

Prevalence of asymptomatic bacteriuria with preterm labor

Abd El-moniem Mohamed Zakaria¹, Hany Maged Hassan¹, Mekky Abd El-moniem Ali² and Mohamed Ibrahim Soliman³.

¹Department of Obstetrics and Gynecology, Faculty of Medicine, Al-Azhar University, Egypt.

¹Department of Clinical Pathology, Faculty of Medicine, Al-Azhar University, Egypt.

³Resident of Obstetrics and Gynecology - Helwan general hospital, Egypt.

dr.m.soliman86@gmail.com

Abstract: Aim of work: The aim of this work is to assess the prevalence of asymptomatic bacteriuria in patients attending Helwan general hospital and Bab El- Sharya hospital who presented with pre term labor IN 2016. **Methods.** prospective study of 200 women from those attending the department of obstetrics and gynecology of Helwan and Bab el Sharya hospitals obstetric outpatient clinics at 2016. All these patients had given mid-stream clean catch urine sample for which urine culture for asymptomatic bacteriuria was done as well as antibiotic sensitivity test to know the organism and proper antibiotic to be given. **Results:** this study showed that 8% of the pregnant women examined had a positive urine culture without any symptoms of UTI. Hence, it is important that pregnant women are screened for asymptomatic bacteriuria at the first antenatal visit. **Conclusion:** Asymptomatic bacteriuria is a major risk factor for the development of urinary tract infection during pregnancy, the prevalence of asymptomatic bacteriuria in our locality is high. The significance of asymptomatic bacteriuria in pregnancy lies in its potential to cause acute pyelonephritis, preterm labor and preterm rupture of membranes. Others include anemia, pre-eclampsia, chronic pyelonephritis and even fetal wastage.

[Abd El-moniem Mohamed Zakaria, Hany Maged Hassan, Mekky Abd El-moniem Ali and Mohamed Ibrahim Soliman. **Prevalence of asymptomatic bacteriuria with preterm labor.** *N Y Sci J* 2017;10(2):31-35]. ISSN 1554-0200 (print); ISSN 2375-723X (online). <http://www.sciencepub.net/newyork>. 7. doi:[10.7537/marsnys100217.07](https://doi.org/10.7537/marsnys100217.07).

Key wards: Asymptomatic bacteriuria, preterm labor, pyelonephritis.

1. Introduction:

The urinary tract is second only to the respiratory tract in acquiring microbial infections, especially in females. Urinary tract infections (UTI) are more common in pregnant than non-pregnant women (*Oman Med J. 2012 Jan*) Asymptomatic bacteriuria (ASB) is defined as the presence of actively multiplying bacteria in the urinary tract excluding the distal urethra in a patient without any obvious symptoms. This is confirmed in the presence of significant bacteriuria based on isolation of 10⁵ cfu/ml of same species of bacteria in properly collected and transported midstream urine during a screening test.

The physiologic changes of pregnancy predispose patients to bacteriuria. These physiological changes include urinary retention from the weight of the enlarging uterus and urinary stasis due to ureteral smooth muscle relaxation (caused by increases in progesterone).

Although progesterone influence causes a relative dilation of the ureters, ureteral tone progressively increases above the pelvic brim during pregnancy. However, controversy exists as to whether bladder pressure increase or decrease during pregnancy. In addition, glucosuria and aminoaciduria during pregnancy provide an excellent culture medium for bacteria in areas of urine stasis. These changes, along short urethra (approximately three to four

centimeters in females and difficulty with hygiene due a distended, pregnant belly, cause urinary tract infections (UTIs) to become a common occurrence for pregnant women (*Harris et al., 2004*).

Infection can be limited to the lower urinary tract (cystitis involving the bladder and urethra) or the upper tract (pyelonephritis). Complicated urinary tract infections can occur in either the upper or lower urinary tract but are accompanied by an underlying condition that increase the risk for failing therapy, such as obstruction, urologic dysfunction, or resistant pathogens. Most urinary tract infections occur via an ascending route (*Hill et al., 2000*).

The significance of asymptomatic bacteriuria in pregnancy lies in its potential to cause acute pyelonephritis, preterm labor and preterm rupture of membranes. Others include anemia, pre-eclampsia, chronic pyelonephritis and even fetal wastage. (*Oman Med J. 2012 Jan*). It is associated with acute pyelonephritis in 25-30% of pregnant women compared with 1-2% in those without asymptomatic bacteriuria.

2. Subjects and methods:

Study Approval: The study was approved by the Ethical Committee of Alazhar University.

Subject: prospective study of 200 women from those attending the department of obstetrics and gynecology

of Helwan and Bab el Sharya hospitals obstetric outpatient clinics at 2016.

The inclusion criteria:

1. Age from (15-30)
2. pregnancy (20-37 weeks).
3. perterm labour pains.

The Exclusion criteria:

1. Women known to be diabetic.
2. Women who are immunocompromised as in long term corticosteroid therapy.
3. Women using vaginal douches.
4. Any type of vaginal bleeding.
5. Women already on antibiotic therapy.

All women will be submitted to:

Complete history: Complain - Present and past history- obstetric history - menstrual history, family planning history.- DM.

Complaint and present history: patient had visited Helwan and Bab El Sharya hospitals obstetric outpatient clinics for antenatal care and ER.

2. Physical examination

A- General examination: Vital data (to exclude cases of acutepylonephritis); pulse, blood pressure and temperature.

B- Abdominal examination including palpation of loins and renal angles for any tenderness, swellings or rigidity.

3. Investigations:

A- Ultrasonography to ensure fetal life and gestational age.

B- Laboratory investigations: Urine culture and sensitivity test.

C- C.T.G to ensure uterine contractions by using contraction probe.

3. Results:

Table (1): Description of age and gestational age among the studied cases (n =200). ASB was found in 17 per cent pregnant women till 28 wk. and in 16 per cent between till 36 wk. of gestation, preterm labor (PTL) was seen in late detected women (34-36 wk.) as compared to ASB negative women, whereas no significant difference was seen in early detected women (till 20 wk.) as compared to ASB negative women.

Table (2): Past history of UTI among the studied cases (n = 200). This table indicates that 18% of studied population had a positive past history of UTI.

Table (3): Results of urine culture shows the results of the urine culture of the 200 pregnant women screened. A total of 200 women had asymptomatic bacteriuria on urine culture, giving a prevalence of 16 %. (92 %) had no growth on culture.

Table (4): Comparison between prognosis of the pregnancy cases that were presented with preterm labor pains and who responses to the inpatient treatment and the cases that were delivered as a preterm labor.

Table (5): Description of different organisms among cases with positive culture (n = 16)

This table indicates that E. coli was considered the most prevalent organism as it was present in more than 75% of the positive cases.

Table (1): Description of age and gestational age among the studied cases (n = 200).

	Range		Mean \pm SD
Age (years)	15 – 30		24.9 \pm 4.6
Gestational age (weeks)	14 – 36		20.1 \pm 3.2
Till 28 weeks		(17%)	
Till 36 weeks		(16%)	

Table (2): Past history of UTI among the studied cases (n = 200)

Past history of UTI	Number of cases	Percent
No	164	82
Yes	36	18

Table 3 Results of urine culture.

Cases	Total number of patients (%)
Growth	16 (8 %)
No growth	184 (92 %)
Total	200 (100%)

Table (4): Comparison between prognosis of the pregnancy cases that were presented with preterm labor pains and who responses to the inpatient treatment and the cases that were delivered as a preterm labor.

Total Number of cases (200)	Gestational age	+VE cases	Cases that continue pregnancy after inpatient treatment	Cases were delivered at this age
	28 week	4	3	1
	32 week	6	4	2
	35 week	6	6	1

Table (5): Description of different organisms among cases with positive culture (n = 16)

	Number of cases	Percent
E.coli	12	75
Pseudomonas	2	12.5
Klebsiella	2	12.5

4. Discussion:

Urinary tract infections are relatively common problems during pregnancy. The physiologic changes related to pregnancy make healthy women susceptible to serious infectious complications, arising from conditions such as asymptomatic and symptomatic urinary tract infections. The combination of mechanical, hormonal and physiologic changes during pregnancy contributes to significant changes in the urinary tract, which has a profound impact on the acquisition and natural history of bacteriuria during pregnancy (**Patterson and Andriole, 1997**). This includes dilatation of the ureter, decrease in ureteral peristalsis and decrease in bladder tone. Additionally, the physiologic increase in plasma volume during pregnancy decreases urine concentration and increases urinary progesterins and estrogens, which may lead to a decreased ability of the lower urinary tract to resist invading bacteria (Isabel et al., 2003).

In the past years, researchers have spent considerable time and effort investigating the frequency of occurrence and consequences of asymptomatic bacteriuria in pregnancy. The traditional definition of asymptomatic bacteriuria is the presence of > 100,000 colony forming units per ml of urine of a single pathogen in two consecutive mid-stream, clean catch urine specimens or one catheterization specimen from an individual without symptoms of urinary tract infection (**Kiningham, 1993**). Earlier studies showed that the prevalence of asymptomatic bacteriuria ranged from 2.5-15%. Other studies showed the prevalence to be 4-7% (**Krieger, 1989; Patterson, 1997 and Maranchie et al., 1997**). This variation is explained by the population characteristics, the screening methodology and definition of bacteriuria. It has been suggested that the

frequency of bacteriuria increases by about 1% during pregnancy. The risk of acquiring bacteriuria increases with the duration of pregnancy from 0.8% of bacteriuric women in the 12th gestational week to 2% at the end of pregnancy (**Stenqvist et al., 1989**).

The significance of asymptomatic bacteriuria lies in its potential to cause acute pyelonephritis, which develops in one third of the pregnant women with untreated bacteriuria (**Lucas and Cunningtarn, 1993**). In addition to symptomatic urinary tract infection, a variety of conditions has been reported to be associated with asymptomatic bacteriuria. Of these are preterm labor, low birth weight, prematurity, pre-eclampsia and chronic renal disease that has been cited as significant adverse obstetric outcome and medical conditions (**Kunin, 1992**). Thus, early detection and treatment can possibly decrease the occurrence of the side effects. The relatively high prevalence of asymptomatic bacteriuria during pregnancy, the significant consequences for women and for the pregnancy, plus the opportunity to avoid sequelae with treatment justify screening pregnant women for bacteriuria (**Isabel et al., 2003**).

The aim of this work was to assess the prevalence of asymptomatic bacteriuria in primigravid patients during third trimester in those attending Helwan and Bab el sharia hospitals.

This study included 200 patients during third trimester. Clean each urine specimen was taken from all the patients and urine culture and sensitivity was done as a screening tool of asymptomatic bacteriuria (urine culture > 105 colony forming unit / ml).

In this study the mean of age of the studied cases was 24.9 years, The mean gestational age of the studied cases was 28.

Among the 200 women included in this study, 16 had bacteriuria giving a prevalence of 8% (Table 3).

The increase of ASB with gestational age might be attributed to the accentuation of maternal anatomical and functional changes of pregnancy from trimester to trimester.

As regards the previous history of UTI, our results showed that 75% of the studied women had negative past history of urinary tract infection, while 25% had a positive past history of UTI (table 2). The prevalence of ASB among patients with previous

history of UTI was higher (20%) than patient with no history of UTI with this pregnancy.

This may be explained by the fact that previous infection may have caused anatomical and/or functional damage to the urinary tract. Moreover, several predisposing factors that could have resulted in previous UTI may be still present eg. Urinary tract stones or bad toilet habits.

The microbiology of bacteriuria in this study (table 4) is similar to most reported studies. *Escherichia coli* was the most common pathogen (75%), followed by *Pseudomonas* (12.5%) and *Klebsiella* (12.5%). As a comparison with our study, similar findings have been reported by other researchers (Chongsomchai et al., 1999; Mohammad et al., 2002). *E. coli* is the most common microorganism in the vaginal and rectal area, and because of the anatomical and the functional changes that occur during pregnancy, the risk of acquiring UTI from *E. coli* is high (Mohammad et al., 2002).

Tugrul (2005) in his study in Turkey found that 77.8 % of the positive samples were infected by *E. coli*. On the other hand Akerele et al., (2001) found out that *Staph. aureus* (29.8 %), *E. coli* (29.1 %) & *Klebsiella* (21.5) % were the commonest organisms. The difference in geographic location & climate could be a possible reason for the difference in organisms prevalence due to different organisms' habitat.

The antibiotic sensitivity patterns were showed in table (5), showing that most of the bacterial isolates were sensitive to imipenem (62.5%), cefoperazone (50%), and nitrofurantoin (62.5%). As a comparison with the study done by Abdallah & Al-Mosleh (2005), which concluded that the most sensitive antibiotic was gentamycin & augmentin. Akerele et al. (2001) found that the most prevalent antimicrobial was Augmentin (71.4 %), ceftazidime (81.6 %), nitrofurantoin (61%) and gentamycin (56.9 %) The choice of antibiotic should be based on urine culture, stage of gestation, maternal clinical data and the characteristics of the antibiotic (Grio et al., 1994). However, aggressive antibiotic treatment may be necessary to reduce the risk of pyelonephritis in pregnancy (Small 2001; Gratacos et al., 1994). All pregnant women with persistent bacteriuria or recurrent infection need follow-up cultures and a urological evaluation after delivery (Patterson and Andriol, 1997). Single urine culture misses more than half the cases of asymptomatic bacteriuria. Thus, culture in each trimester is recommended (McIsaac et al., 2005).

In this study the prevalence of ASB was higher in patients with no antenatal care (21.73 %) than those with regular antenatal visits (3.89 %) table 8.

In this study we found 16 +ve case form original 200 case the Comparison between prognosis of the pregnancy cases that were presented with preterm

labor pains and who responses to the inpatient and antibiotic treatment we found the cases that response to this treatment 3 cases till 28 weeks, 4 cases till 2 weeks and 6 cases till 35 weeks (table 9).

The cases that were delivered as a preterm deliveries were 4 cases (table 9).

In conclusion, this study showed that 8% of the pregnant women examined had a positive urine culture without any symptoms of UTI. Hence, it is important that pregnant women are screened for asymptomatic bacteriuria at the first antenatal visit, and as a part of routine antenatal care in each trimester.

Conclusion:

This study showed that 8% of the pregnant women examined had a positive urine culture without any symptoms of UTI. Hence, it is important that pregnant women are screened for asymptomatic bacteriuria at the first antenatal visit.

Conflict of interest:

The authors declare that they have no conflict of interest.

References:

1. Abdullah A, Al-Moslih M (2005): Prevalence of asymptomatic bacteriuria in pregnant women in Sharjah, United Arab Emirates. *East Mediter Health J*; 11(5-6): 1045-52.
2. Akerele J, Abhdimen P, Okonofua F (2006): Prevalence of asymptomatic bacteriuria among pregnant women in Benin city, Nigeria. *J Obstet Gynaecol*; 21: 141-4.
3. Akinloye O, Ogbolu DO, Akinloye OM, et al. (2006): Asymptomatic bacteriuria of pregnancy in Ibadan, Nigeria: a re-assessment. *Br J Biomed Sci*; 63(3): 109-12.
4. Anon (1998): British Medical Association and Royal Pharmaceutical Society of Great Britain, British National Formulary, p. 36.
5. Aslan D, Aslan G, Yamazhan M, Ispahi C, Tinar S (2004): Voiding symptoms in pregnancy: an assessment with international prostate symptom score. *Gynecol Obstet Invest.*; 55: 46-9.
6. Bacak SJ, Callaghan WM, Dietz PM, Crouse C (2005): Pregnancy associated hospitalizations in the United States, *Am J Obstet Gynecol* 192: 592-7.
7. Bandyopadhyay S, Thakur J, Ray P, et al. (2005): High prevalence of bacteriuria in pregnancy and its screening methods in North India. *J Indian Med Assoc*; 103:259-62,266.
8. Benedicte C (2001): Use of antibiotics to treat bacteriuria of pregnancy in the Nordic countries. Which antibiotics are appropriate to treat

- bacteriuria of pregnancy?. *Int J Antimicrob Agents* 17;283—85.
9. Blumberg, Emily A, Ellas A (2000): Method for the reduction of urinary tract infection. *Curr opi urol*; 7: 47-51.
 10. Citiak KA, Newton JR (1985): Serial maternal nephro- sonography in pregnancy. *Br J Radiol*; 58.
 11. Conrad KP, Lindheimer MD (2006): Renal and cardiovascular alterations. In: Lindheimer MD, Roberts JM, Cunningham FG, editors. *Chesley's hypertensive disorders in pregnancy*. 2nd edition. Stamford (CT): Appleton and Lange; p. 263-326.
 12. Conrad KP, Novak J, Danielson LA, et al (2005): Mechanisms of renal vasodilation and hyperfiltration during pregnancy: current perspectives and potential implications for preeclampsia. *Endothelium*; 12: 57-62.
 13. Cunningham FG, Leveno KJ, Bloom ST (2005): *Williams obstetrics*: Seils A, Noujaims S, Davis K. eds. 22nd ed. *Maternal physiology*. McGraw-Hill; (8).
 14. De Sweit S (2002): Renal Disease. In: *Medical disorder in obstetric practice*. Forth edition, Blackwell Publishing Company, p. 198-202.
 15. Delzell J, Lefevre M (2000): Urinary tract infections during pregnancy. *Am Fam Phys*; 61: 713-21.
 16. DeSwiet M (2002): *Medical disorders in obstetric practice*. Blackwell Publishing Ltd; 7: 132-34.
 17. Edmund FF, Charles JL, Theodore WP et al. (2008): *Renal and urinary tract physiology in pregnant women*.
 18. *Encyclopedia of public health* (2002): The gale group.
 19. Fatima N, Ishrat S (2006): Frequency and risk factors of asymptomatic bacteriuria during pregnancy. *JCPSP* Vol. 16 (4): 273-275.

1/25/2017