

Screening For Asymptomatic Bacteriuria During Pregnancy-Dipstick Urine Analysis Versus Simple Microscopic Urine Analysis

Thesis

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List of Abbreviations

ANC.....	Antenatal care.
ASB	Asymptomatic bacteriuria.
CFU	Colony forming unit.
IL	Interleukine.
LE	Leukocyte esterase test.
Lesn	combined leukocyte esterase test with nitrite test.
ME	Microscopic examination.
NPV	Negative predictive value
PH	Potential hydrogen
POR	Prevalence odds ratio
PPROM	Preterm premature rupture of membranes
PPV	Positive predictive value
PTL	Preterm labour
ROC.....	Receiver operating characteristic
SD	Standard deviation
THP	Tamm-Horsfall Protein
UTI	Urinary tract infection.

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Introduction

INTRODUCTION

*A*symptomatic bacteriuria is defined as a finding of more than 10^5 CFU/ml of urine in a clinically asymptomatic person (*Delzell et al., 2000*).

The prevalence of asymptomatic bacteriuria during pregnancy ranges from about 2 to 10% (*Fiona, 2007*).

A urine culture obtained at 12-16 weeks of pregnancy will identify 80% of women who will ultimately have asymptomatic bacteriuria in pregnancy, with an additional 1-2% identified by repeated monthly screening (*Nicolle et al., 1994*).

US. Preventive Services Task Force (2010) (USPSTF) recommends screening 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.)

There are a number of conditions associated with an increased prevalence of asymptomatic bacteriuria in pregnancy. Low socio-economic status, sickle trait, diabetes mellitus and grand multiparity have been

reported; each is associated with two-fold increase in the rate of bacteriuria (*Kiningham, 1993*).

Schieve and associates conducted a study involving 25,746 pregnant women and found that the presence of UTI was associated with preterm labor, hypertensive disorders of pregnancy, anemia and amnionitis (*Delzell et al., 2000*).

Initial studies reported 20% to 27% of women with asymptomatic bacteriuria developed pyelonephritis compared to 0.4% to 1.2% of those without bacteriuria. A more recent study reported 13% of untreated women with asymptomatic bacteriuria developed pyelonephritis, compared with 0.4% of those with negative screening cultures (*Nicolle et al., 1994*).

Women with urinary infection (UTI) associated pregnancy had a fetal mortality rate 2.4 times greater, low birth rate 2.04 times greater, and prematurity 2.4 times greater than those without urinary infection (*Nicolle et al., 1994*).

The mechanism by which asymptomatic bacteriuria promotes preterm labour is not clear, but

subclinical amnionitis or phospholipid A2 production by bacteria have been proposed (*Nicolle et al., 1994*).

A number of studies suggest that urinary tract infection (UTI) during the course of gestation is associated with elevated risk for preeclampsia (*Anatte Karmon et al., 2008*).

The organisms that cause UTIs during pregnancy are the same as those found in non-pregnant patients. *Escherichia coli* accounts for 80 to 90 percent of infections. Other gram-negative rods such as *Proteus mirabilis* and *Klebsiella pneumoniae* are also common. Gram-positive organisms such as group B streptococcus and *Staphylococcus saprophyticus* are less common causes of UTI (*John et al., 2000*).

Due to the high prevalence of asymptomatic bacteriuria in pregnancy and its serious consequences, it is justifiable to screen for this condition in pregnancy.

In a prospective longitudinal study over a 2-year period from 2000 to 2001, the incidence of hospitalization for acute pyelonephritis was 1.4%, less than the 3-4% rate reported in the early 1970s before

screening for asymptomatic bacteriuria became routine (**Fiona, 2007**).

While most authors agree on the need for early urine screening, the best screening test to be used remains to be determined (**Littenberg et al., 1991**).

The gold standard for detection of bacteriuria is urine culture, but this test is costly and takes 24 to 48hrs to obtain results. The accuracy of faster screening methods (e.g., leukocyte esterase dipstick, nitrite dipstick, urinalysis and urine Gram staining) has been evaluated (**Delzell et al., 2000**).

Nitrite test depends on the ability of most enteric bacteria to reduce nitrates to nitrites (**Mittendorf, 1992**).

The dipstick leukocyte esterase (LE) test, which detects esterases released from degraded white blood cells, is an indirect test for bacteriuria (leukocytes are lysed in urine at pH value >6.0) (**Martina Franz et al., 1999**).

Examination of the sediment by microscopic urinalysis to detect bacteria and white blood cells has

also been evaluated as a screening test for bacteriuria (***Bachman, 1993***).

Contamination is sometimes unavoidable and remains a pitfall in the diagnosis of UTI. Contamination is likely if only small number of bacteria or several bacterial species grow in the urinary culture. Lactobacilli, Corynebacteria species, Gardenella, α -haemolytic streptococci and aerobes are considered urethral and vaginal contamination (***Martina Franz et al., 1999***).

Therefore it is recommended that physicians will have to balance between the cost and effectiveness of the screening test before deciding on it.