI in nonpregnant women.

Database: EMBASE
OBJECTIVE To estimate the accuracy of onsite tests to detect asymptomatic bacteriuria among pregnant women.

DATA SOURCES We searched MEDLINE, EMBASE, Web of Science, Scopus, and Latin-American Literature from inception until June 2015 without language restrictions. The ClinicalTrials.gov register database was screened to identify any recently completed studies.

METHODS OF STUDY SELECTION Two independent reviewers selected studies that recruited asymptomatic pregnant women to evaluate the accuracy of onsite tests in detecting the presence of bacteria in the urine using urine culture as a reference standard.

TABULATION, INTEGRATION, AND RESULTSWomen’s characteristics, study design, urine sample collection, and handling were extracted along with the test accuracy data. Where possible, we pooled the data using a bivariate, hierarchical random-effects model. Of 1,360 screened references, 27 articles (13,641 women) with test accuracy data on nine tests met the inclusion criteria. The most commonly evaluated test was urine dipstick. The pooled sensitivity and specificity of nitrites detected by dipstick to detect asymptomatic bacteriuria were 0.55 (95% confidence interval [CI] 0.42-0.67) and 0.99 (95% CI 0.98-0.99), respectively. The Griess test to detect nitrites had a sensitivity of 0.65 (95% CI 0.50-0.78) and specificity of 0.99 (95% CI 0.98-1.00). Dipslide with Gram staining had a pooled sensitivity of 0.86 (95% CI 0.80-0.91) and specificity of 0.97 (95% CI 0.93-0.99).

CONCLUSION The specificity of onsite tests is high; however, the sensitivity is not with the result that they will fail to detect a substantial number of cases of asymptomatic bacteriuria.

CLINICAL TRIAL REGISTRATION PROSPERO International prospective register of systematic reviews, http://www.crd.york.ac.uk/PROSPERO/, CRD42015027905.
10. Contribution of neutrophil activation in the differentiation of urine infection and contamination in pregnant women.

**Author(s):** Şahin, Kazım; Dilek, Aziz Ramazan; Güvendağ Güven, Emine Seda; Yazıcı, Zihni Açar

**Source:** Gynecologic and obstetric investigation; 2015; vol. 80 (no. 2); p. 124-127

**Publication Date:** 2015

**Publication Type(s):** Journal Article

**PubMedID:** 25998166

Available at Gynecologic and obstetric investigation - from ProQuest (Hospital Premium Collection) - NHS Version

**Abstract:** Urinary tract infections are among the most common bacterial infections of humans. Urine culture is the gold standard for asymptomatic bacteriuria and pyuria is not always present in bacteriuria, nor is it specific for bacteriuria.

**OBJECTIVE**

The aim of the present study was to determine neutrophil activation and the contributions of this activation in the differentiation of infection and contamination.

**METHODS**

The serum and urine myeloperoxidase (MPO) levels of 50 pregnant females with symptoms suggesting UTI and 25 healthy non-pregnant control subjects were measured using the enzyme-linked immunosorbent assay (ELISA) method and the obtained values were compared with the results of urine microscopy and urine culture.

**RESULTS**

The leukocyte count in urine was significantly higher in group 1 (infection) and group 2 (contamination) when compared with the control group (group 1 mean: 18.2; group 2 mean: 14.2; control mean: 4.8; ANOVA test, p ≤ 0.00). According to the obtained ELISA values, a statistical difference in the levels of urine MPO between the patient and control groups was seen (p ≤ 0.00). There was no statistical difference among the groups for serum MPO levels (p ≥ 0.451).

**CONCLUSION**

The study findings suggest that standardized measurement techniques such as dipstick screening assay for urine MPO level may be useful in differentiating infection and contamination, especially in pregnant patients.

**Database:** Medline
11. Association between Asymptomatic Bacteriuria and Pre-Eclampsia.

**Author(s):** Rezavand, Negin; Veisi, Firooze; Zangane, Mrayam; Amini, Roghaye; Almasi, Afshin

**Source:** Global journal of health science; Dec 2015; vol. 8 (no. 7); p. 235-239

**Publication Date:** Dec 2015

**Publication Type(s):** Journal Article

**PubMedID:** 26925912

Available at [Global Journal of Health Science](https://www.globaljournalofhealthscience.com) - from Europe PubMed Central - Open Access

**Abstract:** Asymptomatic bacteriuria is one of the most common and important bacterial infections during pregnancy and can result in progressive infections and endanger maternal as well as fetal health. In this study, we assessed the relationship between asymptomatic bacteriuria and pre-eclampsia. In this case-control study, pregnant women who presented to Imam Reza Hospital in Kermanshah in 2013-14 were studied. The minimum sample size was calculated as 125 pregnant women in each group with a total of 250 subjects. There were 125 women with pre-eclampsia and 125 women without pre-eclampsia (control group). Matching was done for age, gestational age, and parity between case and control groups. Matching was verified by a P value of 0.061 for maternal age and gestational age and 0.77 for parity. The statistical analyses were done by applying the chi-squared test and determining odds ratio (OR) for having bacteriuria in univariate logistic regression as well as multivariate regression with adjusting the effect of maternal age, gestational age, and parity. Pyuria and bacteriuria were significantly more common in pre-eclampsia group than in control group. The results showed that a significant association existed between asymptomatic bacteriuria and pre-eclampsia. The rate of asymptomatic bacteriuria was 6.8 times higher in women with pre-eclampsia compared to those without pre-eclampsia. Further studies are required for better clarification of association between asymptomatic bacteriuria and pre-eclampsia.

**Database:** Medline
12. Asymptomatic bacteriuria in women attending an antenatal clinic at a tertiary care centre

Author(s): Titoria A.; Gupta A.; Rathore A.M.; Prakash S.K.; Rawat D.; Manaktala U.

Source: South African Journal of Obstetrics and Gynaecology; 2014; vol. 20 (no. 1); p. 4-7

Publication Date: 2014

Publication Type(s): Article

Available at South African Journal of Obstetrics and Gynaecology - from Free Medical Journals . com

Abstract: Objective. To compare the diagnostic performance of urine microscopy, leucocyte esterase and nitrite dipstick tests and various combinations of these as screening tests for asymptomatic bacteriuria in pregnancy. Methods. Pregnant women (N=800) attending an antenatal clinic were recruited at their first visit. Urine microscopy, culture and dipstick testing were performed on a random clean-catch midstream urine sample. A count of >105 colony-forming units of a single organism per millilitre of urine was taken as significant. Dipstick results were read as positive according to the manufacturer’s instructions. Results. A total of 800 eligible women were screened. The prevalence of asymptomatic bacteriuria as diagnosed by urine culture was 5.0% (n=40). Escherichia coli was the most prevalent uropathogen isolated by culture (60.0%). Neither urine microscopy nor the leucocyte test was found to be sufficiently sensitive to be used as a single screening test for asymptomatic bacteriuria in pregnant patients. The nitrite test alone had a sensitivity of 82.5% and a specificity of 99.9%. Combined dipstick testing had an improved sensitivity of 87.3% and a specificity of 96.2%. Addition of urine microscopy to combined dipstick testing increased the sensitivity to 95.0%, and the specificity became 92.4%. Conclusion. Combined dipstick testing is a useful screening test for asymptomatic bacteriuria in pregnancy. Addition of urine microscopy to combined dipstick testing further improves its diagnostic performance.

Database: EMBASE
13. A service project on mid-stream urine cultures performed in routine antenatal visits

**Author(s):** Elangovan V.

**Source:** BJOG: An International Journal of Obstetrics and Gynaecology; Nov 2014; vol. 121; p. 19

**Publication Date:** Nov 2014

**Publication Type(s):** Conference Abstract


**Abstract:** Introduction: Asymptomatic bacteriuria during pregnancy must be detected and treated in due time because it can lead to potentially severe consequences both economically and medically. This project was structured around NICE clinical guideline 62 and SIGN. After the first antenatal booking appointment, it is not necessary to perform repeat urine cultures on patients who do not have bacteriuria in the first trimester. As part of routine antenatal care, urine analysis is performed during every visit. Dipstick testing is the first step in analysis. My aim is to derive a new criterion for the urine samples (MSUs) that should be sent off for a culture. The number of unnecessary urine cultures performed being minimised could mean a large cost and time saving for NHS every year.

**Methods:** Data were collected from 199 patients who visited the antenatal clinic at RPH during the period of 13/12/2013 to 10/1/2014. Any significant bacteria growth was recorded when these urine cultures were performed. The past medical history of these patients was identified using the Quadramed and Evolve system on the intranet at RPH. Patients who had a history of renal disease, diabetes mellitus or recurrent UTIs were placed on a separate high risk category. In terms of investigations, significant interest was placed on kidney ultrasounds. Apart from previously mentioned screening guidelines, an advanced search on PubMed for research done on predisposing factors to UTIs in pregnancy was performed. The literature was based primarily on three systematic review articles published after 2008 out of which 1 was by the Cochrane collaboration. Conceptual understanding of the medicine behind this project was from a medical microbiology textbook.

**Database:** EMBASE
Diagnostic accuracy of rapid urine dipstick test to predict urinary tract infection among pregnant women in Felege Hiwot Referral Hospital, Bahir Dar, North West Ethiopia.

Author(s): Demilie, Tazebew; Beyene, Getenet; Melaku, Selabat; Tsegaye, Wondewosen

Source: BMC research notes; Jul 2014; vol. 7 ; p. 481

Publication Date: Jul 2014

Publication Type(s): Research Support, Non-u.s. Gov't Journal Article

PubMedID: 25073620

Available at BMC Research Notes - from BioMed Central

Abstract: BACKGROUND: Untreated bacteriuria during pregnancy has been shown to be associated with low birth-weight and premature delivery. Therefore, routine screening for bacteriuria is advocated. The decision about how to screen pregnant women for bacteriuria has always been a balance between the cost of screening versus the sensitivity and specificity. This study was designed to evaluate the diagnostic accuracy of the rapid dipstick test to predict urinary tract infection in pregnancy against the gold standard urine culture.

METHOD: A total of 367 mid stream urine samples were collected, inoculated on MacConkey, Manitol salt agar (MSA) and blood agar and incubated aerobically at 37°C for overnight. Specimens were classified as "positive" for urinary tract infection (UTI) if the growth of the pathogen(s) was at a count ≥ 10^5 colony-forming units per milliliter (cfu/mL) of urine and classified as "negative" with growth of <10^5 cfu/mL. Urine samples were tested for the presence of nitrite and leukocyte esterase using dipstick rapid test in accordance to the manufacturer's instructions.

RESULTS: From the total study participants, 37 pregnant women were symptomatic and the remaining 330 pregnant women were asymptomatic. The sensitivity and specificity of dipstick tests of leukocyte esterase was 50% and 89.1% for pregnant women with asymptomatic UTI (ABU) and 71.4% and 86.7% for symptomatic UTI respectively and for nitrite 35.7% and 98.0% for ABU and 57.1% and 96.7% symptomatic UTI.

CONCLUSION: This study revealed that the use of dipstick leukocyte esterase and nitrite for screening UTI particularly asymptomatic bacteriuria was associated with many false positive and negative results when it was compared against the gold standard culture method. The low sensitivity and positive predictive value of urine dipstick test proved that culture should be used for the diagnosis of UTI.

Database: Medline
15. Management of bacterial UTI in pregnancy

Author(s): Bapir M.; Hartis R.; Gouk E.

Source: BJOG: An International Journal of Obstetrics and Gynaecology; Apr 2014; vol. 121; p. 233

Publication Date: Apr 2014

Publication Type(s): Conference Abstract

Available at BJOG: An International Journal of Obstetrics & Gynaecology - from Wiley Online Library Science, Technology and Medicine Collection 2017

Abstract:
Introduction Urinary tract infection (UTI) is the most common bacterial infection across all age groups. Incidence in pregnancy 8%. 2-9% of pregnant women are bacteriuric in the first trimester and 10-30% of women with bacteriuria in first trimester develop upper urinary tract infection in second and third trimester. The National Institute for Health and Care Excellence (NICE) recommends women should be offered routine screening for asymptomatic bacteriuria (ASB) by midstream urine culture (MSU) at booking, confirm the presence of bacteriuria in urine with a second urine culture, if positive treat with antibiotics for 7 days and repeat MSU 7 days after completion of antibiotics as test of cure. The aim of our audit was to review the indication for sending MSU in antenatal clinic and day assessment unit, to compare our current practice to NICE and Scottish Intercollegiate Guidelines Network (SIGN) guidelines and to assess the cost of our current practice. Methods Prospective audit conducted between June to July 2013 at University Hospital of North Tees and Hartlepool NHS trust. Data collected from register book including reasons for sending urine for culture (booking, symptomatic or positive dipsticks) and results of MSU chased. Total 141 MSU were sent during that period. Results The reasons for sending MSU were positive urine dipstick 116/141, booking 11/141, symptom alone 4/141, symptomatic and had positive dipstick 5/141. Other 5 patients had MSU sent due to history of recurrent UTI, previous mixed growth and blood pressure profile. 127/141 patients had negative MSU, only 7/141 had positive MSU, 5/141 had mixed growth and no result was found for 2 patients. Only 4/7 patients with positive MSU had repeat MSU as a test of cure in 7 days after treatment. 4/5 patients with mixed growth had repeat MSU. The cost of our current practice calculated and we found that if we comply with national standards and use albustick rather than multi-reagent dipsticks significant saving will be achieved. Conclusion NICE and SIGN guidelines recommend women should be offered routine screening for ASB by midstream urine culture (MSU) in first trimester and patients who do not have positive MSU at booking does not require repeat MSU sample unless symptomatic. Urine dipstick have low sensitivity and specificity compare to urine MSU in detecting bacteruria in pregnancy, and this is shown in our result as majority of MSU were sent for positive dipstix 116 patients but only 4 patients had positive culture.

Database: EMBASE
16. Urinary tract infection in pregnancy: How useful are multi-reagent strips in their detection?

Author(s): Badiani S.; Whybrow R.; Jain A.

Source: BJOG: An International Journal of Obstetrics and Gynaecology; Apr 2014; vol. 121; p. 100

Publication Date: Apr 2014

Publication Type(s): Conference Abstract

Available at BJOG: An International Journal of Obstetrics & Gynaecology - from Wiley Online Library Science, Technology and Medicine Collection 2017

Abstract: Introduction It is well documented that one of the principal causes of premature labour in pregnancy is the presence of untreated urinary tract infection (UTI) or asymptomatic bacteriuria, highlighting the paramount importance of early detection and initiation of treatment. The current NICE guidelines for diagnosis of UTI are based upon positive culture results of a midstream urine (MSU) sample. In our Maternal Assessment Unit (MAU), urine samples are sent for microscopy, culture and analysis of sensitivities (MCandS) if the patient has urinary symptoms or if leucocyte esterase, nitrites, protein or blood are detected using a multi-reagent strip. Our study aims to evaluate the correlation between positive multi-reagent strip testing and the positive MSU culture results for detection of UTI and asymptomatic bacteriuria, within our MAU. Methods We performed a prospective analysis of MSU sampling based on NICE guidelines in 100 pregnant patients attending MAU over a 4-week period. Collection of samples and dipstick analysis was performed to evaluate patients for the presence of UTI or asymptomatic bacteriuria. Laboratory analysis of MSU samples by MCandS was performed if dipstick testing confirmed the presence of blood, leucocytes, nitrites or protein. Data were analysed with respect to the presence of symptoms, dipstick testing parameters and MSU culture results in order to assess the efficacy of our current practice in identifying the parameters that best correlate with a positive MSU culture. Results Of the 100 cases identified where MSU sampling was sent for MCandS, 84% were negative. The data collected highlighted proteinuria as the parameter most likely to be positive in the presence of a positive MSU culture (85%) over leucocytes (57%), blood (58%) and nitrites (2%). The patients with a positive MSU culture, without proteinuria, were shown to be symptomatic. In our study, the presence of either proteinuria or symptoms of UTI, if used as indicators for MCandS analysis, would result in 35% less samples sent for culture, yet still detecting all UTI or bacteriuria. Conclusion Though this study consists of a small sample of patients, it demonstrates that in our department, there is a low correlation between multi-reagent strips and positive MSU cultures, accounting for the evident overuse of MSU culture testing. However, we intend to continue this prospective study in order to further validate these results and find the indicators that correlate the most strongly with a positive MSU culture result, inevitably saving valuable time, money and resources.

Database: EMBASE
17. Is a chlorhexidine reaction test better than dipsticks to detect asymptomatic bacteriuria in pregnancy?

**Author(s):** Okusanya, B O; Aigere, E O S; Eigbefoh, J O; Okome, G B O; Gigi, C E

**Source:** Journal of obstetrics and gynaecology : the journal of the Institute of Obstetrics and Gynaecology; Jan 2014; vol. 34 (no. 1); p. 21-24

**Publication Date:** Jan 2014

**Publication Type(s):** Comparative Study Journal Article Observational Study

**PubMedID:** 24359043

**Abstract:** Detection of asymptomatic bacteriuria (ASB) in pregnancy is important to avert the attendant morbidities. Therefore, we assessed the use of chlorhexidine reaction to detect ASB in pregnancy. This was a prospective study, which compared chlorhexidine reaction with dipstick tests and urine culture in 150 asymptomatic pregnant women. Urine cultures detected bacteriuria in seven women (4.7%). Chlorhexidine detected ASB in 72 women (48%) and had sensitivity, specificity and accuracy of 100%, 54% and 56%, respectively. Leucocyte esterase (LE) and nitrite detected bacteriuria in 31 (20.7%) women and 12 (8.0%) women, respectively. Singly, LE had a sensitivity and specificity of 14.3% and 79%, respectively, while nitrite's sensitivity and specificity was 42.9% and 93.7%, respectively. Combined, LE and nitrite had better sensitivity (97.9%) and accuracy (94%). Since the accuracy of chlorhexidine is low, other than urine culture, combined dipstick urinalysis of leucocyte esterase and nitrite tests is good to detect asymptomatic bacteriuria in pregnancy.

**Database:** Medline

18. Idiopathic urinary findings and fetal growth restriction in low risk pregnancy

**Author(s):** Hantush Zadeh S.; Kaviani Jebeli Z.; Shirazi M.; Khosravi D.; Shahbazi F.; Ahmadi F.

**Source:** European Journal of Obstetrics Gynecology and Reproductive Biology; Nov 2013; vol. 171 (no. 1); p. 57-60

**Publication Date:** Nov 2013

**Publication Type(s):** Article

**PubMedID:** 24035321

**Abstract:** Objective To determine whether maternal urinary findings in the first trimester of pregnancy are associated with fetal growth restriction. Study design The prevalence of urinary findings in singleton pregnancies complicated by fetal growth restriction were compared with a low-risk control group of pregnancies who gave birth to normal weight babies, in the same condition. Results There were significant statistical differences in the mean gestational age (p < 0.001), isolated asymptomatic bacteriuria (p < 0.001), hematuria (p = 0.002, OR = 6.6, CI = 1.8-24.2) and proteinuria (p = 0.016, OR = 4.1, CI = 1.2-13.3). There was no recognizable relation between ketonuria and fetal growth restriction. Conclusion Our data showed a relation between the increase of adverse pregnancy outcomes, including fetal growth restriction, and hematuria, proteinuria and asymptomatic bacteriuria. Appropriate monitoring of pregnant women using these findings may be helpful in the identification of more complications. © 2013 Elsevier Ireland Ltd.

**Database:** EMBASE
19. Urinary tract infection and asymptomatic bacteriuria in pregnant women: Causative organisms and antimicrobial sensitivity pattern

Author(s): Guruparan K.; Guruparan L.; Muhunthan K.

Source: BJOG: An International Journal of Obstetrics and Gynaecology; Jun 2013; vol. 120 ; p. 596

Publication Date: Jun 2013

Publication Type(s): Conference Abstract

Abstract: Introduction Urinary tract infection during pregnancy has been proven to be associated with significant maternal and perinatal complications. To prevent that, it has to be treated with most sensitive antimicrobial therapy, which needs the identity of the organism and the antimicrobial sensitivity pattern in the community concerned. A descriptive cross sectional study was carried out in a group of 196 pregnant women presenting to antenatal clinic at teaching hospital Jaffna, Sri Lanka, from April to June 2012, where the practice was to screen antenatal women with urine full report and treat empirically, usually either cephalexin or amoxicillin due to their safety profile.

Objective The objective was to identify the incidence of urinary tract infection both symptomatic and asymptomatic, common causative organisms and the antibiotic sensitivity pattern in the women attending the antenatal clinic.

Methods Samples of mid-stream urine were collected and analysed by direct microscopy and cultured on CLED (cystine lactose electrolyte deficient) media. Antibiotic sensitivity test pattern was done on positive cultures.

Results The prevalence of urinary tract infection was found to be 12% with asymptomatic bacteriuria in 5% of the women attended the antenatal clinic. Coliforms were the common causative organisms, in 87% of the positive cultures. Antimicrobial sensitivity test showed sensitive to nitrofurontoin in 95.7%, cefuroxime in 91.3%, coamoxyclav in 78% and nalidixic acid in 65% of the study population. And resistance to amoxicillin and cephalexin in 56.5% and 83% of the women respectively.

Conclusion From these findings it can be recommended to screen all the pregnant women attending antenatal clinic teaching hospital Jaffna for urinary tract infection as it has been found to be cost-effective if the prevalence rate is >2% and also the antimicrobial therapy should be based on sensitivity pattern than empirically because the commonly prescribed medication such as amoxicillin and cephalexin are found to be resistant.

Database: EMBASE
20. Can the Griess Nitrite test and a Urinary Pus Cell Count of ≥5 cells per micro litre of urine in pregnant women be used for the screening or the early detection of urinary tract infections in rural India?

**Author(s):** Thakre S.S.; Dhakne S.S.; Thakre S.B.; Ughade S.M.; Thakre A.D.; Kale P.

**Source:** Journal of Clinical and Diagnostic Research; Nov 2012; vol. 6 (no. 9); p. 1518-1522

**Publication Date:** Nov 2012

**Publication Type(s):** Article

Available at Journal of clinical and diagnostic research : JCDR - from Europe PubMed Central - Open Access

**Abstract:** Objectives: Urinary Tract Infection (UTI) is a common problem in pregnancy due to the morphological and the physiological changes that take place in the genitourinary tract during pregnancy. Screening methods may be useful, because a full bacteriological analysis could be reserved for those patients who are symptomatic or those who have positive screening test results. The exact prevalence of UTI in rural, pregnant women is unknown. The present study was undertaken to estimate the prevalence of UTI in pregnant women and for ascertaining the utility of the Griess Nitrite test and the Urinary Pus Cell Count of ≥5 cells per micro litre test for the screening or the early detection of UTI in them at primary health care clinics. Occurrence of urinary complaints was compared in UTI and non UTI women. Method: We conducted a study on 300 randomly selected, pregnant women from rural areas. Urine cultures, pus-cell counts and the Griess nitrite test were used for diagnosis of UTI. The screening tests for UTI were evaluated in terms of their sensitivity, specificity, Positive Predictive Value (PPV), Negative Predictive Value (NPV) and the percentage of correctly classified. Results: In the present study, the prevalence of UTI was found to be 29/300 (9.6%, 95% confidence interval 9.57-9.63). The specificities of the two screening tests were comparable (97.05% and 94.47%). Also, the negative predictive values of the two tests were almost similar (97.77% and 96.96%). The percentage of correctly classified by the Griess nitrite test and the urine pus cell count were found to be 95.33% and 92.33% respectively. The proportion of the women with various urinary complaints was significantly higher (P<0.00) in the UTI subjects as compared to that in the non-UTI subjects. Conclusion: Urine culture remains the gold standard for the detection of asymptomatic bacteriuria. The Nitrite test of uncentrifuged urine was observed to be the best among the screening tests which were evaluated in terms of their efficiency and validity.

**Database:** EMBASE
21. Usefulness of dipstick reagent strip for screening of asymptomatic bacteriuria during pregnancy in low resource country

Author(s): Jain V.; Das V.; Agarwal A.; Pandey A.

Source: International Journal of Gynecology and Obstetrics; Oct 2012; vol. 119

Publication Date: Oct 2012

Publication Type(s): Conference Abstract

Available at International Journal of Gynecology & Obstetrics - from Wiley Online Library Science, Technology and Medicine Collection 2017

Abstract: Objectives: To determine the prevalence of asymptomatic bacteriuria (ASB) and sensitivity, specificity, positive as well as negative predictive value of dipstick reagent test (DRT) as a screening tool for ASB during pregnancy in low resource country. Materials: A cross-sectional study was done in department of obstetrics and gynecology, in a tertiary care centre of North India. 650 asymptomatic pregnant women at the first antenatal visit were registered after written and informed consent. Methods: A midstream specimen of urine was obtained in all the subjects, one half was sent for urine culture and sensitivity (105 CFUs/ml of urine is taken as positive) and other half was tested by dipstick reagent strip (which detect nitrite and leucocyte esterase in urine and positive test shows specific colour change in the respective panel). Patients proved to have ASB were treated as per culture sensitivity. Results: In total 109/650 (16.7%) patients were found to have ASB by gold standard urine culture sensitivity test. However, DRT could detect ASB in only 38 of them. The commonest organism found was E. Coli in 37.6% cases. The sensitivity and specificity of either leucocyte esterase and nitrate was found to be 26.6% and 91.5% respectively while the positive and negative predictive values were 38.7% and 86.1% respectively. The diagnostic accuracy of the test was 80.6% with likelihood ratio of 27.9. Conclusions: DRT was found to have low sensitivity, yet it may have utility as a rapid screening test in peripheral centres of resource constrained countries where facilities for culture are not available, owing to its high specificity. However, since the prevalence of ASB was found to be relatively high (~17%), It is suggested that all pregnant women should have urine culture and sensitivity test as a routine to detect ASB at first antenatal visit and prevent the possible maternal and fetal complications even in developing countries.

Database: EMBASE
22. Asymptomatic bacteriuria and antibacterial susceptibility patterns in an obstetric population.

Author(s): Celen, Sevki; Oruç, Ayla Sargin; Karayalçın, Rana; Saygan, Sibel; Unlü, Serpil; Polat, Belgin; Danişman, Nuri

Source: ISRN obstetrics and gynecology; 2011; vol. 2011 ; p. 721872

Publication Date: 2011

Publication Type(s): Journal Article

PubMedID: 21647231

Available at ISRN Obstetrics and Gynecology - from Europe PubMed Central - Open Access

Abstract: Introduction. Asymptomatic bacteriuria (ASB), occurring in 2-11% of pregnancies, is a major predisposition to the development of pyelonephritis, which is associated with obstetrical complications, such as preterm labor and low birth weight infants. The aim of this study was to determine the prevalence of ASB, the antibacterial susceptibilities of the isolated microorganisms and the associated risk factors in an outpatient clinical setting in Zekai Tahir Burak Women's Health Education and Research Hospital in Ankara, Turkey. Material and Methods. Between December 2009 and May 2010, pregnant women admitted to the antenatal outpatient clinic were included in this study. The results of a complete urine analysis, midstream urine culture and antibacterial susceptibility were evaluated. Results. Of the 2011 pregnant women included, 171 had ASB (8.5%). E. coli was the most frequently isolated microorganism (76.6%), followed by Klebsiella pneumonia (14.6%). Both microorganisms were highly sensitive to fosfomycin, sensitivity being 99.2% for E. coli and 88% for Klebsiella pneumonia. Conclusions. In this certain geographical region, we found E. coli as the most common causative agent of ASB in the obstetric population and it is very sensitive to fosfomycin. We recommend fosfomycin for ASB in pregnant women due to its high sensitivity, ease of administration and safety for use in pregnancy.

Database: Medline
23. Asymptomatic bacteriuria in pregnancy: evaluation of reagent strips in comparison to microbiological culture.

**Author(s):** Awonuga, D O; Fawole, A O; Dada-Adegbola, H O; Olola, F A; Awonuga, O M

**Source:** African journal of medicine and medical sciences; Dec 2011; vol. 40 (no. 4); p. 377-383

**Publication Date:** Dec 2011

**Publication Type(s):** Comparative Study Journal Article Evaluation Studies

**PubMedID:** 22783689

**Abstract:** Screening for asymptomatic bacteriuria during pregnancy, the major risk factor for symptomatic urinary tract infection during pregnancy have been recommended. This cross sectional study was conducted to determine prevalence of asymptomatic bacteriuria in Ibadan and evaluate the diagnostic accuracy and relative cost effectiveness of dipstick tests for nitrite and leucocyte esterase in comparison to laboratory culture. Two hundred and five patients, presenting for their first antenatal visit at the University College Hospital, Ibadan, participated in the study. Urine samples obtained from the participants were subjected to two tests; reagent dipstick test for nitrite and leucocyte esterase and routine laboratory culture, which is the gold standard for diagnosis. Main outcome measures were sensitivity, specificity, positive and negative predictive values of the reagent dipstick tests as well as likelihood ratios. The prevalence of asymptomatic bacteriuria in pregnancy with routine laboratory culture and using combined leucocyte esterase and nitrite strip tests were 10.7% and 11.7% respectively. Compared with laboratory culture, combined strip tests had sensitivity, specificity and negative predictive values of 50%, 92.9% and 93.9% respectively, indicating a statistically significant lower level of accuracy (P < 0.05). The corresponding likelihood ratios for positive and negative strip tests (LR+ and LR-) were 7 and 0.5 respectively. The study concludes that combined Leucocyte esterase-nitrite dipstick test is not sufficiently sensitive and specific to be used for routine screening of bacteriuria in pregnancy in place of laboratory culture, though may be more cost effective in low resource settings.

**Database:** Medline
Are we appropriately requesting urine culture on the basis of urine dipstick results in asymptomatic pregnant women?

Author(s): Irshad N.; Darbhamulla A.

Source: Neurourology and Urodynamics; Aug 2011; vol. 30 (no. 6); p. 1125-1126

Publication Date: Aug 2011

Publication Type(s): Conference Abstract

Available at Neurourology and Urodynamics - from Wiley Online Library Science, Technology and Medicine Collection 2017

Abstract:Hypothesis / aims of study To audit whether urine samples testing positive for leucocytes, nitrates, protein, blood or glucose on urine dipstick from asymptomatic pregnant women attending the Antenatal Day Unit are yielding positive results on urine culture. This has cost implications and will be useful in the production of a local guideline for requesting urine culture. Study design, materials and methods Data was collected prospectively from women attending the Antenatal Day Unit for monitoring in the second and third trimester of pregnancy over a 3 week period between February to March 2011. All those who tested positive for a trace or more of leucocytes, nitrates, protein, blood or glucose on urine dipstick had a midstream urine specimen sent for microscopy and culture. The result of the urine specimen was checked on the hospital results reporting system and any urinary tract infection reported was treated with the appropriate antibiotics. Results There were approximately 215 women attending the day unit over the study period. 125 patients had urine sent for culture, 118 results were available. Only 16/118 (13.5%) had a positive urine culture, 13/118 (11%) had mixed growth with no predominant organism and 89/118 (74.4%) cultures showed no growth. The organisms were E. Coli (6/16) Enterococcus sp. (4/16) Coagulase-ve Staph (3/16) Proteus sp. (1/16), Coliforms (1/16) and Group B Streptococcus (1/16). The dipstick results of the (Table presented) There were no positive urine cultures from samples sent with just trace of blood/protein, just blood, just glucose just nitrates, or NAD on dipstick (n=14). 8/16 women testing negative for both nitrates and leucocytes had positive urine cultures. The greatest proportion of urinary tract infections was found in those with proteinuria either alone or in combination with leucocytes on dipstick (13/16) Interpretation of results Sending a urine sample for culture in this asymptomatic pregnant population based on dipstick findings yielded very few positive results. Even those testing positive for leucocytes or nitrates have only a small probability of having a urinary tract infection. Concluding message There needs to be more restricted use of requesting urine culture on the basis of dipstick results for asymptomatic women in the second and third trimester. (Table presented).

Database: EMBASE
Asymptomatic bacteriuria among pregnant women.

**Author(s):** Imade, Paul Erhunmwunse; Izekor, Patience Emiolo; Eghafona, Nosakhare Odeh; Enabulele, Onaiwu Idahosa; Ophori, Endurance

**Source:** North American journal of medical sciences; Jun 2010; vol. 2 (no. 6); p. 263-266

**Publication Date:** Jun 2010

**Publication Type(s):** Journal Article

**PubMedID:** 22574301

Available at [North American Journal of Medical Sciences](https://www.ncbi.nlm.nih.gov/pubmed?term=22574301) - from Europe PubMed Central - Open Access

**Abstract:**

**BACKGROUND:** Asymptomatic bacteriuria is the significant presence of bacteria in the urine of an individual without symptoms. In pregnancy, the apparent reduction in immunity of pregnant women tends to encourage the growth of pathogens.

**AIM:** This study was carried out to determine the prevalence of asymptomatic bacteriuria in pregnant women attending a primary health centre in Benin City, Nigeria.

**MATERIALS AND METHODS:** A total of 1,228 pregnant women were recruited for this study. All subjects were clinically identified to have no signs and symptoms of UTI. Clean catch midstream urine sample was collected from each patient into sterile universal container. The urine samples were examined microscopically and by cultural method. Identification of isolates was by standard microbiological technique.

**RESULT:** A total of 556 (45.3%) were positive for significant bacteriuria. There was a significant difference in the prevalence of asymptomatic bacteriuria with respect to age (P < 0.0001). Trimester did not show any significant difference (P = 0.2006) in the prevalence of asymptomatic bacteriuria. Escherichia coli was the most predominant organism followed closely by Staphylococcus aureus. Ciprofloxacin, Ceftriaxone and Augmentin were found to be the most effective antibiotics against the urinary isolates.

**CONCLUSION:** Asymptomatic bacteriuria is not uncommon among antenatal patients in the population studied. Routine urine cultural test should be carried out on all antenatal patients in order to identify any unsuspecting infection. This measure will go a long way in reducing maternal and obstetric complications associated with pregnancy.

**Database:** Medline
26. Screening and treating asymptomatic bacteriuria in pregnancy
Author(s): Lumbiganon P.; Thinkhamrop J.; Laopaiboon M.
Source: Current Opinion in Obstetrics and Gynecology; Apr 2010; vol. 22 (no. 2); p. 95-99
Publication Date: Apr 2010
Publication Type(s): Review
PubMedID: 20139763
Available at Current opinion in obstetrics & gynecology - from Ovid (Journals @ Ovid) - Remote Access
Abstract:Purpose of Review: Asymptomatic bacteriuria (ASB) in pregnancy, if left undiagnosed and appropriately treated can lead to acute pyelonephritis in mothers and low birth weight in infants. Urine culture is the gold standard for diagnosing ASB. Unfortunately, urine culture is limitedly available. The present Review aims at evaluating performance of various screening tests and effectiveness of antibiotic regimens for ASB. Recent Findings: Positive dipslide test is very likely to have a definitive diagnosis of ASB, whereas a negative result effectively rules out ASB. Available evidences regarding the performance of urine dipstick are still conflicting, it is currently not appropriate to recommend urine dipstick for screening ASB in pregnancy. Choice of antibiotics should be guided by antimicrobial susceptibility testing whenever possible. Nitrofurantoin seems to be antibiotic of choice for ASB in pregnancy. Seven-day regimen of antibiotics gives a better microbiological cure rate but no difference in important clinical outcomes compared with 1-day regimen. Summary: Dipslide culture is a promising screening test for ASB. Pregnant women with ASB should be treated with 7-day regimen of antibiotics, although 1-day regimen might be appropriate in some settings. More research is needed for identifying appropriate screening tests for ASB. © 2010 Wolters Kluwer Health Lippincott Williams & Wilkins.
Database: EMBASE

27. Evaluation of the diagnostic value of pyuria and bacteriuria in bacteriuria asymptomatic in pregnant women
Author(s): Kashanian M.; Dadkhah F.
Source: International Urogynecology Journal and Pelvic Floor Dysfunction; Sep 2009; vol. 20 (no. 3)
Publication Date: Sep 2009
Publication Type(s): Conference Abstract
Available at International urogynecology journal and pelvic floor dysfunction - from SpringerLink
Available at International urogynecology journal and pelvic floor dysfunction - from ProQuest (Hospital Premium Collection) - NHS Version
Abstract:Objective: Evaluation of the diagnostic value of pyuria and bacteriuria in asymptomatic bacteriuria in pregnant women. Methods: A cross sectional study was performed on 1246 pregnant women who were visited in a prenatal clinic without any urinary symptoms. For all of these women urinalysis (leukocyte count, bacteriuria) and urine culture were done. Then the patients were divided into the three groups: 1) the patients who had just pyuria in their urinalysis (>=5 WBC in HPF), 2)The patients who had just bacteriuria in their urinalysis, 3)The patients who had both bacteriuria and pyuria. The positive urine culture was considered as gold standard. Positive urine culture was defined as growth of more than 105 of one kind of bacteria. Then the sensitivity, specificity, positive predictive value (PPV) and negative predictive value(NPV), were determined for these three groups. Results: There were 113 (9%) cases of positive culture and 222 cases of pyuria, bacteriuria or both. In patients with pyuria (78 cases), there were 34 (43.5%) cases of positive culture. With a sensitivity of 86.9%, Specificity of 94.5%, PPV=57.7% and NPV=99.3%. In Patients with bacteriuria (73 cases), there
were 27 cases of positive culture, with the sensitivity of 91.8%, specificity of 99.3%, PPV=54.8% and NPV=99.3%. In the third group (pyuria plus bacteriuria), (71 cases), 52 (73.2%) patients had positive culture. The sensitivity, specificity, PPV and NPV of test were 88.1%, 98.3%, 73.2% and 99.3% respectively. There were 7 cases (0.5%) of positive culture without pyuria and bacteriuria. Conclusion: The combination of pyuria and bacteriuria in urinalysis or pyuria with more than 10 WBC in HPF or many bacteriuria, have high sensitivity, specificity, NPV and PPV for the diagnosis of asymptomatic bacteriuria and can be a good substitute for urine culture and only 7.7% of patients need to urine culture.

Database: EMBASE

28. Asymptomatic bacteriuria: Is the presence of microscopic bacteriuria without pyuria in asymptomatic pregnant females associated with positive urine culture? A retrospective cross-sectional study

Author(s): Hile D.; Cashin B.; Crouch R.; Strode C.

Source: Annals of Emergency Medicine; Sep 2009; vol. 54 (no. 3)

Publication Date: Sep 2009

Publication Type(s): Conference Abstract

Abstract: Study Objectives: Urine samples are frequently collected from pregnant females in the acute care setting during triage, or as part of initial workup, regardless of the presence of symptoms consistent with urinary tract infection. Asymptomatic culture-proven bacteriuria in pregnant females is typically treated with antibiotics due to concern for risks to the pregnancy and the development of pyelonephritis. In the acute care setting, it is common practice to treat patients with abnormal urinalysis results, as patient follow-up for culture results may be problematic. While the sensitivity and specificity of the various components of microscopic urinalysis have been well described, there is a paucity of literature comparing culture results of abnormal urinalyses to normal urinalyses in asymptomatic pregnant females. Our objective was to determine if there is a significant difference in positive culture results in pregnant patients whose urinalysis is positive only for microscopic bacteria, as compared to those with normal urinalysis. Methods: A retrospective cross-sectional study was performed on pregnant females who presented as outpatients to a military treatment facility (MTF), and had both a urinalysis and urine culture performed. Pregnant females aged 18-50 were included who denied symptoms of urinary tract infection. Exclusion criteria included symptoms of urinary tract infection, urinalysis positive for markers other than bacteria, or incomplete information regarding symptoms, urinalysis or culture results. The study variables included positive or negative microscopic bacteria on urinalysis, and positive or negative urine culture. The data was summarized by comparing proportions with 95% confidence interval for positive culture results in both groups. Results: All pregnant females who presented to an MTF in 2008- February 2009, and had a urinalysis and urine culture performed, were identified via computer data extraction. A total of 3547 charts were reviewed. 2552 charts were excluded due to incomplete data or exclusion criteria. 995 patients were included; 473 with urinalysis abnormal only for presence of bacteria, and 522 with normal urinalysis. Nine patients with bacteria noted on urinalysis had positive urine cultures; 1.9% (95% confidence interval, .95% to 3.6%). Twelve patients with normal urinalysis had positive urine cultures, 2.2% (95 % confidence interval, 1.3% to 4.0%). Conclusion: There was no significant difference between proportions of positive culture results in the groups evaluated in our study. In this study population, pregnant patients without symptoms of urinary tract infection whose urinalysis is positive only for bacteria do not have a significantly greater incidence of bacteriuria as defined by culture results, compared to those with completely negative urinalyses. It may be reasonable to withhold antibiotics from asymptomatic pregnant females whose microscopic urinalysis demonstrates presence of bacteria without other indicators of infection.
29. Accuracy of diagnostic tests to detect asymptomatic bacteriuria during pregnancy.

**Author(s):** Mignini, Luciano; Carroli, Guillermo; Abalos, Edgardo; Widmer, Mariana; Amigot, Susana; Nardin, Juan Manuel; Giordano, Daniel; Merialdi, Mario; Arciero, Graciela; Del Carmen Hourquescos, Maria; World Health Organization Asymptomatic Bacteriuria Trial Group

**Source:** Obstetrics and gynecology; Feb 2009; vol. 113 (no. 2); p. 346-352

**Publication Date:** Feb 2009

**Publication Type(s):** Research Support, Non-u.s. Gov't Randomized Controlled Trial Multicenter Study Journal Article

**PubMedID:** 19155905

Available at [Obstetrics and gynecology](https://www.obstetricsandgynecology.com) - from Free Medical Journals . com

Available at [Obstetrics and gynecology](https://www.obstetricsandgynecology.com) - from Ovid (LWW Total Access Collection 2015 - Q1 with

**Abstract:** OBJECTIVE A dipslide is a plastic paddle coated with agar that is attached to a sterile plastic vial. Our objective was to estimate the diagnostic accuracy of the dipslide culture technique to detect asymptomatic bacteriuria during pregnancy and to evaluate the accuracy of nitrate and leucocyte esterase dipslides for screening.

METHODS This was an ancillary study within a trial comparing single-day with 7-day therapy in treating asymptomatic bacteriuria. Clean-catch midstream samples were collected from pregnant women seeking routine care. Positive and negative likelihood ratios and sensitivity and specificity for the culture-based dipslide to detect and chemical dipsticks (nitrites, leukocyte esterase, or both) to screen were estimated using traditional urine culture as the "gold standard." RESULTS: A total of 3,048 eligible pregnant women were screened. The prevalence of asymptomatic bacteriuria was 15%, with Escherichia coli the most prevalent organism. The likelihood ratio for detecting asymptomatic bacteriuria with a positive dipslide test was 225 (95% confidence interval [CI] 113-449), increasing the probability of asymptomatic bacteriuria to 98%; the likelihood ratio for a negative dipslide test was 0.02 (95% CI 0.01-0.05), reducing the probability of bacteriuria to less than 1%. The positive likelihood ratio of leukocyte esterase and nitrite dipsticks (when both or either one was positive) was 6.95 (95% CI 5.80-8.33), increasing the probability of bacteriuria to only 54%; the negative likelihood ratio was 0.50 (95% CI 0.45-0.57), reducing the probability to 8%. CONCLUSION A pregnant woman with a positive dipslide test is very likely to have a definitive diagnosis of asymptomatic bacteriuria, whereas a negative result effectively rules out the presence of bacteriuria. Dipsticks that measure nitrites and leukocyte esterase have low sensitivity for use in screening for asymptomatic bacteriuria during gestation.

**Clinical Trial Registration:** ISRCTN, isrctn.org, 1196608LEVEL OF EVIDENCEII.

**Database:** Medline
30. Evaluation of various screening tests to detect asymptomatic bacteriuria in pregnant women.

**Author(s):** Jayalakshmi, J; Jayaram, V S

**Source:** Indian journal of pathology & microbiology; 2008; vol. 51 (no. 3); p. 379-381

**Publication Date:** 2008

**Publication Type(s):** Research Support, Non-u.s. Gov't Journal Article Evaluation Studies

**PubMedID:** 18723963

Available at [Indian journal of pathology & microbiology](https://ijpmonline.org) - from ijpmonline.org

**Abstract:** To evaluate the diagnostic efficacy of various screening tests in detecting asymptomatic bacteriuria among pregnant women. Clean catch midstream urine specimens were collected from 630 consecutive pregnant women and processed. Forty-four (7.4%) of the urine samples were culture positive, with Escherichia coli as the predominant organism isolated (57.4%). The results of the four screening tests, viz., Gram's staining of uncentrifuged urine, pus cell count, nitrite test and leukocyte esterase (LE) test, were compared against urine culture. Gram's stain of the uncentrifuged urine was found to be the single most useful test with a sensitivity and negative predictive value (NPV) of 85.1% and 98.8%, respectively. Pus cell count was the least sensitive. Neither the nitrite test nor the LE test alone was sensitive enough with 74.4% and 61.7%, respectively. However, when either or both tests positive were considered, it increased the sensitivity and NPV comparable with Gram's staining results, with 82.9% and 98.8%, respectively. With the potential to be used as an office diagnostic procedure, the combined nitrite and LE dipstick test may provide an acceptable alternative.

**Database:** Medline

31. Comparing the specificity and sensitivity of nitrate and leucocyte tests on multistick in screening for urinary tract infections amongst pregnant women at Lagos State University Teaching Hospital Ikeja, Nigeria.

**Author(s):** Onakoya, J A A; Amole, O O; Ogunsanya, O O; Tayo, O

**Source:** Nigerian quarterly journal of hospital medicine; 2008; vol. 18 (no. 2); p. 61-63

**Publication Date:** 2008

**Publication Type(s):** Comparative Study Journal Article

**PubMedID:** 19068553

**Abstract:** OBJECTIVE: This study was carried out to determine a very reliable and rapid screening test using multistick (or multistix), microscopy, and culture methods for urinary tract infections (UTI) in pregnant women attending the antenatal booking clinic (ANC) of the Department of Obstetrics and Gynaecology of Lagos State University Teaching Hospital, Ikeja, Nigeria. PATIENTS AND METHODSA group of 352 pregnant women were randomly selected at the antenatal booking clinic and evaluated for urinary tract infections (UTI) using the above mentioned screening test methods. The ages of patients ranged from 20 to 40 years, with the 31-35 age range accounting for over 42% of the study population, and two-thirds of them being multigravidae. RESULTS: Positive urine culture with significant bacteriuria was found in 163 patients which was 46.3%. One hundred and thirty three (133) of this number did not present with urinary symptoms at all, although pair urine culture was positive with significant bacteriuria. Also, eleven patients of the study population has urinary symptoms but their urine culture did not yield any significant growth, after 48 hours of incubation. CONCLUSION: It was found in this study that leucocyte dipstick test has excellent specificity (90.5%) but not a very good sensitivity (28.8%), when compared with nitrite dipstick which has a specificity of 78.8% and sensitivity of 56.4%.
Asymptomatic bacteriuria and pyuria in pregnancy

Author(s): Rahimkhani M.; Sharifian R.; Khavari-Daneshvar H.

Source: Acta Medica Iranica; 2008; vol. 46 (no. 5); p. 409-412

Publication Date: 2008

Publication Type(s): Article

Available at Acta Medica Iranica - from tums.ac.ir

Abstract: Pregnant women are at increased risk for urinary tract infection (UTI) but in many cases infection is asymptomatic. This study was performed to determine the incidence of asymptomatic bacteriuria and pyuria in pregnant women. A total of 86 pregnant women during first trimester and 56 nonpregnant women were evaluated. All subjects were clinically identified to have no signs and symptoms of UTI. Clean catch midstream urine samples were collected for both groups. Urine samples were examined microscopically and were cultured. Bacteriological examination revealed asymptomatic bacteriuria in 25 (29.1%) and 3 (5.4%) of the study group and controls, respectively (P < 0.05). Microscopic analysis of urine revealed pyuria in 18 (20.9%) and 3 (5.4%) of the study group and controls, respectively (P < 0.05). In study group, Escherichia coli were found in 20%, Staphylococcus epidermidis in 36%, Staphylococcus haemolyticus in 12%, streptococcus group D in 12%, Staphylococcus saprophyticus in 12% and Proteus mirabilis in 8%. In control group, E. coli were found in 33.3% and S. epidermidis in 66.7%. Our results show that the incidence of asymptomatic bacteriuria is significantly higher in pregnant women than nonpregnant women. The main finding in the present study was that 29.1% of the pregnant women who were in first trimester had asymptomatic bacteriuria which is much higher than figures reported from other countries. The use of microscopic urinanalysis was not an effective method of detecting asymptomatic bacteriuria and urine culture is necessary for screening these pregnant women. © 2008 Tehran University of Medical Sciences.
33. Reagent strip testing for antenatal screening and first meaningful of asymptomatic bacteriuria in pregnant women.

**Author(s):** Kovavisarach, Ekchai; Vichaipruck, Maytina; Kanjanahareutai, Suwattana

**Source:** Journal of the Medical Association of Thailand = Chotmaihet thangphaet; Dec 2008; vol. 91 (no. 12); p. 1786-1790

**Publication Date:** Dec 2008

**Publication Type(s):** Research Support, Non-u.s. Gov't Journal Article

**PubMedID:** 19133509

**Abstract:**

OBJECTIVE To evaluate the diagnostic performance of reagent strip test as a screening test for asymptomatic bacteriuria (ABU) in pregnant women.

MATERIAL AND METHOD Three hundred and sixty asymptomatic pregnant women who attended their first antenatal appointment at Rajavithi Hospital from August 1st to October 31st, 2005 were enrolled. Those with symptoms of urinary tract infection within one month, those who had been prescribed antibiotics during the previous 7 days, and those with medical or obstetric complications, vaginal bleeding and a history of urinary tract diseases were excluded. Urine specimens were collected by clean-catched midstream urine technique for urine dipstick and culture.

RESULT The prevalence of ABU was 10.0%. The urine dipstick nitrite leukocyte esterase and combined test had a sensitivity of 16.7%, 75.0% and 16.7%, specificity of 99.1%, 67.9% and 99.4%, positive predictive value of 66.7%, 20.6% and 75.0%, negative predictive value of 91.5, 96.1% and 91.5%, and accuracy of 90.8%, 68.6% and 91.1%, respectively.

CONCLUSION Reagent strip testing indicated a fair sensitivity for routine antenatal screening for asymptomatic bacteriuria in pregnant women.

**Database:** Medline
The diagnostic accuracy of the rapid dipstick test to predict asymptomatic urinary tract infection of pregnancy

Author(s): Eigbefoh J.O.; Isabu P.; Abebe J.; Okpere E.

Source: Journal of Obstetrics and Gynaecology; Jul 2008; vol. 28 (no. 5); p. 490-495

Publication Date: Jul 2008

Publication Type(s): Article

PubMedID: 18850421

Abstract: Untreated urinary tract infection can have devastating maternal and neonatal effects. Thus, routine screening for bacteriuria is advocated. This study was designed to evaluate the diagnostic accuracy of the rapid dipstick test to predict urinary tract infection in pregnancy with the gold standard of urine microscopy, culture and sensitivity acting as the control. The urine dipstick test uses the leucocyte esterase, nitrite and test for protein singly and in combination. The result of the dipstick was compared with the gold standard, urine microscopy, culture and sensitivity using confidence interval for proportions. The reliability and validity of the urine dipstick was also evaluated. Overall, the urine dipstick test has a poor correlation with urine culture ($p = 0.125, CI 95\%$). The same holds true for individual components of the dipstick test. The overall sensitivity of the urine dipstick test was poor at 2.3%. Individual sensitivity of the various components varied between 9.1% for leucocyte esterase and the nitrite test to 56.8% for leucocyte esterase alone. The other components of the dipstick test, the test of nitrite, test for protein and combination of the test (leucocyte esterase, nitrite and proteinuria) appear to decrease the sensitivity of the leucocyte esterase test alone. The ability of the urine dipstick test to correctly rule out urinary tract infection (specificity) was high. The positive predictive value for the dipstick test was high, with the leucocyte esterase test having the highest positive predictive value compared with the other components of the dipstick test. The negative predictive value (NPV) was expectedly highest for the leucocyte esterase test alone with values higher than the other components of the urine dipstick test singly and in various combinations. Compared with the other parameters of the urine dipstick test, singly and in combination, leucocyte esterase appears to be the most accurate (90.25%). The dipstick test has a limited use in screening for asymptomatic bacteriuria. The leucocyte esterase test component of the dipstick test appears to have the highest reliability and validity. The other parameters of the dipstick test decreases the reliability and validity of the leucocyte esterase test. A positive test merits empirical antibiotics, while a negative test is an indication for urine culture. The urine dipstick test if positive will also be useful in follow-up of patient after treatment of urinary tract infection. This is useful in poor resource setting especially in the third world where there is a dearth of trained personnel and equipment for urine culture. © 2008 Informa UK Ltd.

Database: EMBASE
35. Screening for asymptomatic bacteriuria in adults: U.S. Preventive Services Task Force reaffirmation recommendation statement

Author(s): anonymous

Source: Annals of Internal Medicine; Jul 2008; vol. 149 (no. 1); p. 43-19

Publication Date: Jul 2008

Publication Type(s): Article

PubMedID: 18591636

Available at Annals of internal medicine - from Patricia Bowen Library & Knowledge Service West Middlesex University Hospital NHS Trust (lib302631) Local Print Collection

Abstract: Description: Reaffirmation of the 2004 U.S. Preventive Services Task Force recommendation statement about screening for asymptomatic bacteriuria in adults. Methods: The U.S. Preventive Services Task Force did a targeted literature search for evidence on the benefits and harms of screening for asymptomatic bacteriuria in pregnant women, nonpregnant women, and men. Recommendations: Screen for asymptomatic bacteriuria with urine culture in pregnant women at 12 to 16 weeks' gestation or at the first prenatal visit, if later. (Grade A recommendation.) Do not screen for asymptomatic bacteriuria in men and nonpregnant women. (Grade D recommendation.).

Database: EMBASE

36. Asymptomatic bacteriuria in pregnancy: Can automated urinanalysis be helpful for detection?

Author(s): Karabulut A.

Source: Journal of the Turkish German Gynecology Association; Dec 2007; vol. 8 (no. 4); p. 367-371

Publication Date: Dec 2007

Publication Type(s): Article

Abstract: Objective: To assess whether or not automated urinanalysis is helpful for detection of asymptomatic bacteriuria and urinary tract infections in pregnant patients. Accuracy is evaluated by using urine culture as a gold standard. Materials and Methods: Midstream first void urine samples obtained from 102 pregnant women were tested using automated urinanalysis to detect nitrite, total bacteria and leukocyte counts. Urine cultures were performed using blood agar and eosin methylene blue agar, and more than 100,000 colony forming units per ml indicated urinary tract infection or asymptomatic bacteriuria. Each result was compared with urine culture. Validity of the automated urinanalysis was investigated, using sensitivity, specificity, positive and negative predictive values for each parameter and in combination. Results: Nitrite positivity was found to be the most accurate (96%) variable for detection of UTI and AB, and showed excellent correlation with the urine culture (r=0.8, p<0.001). The combined use of three parameters reduced the sensitivity (33%) but increased specificity (100%), accuracy (92%) rates and positive and negative predictive values (100% and 92%, respectively). Total visible cost was Currency sign211.14 for automated urine analysis and Currency sign48.38 for urine culture for the 102 patients. However, when the cost of under/over treatment according to results of automated urine analysis is taken into account, its cost exceeds that of urine culture. Discussion: Based on its high specificity and positive predictive value, patients with positive nitrite in automated urine analysis can be treated empirically until results of urine culture obtained. However, negative results for nitrite do not exclude asymptomatic bacteriuria and urinary tract infections, and urine culture is still needed for definite diagnosis. Although, it provides useful information, a routine use of automated urinanalysis for screening of bacteriuria proved neither valid nor cost-effective in pregnant patients.

Database: EMBASE
37. Prevalence and implications of isolated microscopic hematuria in asymptomatic Chinese pregnant women

**Author(s):** Szeto C.-C.; To K.-F.; Chow K.-M.; Chung K.-Y.; Leung C.-B.; Lui S.-F.; Li P.K.-T.; Lai F.M.-M.; Tam W.-H.; Lau T.-K.

**Source:** Nephron - Clinical Practice; Mar 2007; vol. 105 (no. 4)

**Publication Date:** Mar 2007

**Publication Type(s):** Article

**PubMedID:** 17259739

**Abstract:** Background: IgA nephropathy (IgAN) is the most common primary glomerulonephritis worldwide. However, the actual prevalence of microscopic hematuria and IgAN is unknown in the Chinese population. Methods: We screened 7,828 consecutive pregnant women for microscopic hematuria in the antenatal clinic of a tertiary referral center. Persistent microscopic hematuria was defined as urine Hemastix (Bayer Diagnostics, Hong Kong) of 1+ for red cells in two clinic visits. Subjects were referred to the renal clinic for specialist evaluation, including measurement of blood pressure, serum creatinine, urine bacterial culture, and quantification of proteinuria. Result: There were 207 women (2.64%) with microscopic hematuria. Mean age was 31.8 +/- 5.0 years. In 101 patients (48.8%), there was proteinuria >0.1 g/day by quantitative assay. Hematuria was found to resolve before or shortly after delivery in 126 (60.9%) and 68 women (32.9%), respectively. Five patients (2.4%) had urinary tract infection proved by repeated urine culture, 1 had papillary necrosis, and 1 had duplex collecting system. Three patients were confirmed to have IgAN by renal biopsy; all had normal blood pressure and serum creatinine, but dysmorphic red cells in urine microscopy, and proteinuria of over 0.5 g/day that persisted after delivery. Renal biopsy on another woman showed no specific pathology. Two women were lost to follow-up, both with normal renal function and no detectable proteinuria. The overall prevalence of IgAN was 38 cases per 100,000 population (95% confidence interval: 8-112 cases). Conclusion: Microscopic hematuria is not uncommon in pregnant women, and IgAN is present in a small proportion of these patients. Further study is needed to determine whether screening for microscopic hematuria would allow early diagnosis and improve the prognosis of these patients. Copyright © 2007 S. Karger AG.

**Database:** EMBASE
38. Evaluation of rapid urine screening tests to detect asymptomatic bacteriuria in pregnancy.

**Author(s):** Kacmaz, Birgul; Cakir, Ozenc; Aksoy, Altan; Biri, Aydan

**Source:** Japanese journal of infectious diseases; Aug 2006; vol. 59 (no. 4); p. 261-263

**Publication Date:** Aug 2006

**Publication Type(s):** Journal Article

**PubMedID:** 16936347

**Abstract:** In order to compare the performance of leukocyte esterase and nitrite urine dipstick tests with enhanced urinalysis (uncentrifuged urine white blood cell count/mm(3) plus Gram stain) in detecting asymptomatic bacteriuria in obstetric patients, clean-catch midstream urine specimens were collected from 250 consecutive asymptomatic pregnant women. Ten of the women (4.0%) showed urine culture results indicating significant bacteriuria. The nitrite test was the most specific (99.2%) of these tests, however, its sensitivity was found to be the lowest (60.0%). The sensitivity of the leukocyte esterase test was 70.0%, on the other hand, while its positive predictive value was 28.0%. The sensitivity and specificity of enhanced urinalysis were found to be 50.0 and 96.7%, respectively. None of the rapid tests was found to be a reliable alternative for culture screening of all pregnant women. Nitrite tests are useful screening tests for detecting asymptomatic bacteriuria only if their limitations are fully understood, while leukocyte esterase and enhanced urinalysis tests are not suitable for screening for asymptomatic bacteriuria. Our findings support previous conclusions that quantitative urine cultures are required to rule out asymptomatic bacteriuria in pregnant women.

**Database:** Medline

39. Screening for asymptomatic bacteriuria in pregnancy.

**Author(s):** McIsaac, Warren; Carroll, June C; Biringer, Anne; Bernstein, Paul; Lyons, Elliott; Low, Donald E; Permaul, Joanne A

**Source:** Journal of obstetrics and gynaecology Canada : JOGC = Journal d'obstetrique et gynecologie du Canada : JOGC; Jan 2005; vol. 27 (no. 1); p. 20-24

**Publication Date:** Jan 2005

**Publication Type(s):** Research Support, Non-u.s. Gov't Journal Article

**PubMedID:** 15937578

**Abstract:** OBJECTIVE To compare the following 4 screening strategies for detecting asymptomatic bacteriuria (ABU) in pregnancy: urine testing with leukocyte-esterase-nitrite (LEN) strips at each prenatal visit followed by a urine culture if positive; a single urine culture at fewer than 20 weeks' gestation; 2 urine cultures, at fewer than 20 weeks' gestation and at 28 weeks' gestation; or 3 urine cultures, at fewer than 20 weeks', at 28 weeks', and at 36 weeks' gestation. METHODS Participants were pregnant women presenting to 2 obstetricians and 6 family physicians at outpatient family medicine and obstetrical clinics in a large Canadian urban teaching hospital. LEN dipstick urine testing was conducted at each prenatal visit. A midstream urine culture was obtained from all women before 20 weeks' gestation and at 28 weeks' and 36 weeks' gestation, as well as for positive LEN tests. Any positive urine culture in an asymptomatic woman was designated a case of ABU. The total number of ABU cases that would be detected by each of the 4 strategies (LEN dipstick testing only, a single urine culture, 2 cultures, and 3 cultures) was determined and compared. RESULTS There were 49 cases of ABU among 1050 women (4.7%). LEN testing at each prenatal visit identified 7 cases (14.3%), compared with 20 cases (40.8%) with 1 urine culture, 31 (63.3%) with 2 urine cultures, and 43 (87.8%) with 3 urine cultures. CONCLUSION A single urine culture before 20 weeks' gestation missed more than one-half the ABU cases. A culture in each trimester identified most ABU cases.

**Database:** Medline
40. Infectious Diseases Society of America guidelines for the diagnosis and treatment of asymptomatic bacteriuria in adults.

**Author(s):** Nicolle, Lindsay E; Bradley, Suzanne; Colgan, Richard; Rice, James C; Schaeffer, Anthony; Hooton, Thomas M; Infectious Diseases Society of America; American Society of Nephrology; American Geriatric Society

**Source:** Clinical infectious diseases : an official publication of the Infectious Diseases Society of America; Mar 2005; vol. 40 (no. 5); p. 643-654

**Publication Date:** Mar 2005

**Publication Type(s):** Practice Guideline Journal Article

**PubMedID:** 15714408

Available at Clinical infectious diseases : an official publication of the Infectious Diseases Society of America - from Oxford Journals - Medicine

**Database:** Medline

41. The urine dipstick test useful to rule out infections. A meta-analysis of the accuracy.

**Author(s):** DeVillé, Walter L J M; Yzermans, Joris C; van Duijn, Nico P; Bezemer, P Dick; van der Windt, Daniëlle A W M; Bouter, Lex M

**Source:** BMC urology; Jun 2004; vol. 4; p. 4

**Publication Date:** Jun 2004

**Publication Type(s):** Meta-analysis Journal Article Validation Studies Review

**PubMedID:** 15175113

Available at BMC Urology - from BioMed Central

**Abstract:**BACKGROUND Many studies have evaluated the accuracy of dipstick tests as rapid detectors of bacteriuria and urinary tract infections (UTI). The lack of an adequate explanation for the heterogeneity of the dipstick accuracy stimulates an ongoing debate. The objective of the present meta-analysis was to summarise the available evidence on the diagnostic accuracy of the urine dipstick test, taking into account various pre-defined potential sources of heterogeneity. METHODS Literature from 1990 through 1999 was searched in Medline and Embase, and by reference tracking. Selected publications should be concerned with the diagnosis of bacteriuria or urinary tract infections, investigate the use of dipstick tests for nitrites and/or leukocyte esterase, and present empirical data. A checklist was used to assess methodological quality. RESULTS 70 publications were included. Accuracy of nitrites was high in pregnant women (Diagnostic Odds Ratio = 165) and elderly people (DOR = 108). Positive predictive values were >/=80% in elderly and in family medicine. Accuracy of leukocyte-esterase was high in studies in urology patients (DOR = 276). Sensitivities were highest in family medicine (86%). Negative predictive values were high in both tests in all patient groups and settings, except for in family medicine. The combination of both test results showed an important increase in sensitivity. Accuracy was high in studies in urology patients (DOR = 52), in children (DOR = 46), and if clinical information was present (DOR = 28). Sensitivity was highest in studies carried out in family medicine (90%). Predictive values of combinations of positive test results were low in all other situations. CONCLUSION Overall, this review demonstrates that the urine dipstick test alone seems to be useful in all populations to exclude the presence of infection if the results of both nitrites and leukocyte-esterase are negative. Sensitivities of the combination of both tests vary between 68 and 88% in different patient groups, but positive test results have to be confirmed. Although the
combination of positive test results is very sensitive in family practice, the usefulness of the dipstick test alone to rule in infection remains doubtful, even with high pre-test probabilities.

Database: Medline

42. Urinary tract infection during pregnancy--dipstick urinalysis vs. culture and sensitivity.

**Author(s):** D'Souza, Zoë; D'Souza, D

**Source:** Journal of obstetrics and gynaecology : the journal of the Institute of Obstetrics and Gynaecology; Jan 2004; vol. 24 (no. 1); p. 22-24

**Publication Date:** Jan 2004

**Publication Type(s):** Comparative Study Journal Article

**PubMedID:** 14675975

**Abstract:** Although it is important not to ignore clinical symptoms suggestive of a urinary tract infection (UTI), especially in antenatal patients, samples which have no abnormalities detected on bedside urinalysis may not need to be sent to the laboratory for culture and sensitivity (C&S) testing. If leucocytes, blood and/or protein are found in the samples, then they may need to be sent to the laboratory for further assessment, but no treatment needs to be instigated before obtaining the culture and sensitivity result, unless indicated clinically. The presence of nitrites in the sample is, however, much more suggestive of a bacterial infection and samples must be sent to the laboratory. In these cases, treatment with antibiotics prior to results may be warranted. Of the 100 samples tested in this study, only two had positive cultures for bacterial infection (Escherichia coli) and these were the only samples which had been strongly positive for nitrites using the Nephrur6Labsticks. These bedside screening tests may be a useful and cost-effective way of reducing the numbers of mid-stream urine samples sent to the laboratory for further testing.

Database: Medline

43. The clinical utility of routine urinalysis in pregnancy: a prospective study.

**Author(s):** Murray, Noreen; Homer, Caroline S E; Davis, Gregory K; Curtis, Julie; Mangos, George; Brown, Mark A

**Source:** The Medical journal of Australia; Nov 2002; vol. 177 (no. 9); p. 477-480

**Publication Date:** Nov 2002

**Publication Type(s):** Research Support, Non-u.s. Gov't Journal Article

**PubMedID:** 12405888

**Abstract:** OBJECTIVE To determine whether routine urinalysis in the antenatal period facilitates diagnosis of pre-eclampsia. Can routine urinalysis during pregnancy be discontinued in women with normal results of dipstick urinalysis and microscopy at the first antenatal visit? DESIGN Prospective observational study. SETTING A metropolitan public hospital and a private hospital in Sydney (NSW). PARTICIPANTS One thousand women were enrolled at their first antenatal visit (March to November 1999), and 913 completed the study. OUTCOME MEASURES The primary outcome was a diagnosis of de novo hypertension (gestational hypertension, pre-eclampsia, or pre-eclampsia superimposed on chronic hypertension). RESULTS Thirty-five women had dipstick proteinuria at their first antenatal visit. In 25 (71%) of these women, further dipstick proteinuria was detected during pregnancy, and two (6%) were diagnosed with pre-eclampsia. Of the 867 without dipstick proteinuria at the first visit, 338 (39%) had dipstick proteinuria (> 1+) at some time during pregnancy. There were no statistically significant differences in the proportion of women with and without dipstick proteinuria at their first visit who developed hypertension during pregnancy. Only six women developed proteinuria before the onset of hypertension. Women who had an abnormal
result of a midstream urine test at their first visit, compared with women with a normal result, were more likely to have a urinary tract infection diagnosed during pregnancy; however, the numbers were small.

**CONCLUSION** In the absence of hypertension, routine urinalysis during pregnancy is a poor predictor of pre-eclampsia. Therefore, after an initial screening urinalysis, routine urinalysis could be eliminated from antenatal care without adverse outcomes for women.

**Database**: Medline

44. Laboratory aspects of asymptomatic bacteriuria in pregnancy.

**Author(s)**: Mohammad, Marlyn; Mahdy, Zaleha A; Omar, Jamil; Maan, Noorashikin; Jamil, M A

**Source**: The Southeast Asian journal of tropical medicine and public health; Sep 2002; vol. 33 (no. 3); p. 575-580

**Publication Date**: Sep 2002

**Publication Type(s)**: Research Support, Non-u.s. Gov't Randomized Controlled Trial Clinical Trial Journal Article

**PubMedID**: 12693594

**Abstract**: A total of 1,661 pregnant women aged between 13 and 45 years were screened for bacteriuria by urine culture. Of the 1,661 culture results, 615 (37%) yielded no growth; 728 (43.8%) yielded no significant growth (presence of 10(5) organisms/ml urine of more than one type of bacteria) and only 32 (1.9%) showed significant growth (presence of >10(5) organisms/ml urine of a single bacterium). Urine microscopy was also conducted. Two hundred and twenty-four (13.5%) specimens had >10 white blood cells/ml urine, of which 66 had >100 white blood cells; 13 were from the significant growth group. Three hundred and seventy-four (22.5%) specimens showed the presence of bacteria, 42 (2.5%) had red blood cells, 370 (22.3%) had epithelial cells, 58 (3.5%) had crystals, and 14 (0.8%) had yeasts. The most common bacterium isolated was Escherichia coli (12; 40%); the others included group B Streptococcus (5; 15%), Klebsiella spp (5; 15%), Diphtheroids (2), and Candida albicans (2). Fifty-two percent of tested strains were sensitive to ampicillin; 24 of 28 strains (85.7%) were sensitive to ciprofloxacin; all 7 strains tested were sensitive to nitrofurantoin and all 20 strains tested were sensitive to cotrimoxazole; 14/20 (70%) and 16/17 (94.1%) were sensitive to cephalexin and cefuroxime respectively. This study shows that asymptomatic bacteriuria does occur in pregnant women, albeit at a very low rate in an urban setting like Cheras. Urine microscopy is not specific and only serves as a guide to bacteriuria. The commonest causative organisms are those from the gastrointestinal tract and vagina. The antibiogram showed that cefuroxime and cephalexin are likely to be effective in treating bacteriuria: ampicillin must be reserved for Gram-negative organisms. For Gram-positive organisms, of which Group B Streptococcus is important, ampicillin is still effective in vitro. Nitrofurantion and cotrimoxazole have excellent activity in vitro and should be considered for therapy. 17.2% of the urine culture yielded mixed growth: likely to indicate that contamination of urine specimens still happens despite the strict instructions given to patients about the collection of a midstream urine specimen. Proper collection, appropriate transport, and the early processing of urine specimens remain essential.

**Database**: Medline
45. Reagent strip testing is not sensitive for the screening of asymptomatic bacteriuria in pregnant women.

**Author(s):** Lumbiganon, Pisake; Chongsomchai, Chompilas; Chumworathayee, Bundit; Thinkhamrop, Jadsada

**Source:** Journal of the Medical Association of Thailand = Chotmaihet thangphaet; Aug 2002; vol. 85 (no. 8); p. 922-927

**Publication Date:** Aug 2002

**Publication Type(s):** Research Support, Non-u.s. Gov't Journal Article

**PubMedID:** 12403214

**Abstract:** The objective of the study was to assess the diagnostic performance of the reagent strip in screening for asymptomatic bacteriuria in pregnant women using urine culture as a gold standard. This study comprised 204 asymptomatic pregnant women who attended their first antenatal care at Srinagarind Hospital, Khon Kaen University from April 1, 1999 to June 30, 1999. Women with symptoms of urinary tract infection, antibiotic treatment within the previous 7 days, pregnancy-induced hypertension, bleeding per vagina and history of urinary tract diseases were excluded. Urine specimens were collected by clean caught midstream urine technique for urinalysis, reagent strip test and urine culture. Diagnostic performance of reagent strip in terms of sensitivity, specificity, positive and negative predictive value was analyzed. Urine reagent strip test had a sensitivity of 13.9 per cent, a specificity of 95.6 per cent, a positive predictive value of 46.1 per cent, a negative predictive value of 80.6 per cent in detecting asymptomatic bacteriuria in pregnant women.

**Database:** Medline

46. Urinalysis and urinary tract infection: update for clinicians.

**Author(s):** Young, J L; Soper, D E

**Source:** Infectious diseases in obstetrics and gynecology; 2001; vol. 9 (no. 4); p. 249-255

**Publication Date:** 2001

**Publication Type(s):** Journal Article Review

**PubMedID:** 11916184

**Available at** Infectious Diseases in Obstetrics and Gynecology - from Europe PubMed Central - Open Access

**Abstract:** Dysuria is a common presenting complaint of women and urinalysis is a valuable tool in the initial evaluation of this presentation. Clinicians need to be aware that pyuria is the best determinate of bacteriuria requiring therapy and that values significant for infection differ depending on the method of analysis. A hemocytometer yields a value of $> 10$ WBC/mm$^3$ significant for bacteriuria, while manual microscopy studies show $> 8$ WBC/high-power field reliably predicts a positive urine culture. In cases of uncomplicated symptomatic urinary tract infection, a positive value for nitrites and leukocyte esterase by urine dipstick can be treated without the need for a urine culture. Automated urinalysis used widely in large volume laboratories provides more sensitive detection of leukocytes and bacteria in the urine. With automated microscopy, a value of $> 2$ WBC/hpf is significant pyuria indicative of inflammation of the urinary tract. In complicated cases such as pregnancy, recurrent infection or renal involvement, further evaluation is necessary including manual microscopy and urine culture with sensitivities.

**Database:** Medline
47. Evaluation of the centrifuged and Gram-stained smear, urinalysis, and reagent strip testing to detect asymptomatic bacteriuria in obstetric patients

Author(s): McNair R.D.; MacDonald S.R.; Dooley S.L.; Peterson L.R.

Source: American Journal of Obstetrics and Gynecology; 2000; vol. 182 (no. 5); p. 1076-1079

Publication Date: 2000

Publication Type(s): Article

PubMedID: 10819832

Abstract: OBJECTIVE: Our purpose was to compare the efficacy of the centrifuged and Gram-stained smear with the efficacy of both urinalysis and reagent strip testing for nitrites and leukocyte esterase in detecting asymptomatic bacteriuria in obstetric patients. STUDY DESIGN: A midstream urine specimen was evaluated in 528 patients either at the initial prenatal visit or at a visit because of possible preterm labor. Separate aliquots were tested by centrifugation (with a Cytospin Cytocentrifuge; Shandon, Inc, Pittsburgh, Pa) with Gram stain, by microscopic urinalysis for the presence of moderate to large numbers of bacteria or >10 leukocytes per high-power field, and by reagent strips for the presence of nitrites or leukocyte esterase activity. Results were compared with those of a quantitative urine culture obtained with blood and MacConkey agar plates. RESULTS: Thirty-six women (6.8%) had urine cultures showing 100,000 colony-forming units of a uropathogen per milliliter. The sensitivity and specificity of testing by centrifugation and Gram stain were 100% and 7.7%, respectively. Urinalysis and dipstick testing offered a sensitivity of 80.6% and 47.2%, respectively, with a specificity of 71.5% and 80.3%. No combination of tests, in series or in parallel, offered improved specificity over urinalysis alone. CONCLUSIONS: Centrifugation with Gram stain of a urine specimen offers excellent sensitivity but very poor specificity compared with microscopic urinalysis for the detection of asymptomatic bacteriuria and is not an acceptable screening test in an obstetric population. The false-negative rates of urinalysis (19.4%) and reagent strip testing (52.8%) preclude these from being excellent screening tests for asymptomatic bacteriuria. Given the potential sequelae of undiagnosed asymptomatic bacteriuria in an obstetric population, we conclude that urine cultures should be used for all pregnant patients to detect asymptomatic bacteriuria.

Database: EMBASE
48. Screening for asymptomatic bacteriuria in pregnant women: urinalysis versus urine culture.

**Author(s):** Chongsomchai, C; Piansriwatchara, E; Lumbiganon, P; Pianthaweechai, K

**Source:** Journal of the Medical Association of Thailand = Chotmaihet thangphaet; Apr 1999; vol. 82 (no. 4); p. 369-373

**Publication Date:** Apr 1999

**Publication Type(s):** Research Support, Non-u.s. Gov't Comparative Study Journal Article

**PubMedID:** 10410499

**Abstract:** A diagnostic test study was conducted to evaluate the diagnostic performance of a simple urinalysis as a screening test for asymptomatic bacteriuria (ABU) in pregnant women. Seven hundred and seventy four asymptomatic pregnant women attending their first antenatal care at Srinagarind Hospital from June 1, 1994 to January 31, 1995 were studied. Simple urinalysis and urine culture were performed on all 774 subjects. The presence of > or = 5 WBC/HPF of centrifuged urine indicated a positive test. ABU was defined as the presence of > or = 10^5 colony forming units of single bacteria per milliliter of urine. Sensitivity, specificity, positive predictive value, negative predictive value and accuracy of simple urinalysis in detecting ABU, using urine culture as a gold standard were calculated. Simple urinalysis had a 18.4 per cent sensitivity, 97.2 per cent specificity, 45.7 per cent positive predictive value, 90.4 per cent negative predictive value and 88.4 per cent accuracy in detecting ABU. Because of its low sensitivity and the possible consequences of ABU, simple urinalysis should not be used as a screening test for ABU.

**Database:** Medline


**Author(s):** Tincello, D G; Richmond, D H

**Source:** BMJ (Clinical research ed.); Feb 1998; vol. 316 (no. 7129); p. 435-437

**Publication Date:** Feb 1998

**Publication Type(s):** Journal Article

**PubMedID:** 9492667

Available at [BMJ : British Medical Journal](https://www.bmj.com) - from PubMed Central

**Abstract:** OBJECTIVE To evaluate the performance of reagent test strips in screening pregnant women for asymptomatic bacteriuria at their first visit to an antenatal clinic. DESIGN Prospective case series. SETTING Antenatal clinic of a large inner city maternity hospital. SUBJECTS All women attending for their first antenatal clinic. Patients taking antibiotics for any reason and those with urinary tract symptoms were excluded. INTERVENTIONA midstream urine specimen was divided; half was sent for microscopy and formal bacteriological culture and the other half was tested with a commercial reagent strip test for the presence of blood, protein, nitrite, and leucocyte esterase. MAIN OUTCOME MEASURES Sensitivity, specificity, and positive and negative predictive values of the reagent strips in diagnosing asymptomatic bacteriuria (defined as 10^5 colony forming units/ml urine). RESULTS Sensitivity was low, with a maximum of 33% when all four tests were used in combination. Specificity was high, with typical values of 99% or more. Positive predictive value reached a maximum of 69% and negative predictive value was typically 95% or more. CONCLUSION Urine reagent strips are not sufficiently sensitive to be of use in the screening for asymptomatic bacteriuria and therefore many patients would be missed. In view of the potentially serious sequelae of this condition in pregnant women we recommend that formal bacteriological investigation remain the investigation of choice in this group of patients.

**Database:** Medline
50. A reassessment of the importance of 'low-count' bacteriuria in young women with acute urinary symptoms

**Author(s):** Kunin C.M.; White L.V.; Tong Hua Hua

**Source:** Annals of Internal Medicine; 1993; vol. 119 (no. 6); p. 454-460

**Publication Date:** 1993

**Publication Type(s):** Article

**PubMedID:** 8357110

**Abstract:**

**Objective:** To determine whether a statistical association exists between 'low-count' bacteriuria (>102 to 104 colony-forming units/mL) and acute urinary symptoms in young women.

**Design:** Prospective, case-control study. Setting: Gynecology clinic at a student health center.

**Patients:** Women with or without urinary or vaginal symptoms. Measurements: History of urinary infections and sexual activity; Quantitative determination of bacteriuria and pyuria and bacterial species; urine leukocyte esterase test; specific gravity; creatinine levels; vaginal leukocytes; and in-vitro culture of urine.

**Results:** The frequency of recent sexual activity, pregnancies, and contraceptive practices was not statistically different between women with acute urinary symptoms and asymptomatic controls. Escherichia coli and Staphylococcus saprophyticus were the only microorganisms statistically associated with urinary symptoms and pyuria (P < 0.001). Low counts of these organisms were found in 10.2% of asymptomatic women. As the bacterial count increased, the association between these organisms and symptoms increased, and a step-wise increase occurred in the frequency and magnitude of pyuria, but the specific gravity and urine creatinine levels remained unchanged. Escherichia coli, even at low counts, grew well in the patients' own urine. Pyuria (>20 leukocytes/mm³) was present in 19.6% of asymptomatic women and was associated with vaginal leukorrhea.

**Conclusions:** 'Low-count' bacteriuria was statistically more frequent among young women with urinary symptoms than among asymptomatic controls. The low counts could not be explained by dilution of the urine or failure of the bacteria to grow well in the patients' urine. These findings suggest that the infection was not established in the bladder urine and that 'low-count' bacteriuria might be an early phase of urinary tract infection.

**Database:** EMBASE
51. A study of various tests to detect asymptomatic urinary tract infections in an obstetric population.

**Author(s):** Bachman, J W; Heise, R H; Naessens, J M; Timmerman, M G

**Source:** JAMA; Oct 1993; vol. 270 (no. 16); p. 1971-1974

**Publication Date:** Oct 1993

**Publication Type(s):** Comparative Study Journal Article

**PubMedID:** 8411555

**Abstract:** OBJECTIVE To compare rapid screening techniques for detecting asymptomatic urinary tract infections (AUTIs) in pregnant women. DESIGN Comparison of results of the screening tests of urinalysis, urine dipstick, and Gram's staining with the results of standard urine culture at an initial prenatal visit. In follow-up visits, urine dipstick testing was compared with urinalysis. SETTING Departments of Family Medicine and Obstetrics and Gynecology, Mayo Clinic, Rochester, Minn. PATIENTS Pregnant women (1047) from the local community were screened for AUTI on initial and follow-up visits. METHODS Initial prenatal urine was tested by using urine dipstick testing, urinalysis, Gram's staining, and urine culture. At each follow-up visit, urine specimens were tested by using urine dipstick and urinalysis. MAIN OUTCOME MEASURES Sensitivity and specificity, incremental patient costs, and clinical outcomes were used to assess the effectiveness of the techniques. RESULTS On initial visits, rapid screening tests for AUTI in pregnant women revealed the following: Gram's staining identified 22 of 24 patients with AUTI (sensitivity, 91.7%; specificity, 89.2%); urine dipstick, 12 of 24 (sensitivity, 50.0%; specificity, 96.9%); and urinalysis with presence of leukocytes, six of 24 (sensitivity, 25.0%; specificity, 99.0%). In follow-up visits, urine dipstick tests detected 19 infections and urinalysis, three (positive predictive value, 5% compared with 3%). CONCLUSIONS Urine dipstick testing for nitrites identified half of all patients with urinary tract infections and was superior to urinalysis on follow-up visits. Although Gram's staining is more expensive, it was more accurate for AUTI than urinalysis or urine dipstick test for nitrites. Urinalysis was never the test of choice because it was more expensive and detected fewer positive cultures. Leukocyte measurement correlated poorly with AUTI.

**Database:** Medline

52. Prevention of preterm delivery and low birth weight associated with asymptomatic bacteriuria

**Author(s):** Mittendorf R.; Williams M.A.; Kass E.H.

**Source:** Clinical Infectious Diseases; 1992; vol. 14 (no. 4); p. 927-932

**Publication Date:** 1992

**Publication Type(s):** Review

**PubMedID:** 1533541

**Abstract:** Since the first report of an association between asymptomatic bacteriuria and low birth weight (<2,500 g) in 1962, >30 other studies on the same subject have been published. Some of these confirmed this association while others disputed it. Now, however, by using meta-analysis (a technique considered valid by many but not all statisticians) one may conclude with increased certainty that true associations between asymptomatic bacteriuria and preterm delivery (<37 weeks of gestation) and asymptomatic bacteriuria and low birth weight do exist. Because asymptomatic bacteriuria in pregnancy remains prevalent and preventable, a review of this important subject is relevant at this time.

**Database:** EMBASE
53. Screening for asymptomatic bacteriuria in pregnancy: urinalysis vs urine culture.

Author(s): Abyad, A

Source: The Journal of family practice; Nov 1991; vol. 33 (no. 5); p. 471-474

Publication Date: Nov 1991

Publication Type(s): Comparative Study Journal Article

PubMedID: 1940814

Abstract: BACKGROUND: Asymptomatic bacteriuria is common during pregnancy. Its average prevalence is 6%. It is an important risk factor for acute pyelonephritis, hypertension, preeclampsia, fetal wastage, low birthweight, and prematurity. This study was performed to determine the usefulness of urine microscopy as a substitute for doing a screening urine culture. METHODS: The medical records of all first trimester obstetric visits from 1984 to 1990 were reviewed at a major university. The results of 888 screening urinalyses were recorded and compared with those of subsequent urine cultures. RESULTS: Fifty-four cultures had growth of a single organism with a bacteria level of at least 1000 organisms per milliliter. In the prediction of a positive culture, the microscopic findings of five or more leukocytes per high-power field (HPF) showed a sensitivity of 94.4% and a specificity of 95.0%. CONCLUSION: Physicians should test the urine of all prenatal patients at their first visit and send to the laboratory only those specimens with 5 or more leukocytes per HPF. Using this method, unnecessary screening urine cultures will be substantially reduced.

Database: Medline

54. The nitrite and leukocyte esterase tests for the evaluation of asymptomatic bacteriuria in obstetric patients.

Author(s): Robertson, A W; Duff, P

Source: Obstetrics and gynecology; Jun 1988; vol. 71 (no. 6); p. 878-881

Publication Date: Jun 1988

Publication Type(s): Comparative Study Journal Article

PubMedID: 3285267

Abstract: The purpose of this investigation was to compare the reliability of a urine dipstick evaluation for nitrites and leukocyte esterase activity with that of a urine culture in diagnosing asymptomatic bacteriuria in obstetric patients. A clean-catch midstream urine specimen was obtained from 750 consecutive obstetric patients presenting for initial evaluation. One portion of the specimen was tested for nitrites and leukocyte esterase activity with Chemstrip LN dipsticks. A second aliquot of urine was plated on blood and MacConkey agar and incubated aerobically. The cost of the nitrite and leukocyte esterase test was $0.35. The per patient charge for the urine cultures would have been $28. Sixty-two women (8.3%) had urine cultures of 100,000 or more colony-forming units of a uropathogen per milliliter. The sensitivities of the nitrite and leukocyte esterase test in identifying patients with positive cultures were 43 and 77%, respectively, and the specificities were 99 and 96%, respectively. The sensitivity and specificity for the two tests combined (either test abnormal) were 92 and 95%, respectively. Five patients had negative screening tests but positive urine cultures; all five isolates were gram-positive organisms, three group B streptococci and two enterococci. We conclude that neither the nitrite test nor the leukocyte esterase test alone is a sensitive enough screening test to detect asymptomatic bacteriuria in obstetric patients. The combination of the two tests, however, may provide an acceptable cost-effective alternative to screening all asymptomatic obstetric patients with urine cultures.

Database: Medline
55. Leukocyte esterase activity in the rapid detection of urinary tract and lower genital tract infections in obstetric patients.

Author(s): Abbasi, I A; Hess, L W; Johnson, T R; McFadden, E; Chernow, B

Source: American journal of perinatology; Oct 1985; vol. 2 (no. 4); p. 311-313

Publication Date: Oct 1985

Publication Type(s): Journal Article

PubMedID: 4052183

Abstract: Infections of the vagina and urinary tract are important problems for the obstetrician. Examination of the vaginal discharge and urine for the presence of leukocytes is an important part of the evaluation for vaginitis and urinary tract infections. Neutrophils contain several esterases that are not present in serum, urine, or vaginal secretions. These esterases are not influenced by bacteria, commonly used drugs, or variable compositions of urine or vaginal secretions. A prospective study was performed to assess the sensitivity and specificity of leukocyte esterase activity as measured by dipstick (Chemstrip 9, Biodynamics) for the prediction of vaginitis and urinary tract infections during pregnancy. Results were compared with those obtained from potassium hydroxide smears, wet preps, and urine cultures. The vaginal discharge and urine of 65 patients was tested for leukocyte esterase activity on their initial OB visit. Leukocyte esterase was 100% sensitive and 100% specific for detecting urinary tract infections. It was 100% sensitive and 90% specific for predicting vaginal infections. Trichomonas infections accounted for the positive leukocyte esterase results when the urine culture was negative. On the basis of this study we believe that leukocyte esterase activity is sufficiently sensitive and specific to permit use of this test as a rapid and inexpensive screening procedure for vaginitis and urinary tract infections.

Database: Medline

56. The value of leucocyte excretion rates in determining "at risk" patient with asymptomatic bacilluria.

Author(s): Wren, B G

Source: The Journal of obstetrics and gynaecology of the British Commonwealth; Feb 1971; vol. 78 (no. 2); p. 130-135

Publication Date: Feb 1971

Publication Type(s): Journal Article

PubMedID: 5105190

Database: Medline
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