



## Original Research Article

## Comparative study of UTI in high-risk pregnant patients and patients attending to ANC clinics

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## ABSTRACT

**Background:** Asymptomatic bacteriuria, UTI and pyelonephritis increase risk of preterm labour and premature rupture of the membranes which results indirectly in worse foetal outcome which was highlighted in this study. Also, the number of drug resistant pathogens are increasing as these high-risk pregnant patients are more prone for instrumentation, procedures which indirectly exposes the patients to hospital acquired pathogens.

**Materials and Methods:** In this prospective study, a total of 200 mid-stream urine samples were collected aseptically from randomly selected high risk pregnant women (100) and (100) from normal ANC patients attending ANC clinics.

**Results:** Out of 100 samples in high-risk pregnancy patients, 44% yielded monobacterial growth, 8% yielded polybacterial growth. *E.coli* was most common (46%), *Klebsiella spp* (25%), *Staphylococcus aureus* (15.3%), *Enterococcus spp* 3.8%, *Acinetobacter spp* 2%. 26.9% showed growth  $>10^5$ CFU/ml, 32.6% showed growth  $10^3$ –  $10^5$  CFU/ml, 15.3% showed growth  $<10^3$  CFU/ml. Out of 100 samples from normal ANC patients all showed monobacterial growth(42%). *Staphylococcus sp.* was most common organism isolated 56.2% followed by *Escherichia coli* 26%, *Acinetobacterspecies* 4%, *Klebsiella species* 2%, *Pseudomonas species* 2%. All organisms showed growth range in between  $10^3$ CFU/ml to  $10^5$ CFU/ml. None of the isolate was pan drug resistant as compared to complicated pregnancy subset.

**Conclusion:** So, there should be a proper management guideline whenever the pregnant females presents with complication. The organism should always be tested for sensitivity before starting empirical antibiotic treatment. Also, the number of ANC visits should be monitored judiciously as to know if we are not unknowingly bombarding the pathogens in normal patients.

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## 1. Introduction

UTI is common during pregnancy, apparently because of urinary stasis, which results from hormonal ureteral dilation, hormonal ureteral hypoperistalsis and pressure of

the expanding uterus against the ureters. Asymptomatic bacteriuria occurs in about 15% of pregnancies and sometimes progresses to symptomatic cystitis or pyelonephritis. Frank UTI is not always preceded by asymptomatic bacteriuria. Asymptomatic bacteriuria, UTI and pyelonephritis increase risk of preterm labour and premature rupture of the membranes which results

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indirectly in worse foetal outcome.<sup>1</sup>

A pregnancy is defined as 'high risk' if the mother or fetus suffer from complications that may interfere with the normal completion of the pregnancy. These include various background problems such as, kidney disease, diabetes, epilepsy, hypertension, asthma, chronic and congenital heart disease; problems which occur during pregnancy such as preeclampsia, heavy bleeding, shortening of the cervix, rupture of membranes, placental separation, decrease in amniotic fluid, preterm labor; and issues related to the fetus such as abnormal growth, increase or decrease in amniotic fluid, fetal anemia or birth defects.<sup>2,3</sup>

High risk pregnancies are always a threat to the health of the mother, her fetus in the antepartum, intrapartum or post-partum period. Expectant mothers with high risk pregnancies are at a greater risk for nosocomial UTI, because of the state of pregnancy itself, frequent ANC visits, hospitalization and undue diagnostic & therapeutic procedures.<sup>4</sup>

High risk pregnant patients tend to visit hospital more frequently, these patients are more exposed to instrumentation, and procedures which predispose them for colonization with hospital acquired pathogens. These hospital-acquired strains are mostly multi drug resistant which makes the journey of these high-risk pregnant patients more difficult. There are less treatment options available as all the drugs cannot be prescribed to pregnant patients.

**2. Materials and Methods**

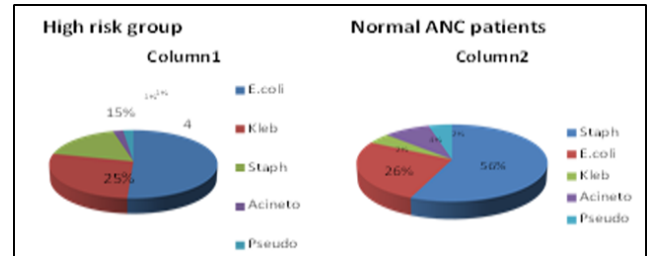
In this prospective study, a total of 200 mid-stream urine samples were collected aseptically from randomly selected high risk pregnant women (100) and (100) from normal ANC patients attending ANC clinics. Samples were put on to culture & were identified as per the standards methods. AST was performed under CLSI guidelines.

**3. Results**

Out of 100 samples in complicated pregnancy group, 44% yielded monobacterial growth, 8% yielded polybacterial growth. *E.coli* was most common 24(46%), *Klebsiella spp* 13(25%), *Staphylococcus aureus* 8(15.3%), *Enterococcus spp* 2(3.8%), *Acinetobacter spp* 1(2%). 14(26.9%) showed growth >10<sup>5</sup>CFU/ml, 17(32.6%) showed growth 10<sup>3</sup>– 10<sup>5</sup> CFU/ml, 8(15.3%) showed growth <10<sup>3</sup> CFU/ml. Among the *E.coli* isolates 16(66%, n=24) were ESBL producers, 7(29%, n=24) were Amp C producers, 4(16.6%,n=24) were MBL producers. Among *Klebsiella spp* 11(84.6%, n=13) were ESBL producers, 6(46%, n=13) were Amp C producers, 2(15.3%, n=13) were MBL producers & 2(25%, n=8) were MRSA.

Out of 100 samples from normal ANC patients all showed monobacterial growth (42%). *Staphylococcus*

*aureus* was most common organism isolated 26(56.2%) followed by *Escherichia coli* 12(26%), *Acinetobacter species* 4%, *Klebsiella species* 2%, *Pseudomonas species* 2%. All organisms showed growth range in between 10<sup>3</sup>CFU/ml to 10<sup>5</sup>CFU/ml. None of the isolate was pan drug resistant as compared to complicated pregnancy patients.



**Fig. 1:** Organism pattern

**Table 1:** MDR pathogens in different clinical condition of high-risk pregnancy

Clinical condition	No of cases	MDR	Neonatal Mortality
PROM	26	8	2
Mild PE	43	15	-
Severe PE	12	6	2
Adv Gestational age	2	-	1
Abruptio placenta	5	1	-
Rh neg preg	3	-	-
Ectopic preg	1	-	-
Hashimoto's thyroiditis	1	-	-
Severe anaemia	1	-	-
Cord prolapse	1	-	-
Teratoma	2	-	-
Asthma	1	-	-

**4. Discussion**

UTI occurs at any age and in any sex, but more so in pregnant women, probably due to physiological and hormonal changes. After 6th week of gestation, the uterus dilates, resulting in production of progesterone and estrogen which lowers the tone of the uterus. Increased plasma volume in pregnancy leads to concentration of urine and increase in bladder volume. All this leads to urinary stasis and uretero vesicle reflex. In our study we observed that the patients who had uncomplicated pregnancy or in other words whose hospital stay time was less showed less resistance rates. This is also in relation with the number of ANC visits. Women who visited hospital more frequently or stayed for a longer time due to any complication were showing greater number of pan drug resistant bacteria than normal subset of patients.

Patients with complication in pregnancy gave higher drug resistant bacteria as compared to normal patient subset.

In these subset of patients, only frequent ANC visits or visits to the hospital due to any other cause were seen. These results can be correlated to worse maternal and fetal outcome as in the complicated pregnancy subgroup fetal deaths were reported. There should be a proper management guideline whenever the pregnant females present with complication. The organism should always be tested for sensitivity before starting empirical antibiotic treatment. Also, the number of ANC visits should be monitored as to know if we are not unknowingly bombarding the pathogens in normal patients.<sup>5,6</sup>

## 5. Conclusion

There should be a proper management guideline whenever the pregnant females present with complication. The organism should always be tested for sensitivity before starting empirical antibiotic treatment. Also, the number of ANC visits should be monitored judiciously as to know if we are not unknowingly bombarding the pathogens in normal patients. Apart from this, pregnant females should protect themselves from Zika virus, maintain proper hygiene, avoid contact with pets and rodents, do not consume unpasteurized milk, and get tested for sexually transmitted diseases (STD).

## 6. Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

## 7. Source of Funding

None.

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