

# A Study of Genito-Urinary Infections as a Risk Factor for Pre-Term Labour, Prom & Pprom in a Tertiary Care Centre

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**Abstract:** *Pregnancy-related urinary tract infections (UTTI) account for 20% of all obstetrical ward admissions. The risk of pre-eclampsia, low birth weight, cesarean births, sepsis, shock, renal failure, and premature birth can be increased. Incidence of PPRM in India ranges about 2.2-4 % and PROM ranges about 9.8%. Prevalence of Genito-urinary tract infections increase in pregnant women, so the prevalence of Pre-Term Labour (PTL), PROM and PPRM increases as well. A prospective, observational study was conducted in a Tertiary care centre of Srikakulam, Andhra Pradesh for a duration of 6 months. The purpose of this study is to determine the prevalence of genitourinary infections in patients with PTL, PROM and PPRM as well as to investigate the various risk factors for genitourinary infections during pregnancy.*

**Keywords:** Genito Urinary Infection, Pre-Term Labour

## 1. Introduction

Genitourinary infections during pregnancy continue to pose a significant clinical issue<sup>1,2</sup>.

Drug-resistant E Coli is the commonest organism responsible for UTI in pregnancy<sup>3</sup>.

UTI is seen in 20% of the pregnant women and it is the most common reason for admission in obstetrical wards<sup>4</sup>. UTI can increase the risk of pre-eclampsia, low birth weight, caesarean deliveries, sepsis, shock, transient renal failure, premature birth<sup>5,6</sup>.

Regular screening of pregnant women for UTI especially during their 1<sup>st</sup> prenatal visit can reduce the incidence of these complications<sup>6</sup>.

Infections can lead to complications like chorioamnionitis, Preterm labour, Neonatal sepsis and PID<sup>10,11</sup>.

So, this study is conducted to know the prevalence of Preterm labour and PPRM and to identify the association of Genitourinary infections in patients with PTL and PPRM<sup>13</sup> and study the various risk factors for genitourinary infections during pregnancy in a tertiary care centre like GEMS which is situated in a rural area of Andhra Pradesh.

## Aims & Objectives

### Objectives

- 1) To analyse the prevalence of PTL, PROM and PPRM in pregnancy and its association with Genito-urinary infections.
- 2) To identify the spectrum of bacteria from midstream urine, endocervical swab, vaginal swab cultures in patients with PRE-TERM LABOUR, PPRM and PROM
- 3) To determine various factors linked to genitourinary

infections by clinical and laboratory investigations among women admitted.

## 2. Methodology

The current study was conducted in the Department of Obstetrics and Gynaecology, Great Eastern Medical School & Hospital, Srikakulam, Andhra Pradesh, India.

**Study period:** July 2023 to December 2023

**Study Design:** Prospective, Observational study.

**Sampling procedure:** Convenience sampling

**Sample size calculation:** On average 8-10 Antenatal women are admitted for delivery into

Our institution as per the Centres for Disease Control and Prevention, the prevalence of Preterm labour was 10%<sup>25</sup>. The minimal sample size came to be 300 overall.

Hence, we included 300 patients in our study.

**Inclusion Criteria:** All cases of Pre-term labor, Threatened Preterm Labor, PPRM and PROM admitted in GEMS after 28 weeks Gestational age with booked visits since 1<sup>st</sup> trimester. \*(Gestational age confirmed by LMP or USG).

### Exclusion Criteria:

Term labour with intact membranes, PROM with polyhydramnios, patients with multifetal gestation, PROM resulting from invasive techniques like amniocentesis, cordocentesis and cervical cerclage, history of Antepartum Haemorrhage, patients with genital tract malignancy and history of usage of antibiotics in the last one week.

- Exclusion criteria was assessed mainly through oral history, medical records, physical, obstetric examination

Volume 13 Issue 6, June 2024

Fully Refereed | Open Access | Double Blind Peer Reviewed Journal

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to rule out the above-mentioned conditions.

- The data of all 300 women was complete.
- All patients provided consent for the study.

A detailed antenatal history and clinical examination is done on all antenatal mothers at the time of admission. Age, parity, the period of gestation, time of onset of labour, duration of rupture of membranes and h/o vaginal discharge are noted. All the women were advised to wash hands and clean perineum with water and to part the labia with one hand and to collect urine sample in the midstream. This sample was sent to laboratory within two hours. The sample was divided into two parts. One part of urine sample was tested for the presence of albumin, sugar and pus cells along with colony count. Another part was tested for culture and sensitivity.

After visualising the cervix and vagina with cusco's speculum a high vaginal swab, an endocervical swab is also taken and sent for culture & sensitivity.

**Parameters assessed:**

**Demographic data:** Age, Socio economic status

**Obstetric Data:** Gravida, Parity, Abortions, Live, dead, Gestational age,

**Past history:** UTI or genital infections, Presence of recurrent infection, previous reports of urine microscopy.

**Present History:** History of vaginal discharge, Burning urination or dysuria or any other complaints, Time since rupture of membranes, Time of onset of labour, duration of rupture of membranes to delivery,

**Laboratory Findings:** presence and number of pus cells in urine, result of Urine culture and Endocervical swab culture and the type of Causative organisms isolated.

**3. Results**

90 pregnant women (30- Preterm, 30- PROM, 30- PPRM) were included in the current study.

**(Mean) Age:**

The mean age is 23.8 years. Age ranged from 20 to 35 years

**Socio Economic Status:** Out of 90 patients, 58% of patients belonged to SES IV, 31% belonged to SES III and 11% belonged to SESV Lower status

**Duration of PROM (Hrs):**

The mean duration of PROM is 2.84 hours. Duration of PROM ranged from 0hrs to 24 hrs.

**ROM to delivery interval (hrs.):**

The mean ROM to delivery time ranged from 0hrs to 28hrs. The ROM duration to delivery is 6.02 hours.

**Table 2: Socio Economic Status**

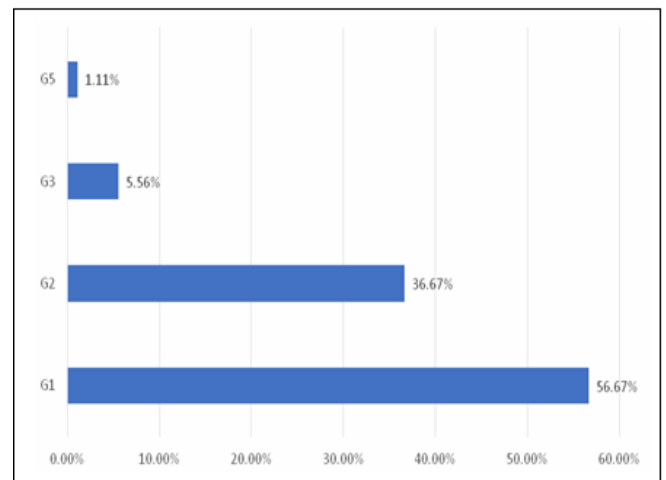
Economic Status (Class)	Frequency	Percent	Cum. Percent
III	28	31.11%	31.11%
IV	52	57.78%	88.89%
V	10	11.11%	100.00%
Total	90	100.00%	100.00%

**Obstetric formula:**

56% women belonged to G1; 36.67% women belonged to G2. Most of the women were primigravida

**Table 3: Obstetric formula**

Obstetric Formula	Frequency	Percent	Cum. Percent
G1	51	56.67%	56.67%
G2	33	36.67%	93.33%
G3	5	5.56%	98.89%
G5	1	1.11%	100.00%
Total	90	100.00%	100.00%



**Graph 2: Obstetric formula**

**Gestational age**

Most of the women belonged to gestational age 31 to 36 weeks.

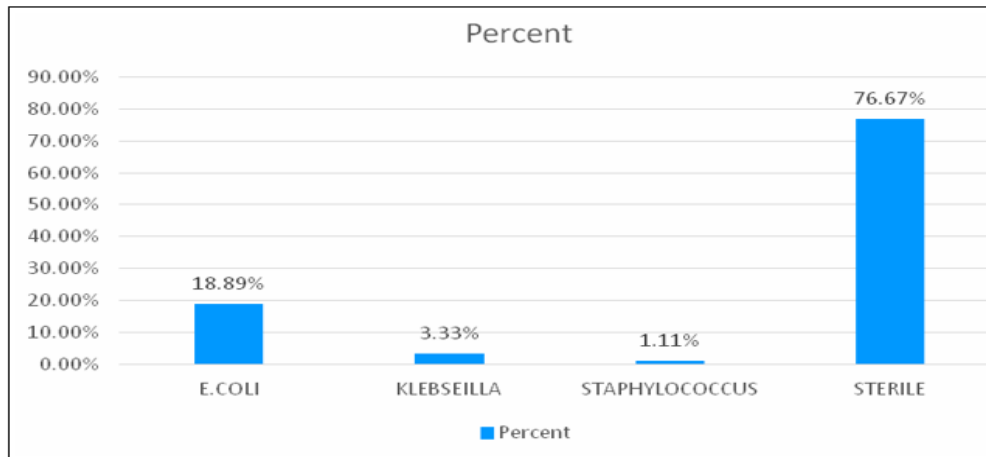
**Table 5: Gestational age**

Gestational Age (in weeks)	Frequency	Percent	Cum. Percent
26 to 30	7	7.78%	7.78%
31 to 36	53	58.89%	66.67%
Above 36	30	33.33%	100.00%
Total	90	100.00%	100.00%

**Urine Culture and Sensitivity:** 77% of the women had sterile in C/S report and 19% of the women were having E.coli in Urine C/S. E coli was the commonest isolated bacteria. Others seen include klebsiella and staphylococcus.

**Table 13: Urine C/S**

C/S	Frequency	Percent	Cum. Percent
E.COLI	17	18.89%	18.89%
KLEBSEILLA	3	3.33%	22.22%
STAPHYLOCOCCUS	1	1.11%	23.33%
STERILE	69	76.67%	100.00%
Total	90	100.00%	100.00%

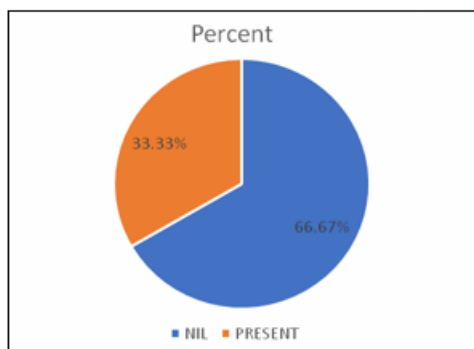


Graph 10: Urine C/S

1<sup>ST</sup> Trimester Urine Bacteria

Table 11: 1<sup>st</sup> Trimester urine bacteria

Trimester Urine Bacteria	Frequency	Percent	Cum. Percent
NIL	60	66.67%	66.67%
Present	30	33.33%	100.00%
Total	90	100.00%	100.00%



Graph 8: 1<sup>st</sup> Trimester urine bacteria

**Age and Urine C/S:** There was significant association between mean age and presence of bacterium and its type in urine, as per ANOVA analysis (p=0.00).

Table 11: Age and Urine c/s

Age and urine C/S					
Bacterium	Obs	Total	Mean	Variance	Std Dev
E.COLI	17.0000	408.0000	24.0000	11.7500	3.4278
KLEBSEILLA	3.0000	64.0000	21.3333	2.3333	1.5275
STAPHYLOCOCCUS	1.0000	28.0000	28.0000	NaN	NaN
STERILE	69.0000	1644.0000	23.8261	13.8517	3.7218

P Value – 0.00000

**Age and Vaginal C/S:** There was significant association between mean age and presence of bacterium and its type in vagina, as per ANOVA analysis (p=0.00).

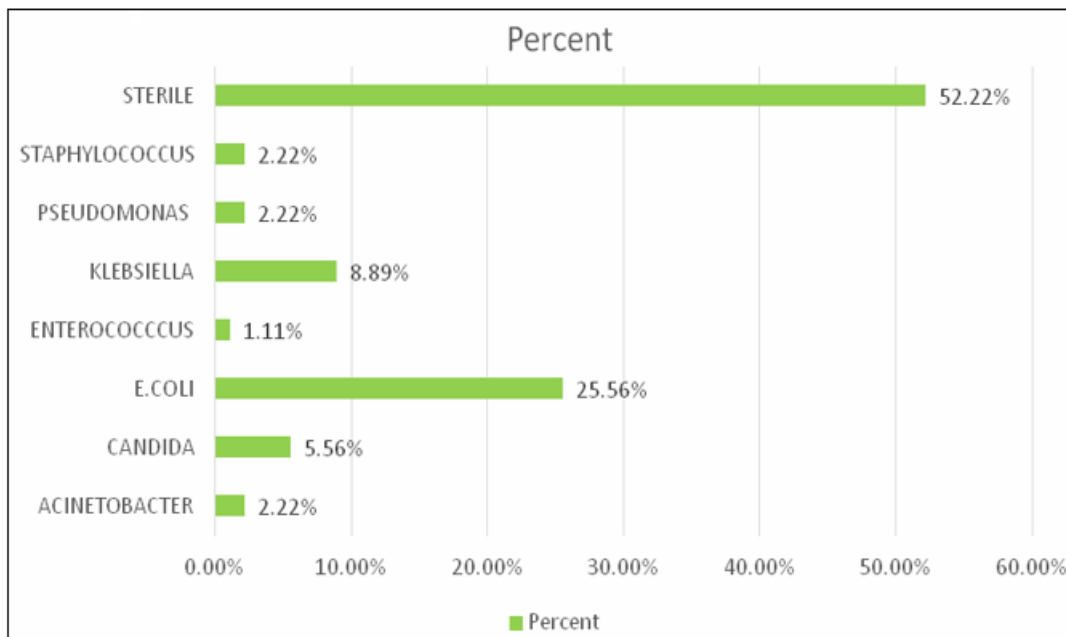
AGE AND VAGINAL C/S					
Type of bacterium	Obs	Total	Mean	Variance	Std Dev
ACINETOBACTER	2.0000	43.0000	21.5000	0.5000	0.7071
CANDIDA	5.0000	130.0000	26.0000	6.5000	2.5495
E.COLI	24.0000	548.0000	23.8261	11.6047	3.4066
ENTEROCOCCUS	1.0000	30.0000	30.0000	NaN	NaN
KLEBSIELLA	9.0000	206.0000	22.8889	4.1111	2.0276
PSEUDOMONAS	2.0000	20.0000	20.0000	NaN	NaN
STAPHYLOCOCCUS	3.0000	74.0000	24.6667	12.3333	3.5119
STERILE	44.0000	1051.0000	23.8864	16.7077	4.0875

**Endocervical C/S:**

No bacteria were seen in 52% women. and 26% of the women were having E. coli in endocervical C/S report

**Table 15:** Endocervical C/S

Endocervical C/S	Frequency	Percent	Cum. Percent
ACINETO BACTER	2	2.22%	2.22%
CANDIDA	5	5.56%	7.78%
E.COLI	23	25.56%	33.33%
ENTEROCOCCUS	1	1.11%	34.44%
KLEBSIELLA	8	8.89%	43.33%
PSEUDOMONAS	2	2.22%	45.56%
STAPHYLOCOCCU S	2	2.22%	47.78%
STERILE	47	52.22%	100.00%
		100.00%	100.00%



**Graph 12:** Endocervical C/S findings

**Table 22:** Age and Vaginal C/S

**ANOVA**

Variation	SS	df	MS	F-Statistic
Between	113.36383	9	12.59598	
Within	NaN	80	NaN	NaN
Total	NaN	89		

P-value = 0.00000

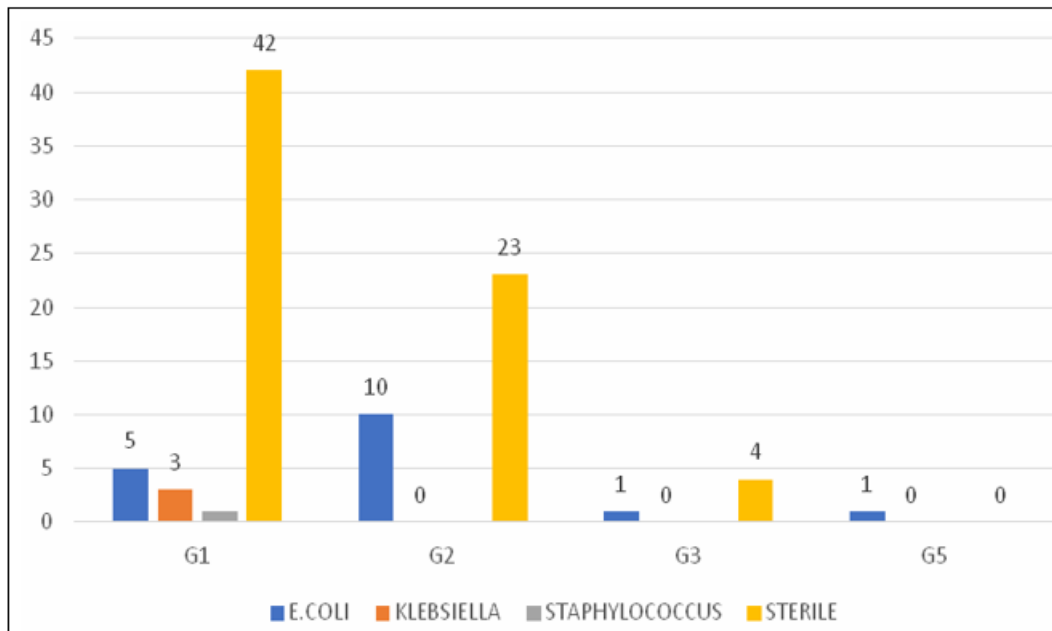
**Age and endocervical C/S:** There was significant association between mean age and presence of bacterium and its type in endocervix, as per ANOVA analysis (p=0.00).

AGE AND ENDOCERVICAL C/S					
Type of Bacterium	Obs	Total	Mean	Variance	Std Dev
ACINETOBACTER	2.0000	43.0000	21.5000	0.5000	0.7071
CANDIDA	5.0000	130.0000	26.0000	6.5000	2.5495
E.COLI	23.0000	548.0000	23.8261	11.6047	3.4066
ENTEROCOCCUS	1.0000	30.0000	30.0000	NaN	NaN
KLEBSIELLA	8.0000	185.0000	23.1250	4.1250	2.0310
PSEUDOMONAS	2.0000	41.0000	20.5000	0.5000	0.7071
STAPHYLOCOCCUS	2.0000	49.0000	24.5000	24.5000	4.9497
STERILE	47.0000	1118.0000	23.7872	15.9972	3.9997

**Parity and Urine C/S:** 42 G1 women’s urine was sterile, 23 G2 women’s and 4 G3 women’s was sterile

Table 24: Parity and vaginal C/S

URINE C/S					
Obstetric Formula	E. Coli	Klebsiella	Staphylococcus	Sterile	Total
G1	5	3	1	42	51
G2	10	0	0	23	33
G3	1	0	0	4	5
G5	1	0	0	0	1
TOTAL	17	3	1	69	90

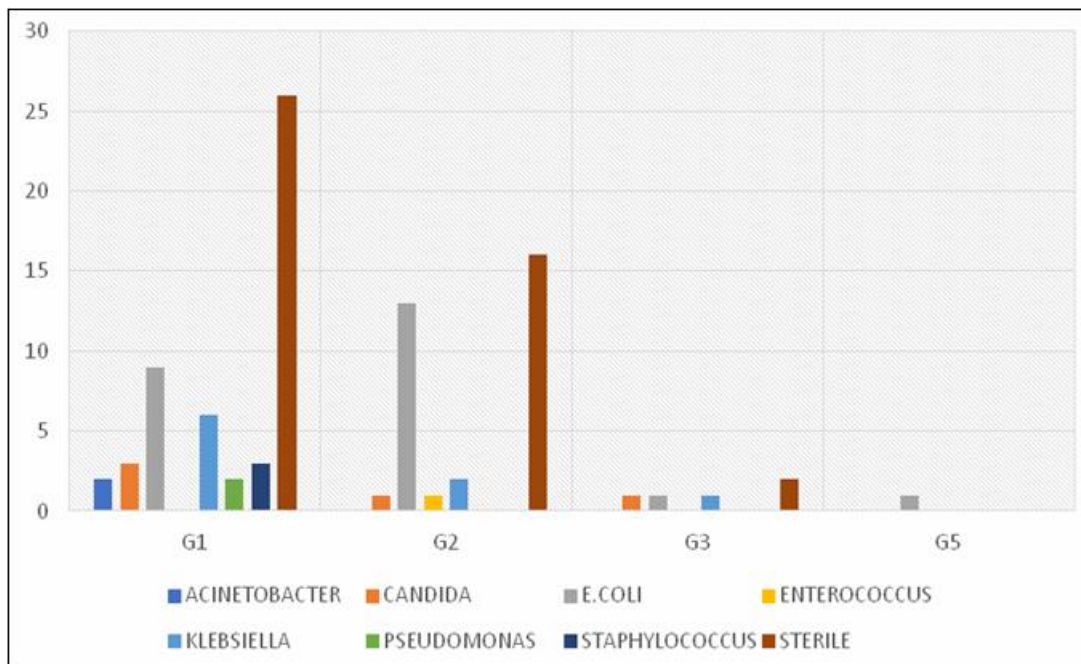


Graph17: Parity and urine C/S

Parity and Vaginal C/S: 26 G1 women’s vaginal swab was sterile, 16 G2 women’s and 2 G3 women’s vaginal swab were sterile.

Table 25: Parity and vaginal C/S

VAGINAL C/S									
Obstetric Formula 1	Acinetobacter	Candida	E.Coli	Enterococcus	Klebsiella	Pseudomonas	Staphylococcus	Sterile	Total
G1	2	3	9	0	6	2	3	26	51
G2	0	1	13	1	2	0	0	16	33
G3	0	1	1	0	1	0	0	2	5
G5	0	0	1	0	0	0	0	0	1
Total	2	5	24	1	9	1	3	44	90



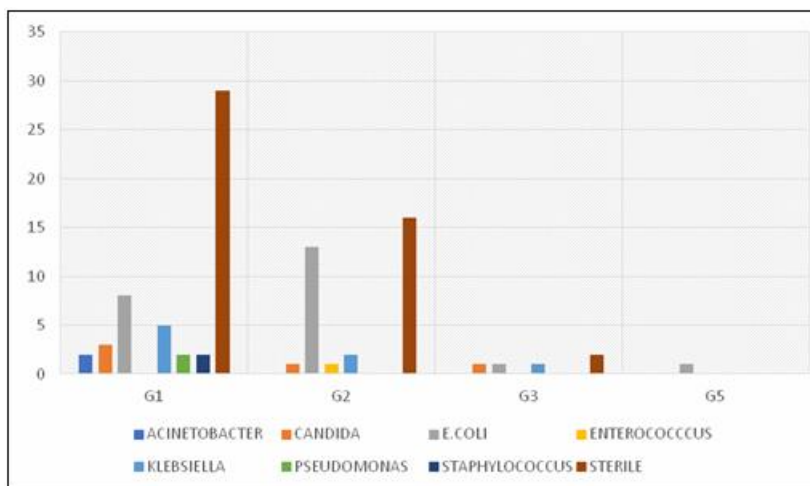
Graph 18: Parity and vaginal C/S

**Parity and Endocervical C/S**

29 G1 women’s endocervical swab was sterile, 16 G2 women’s and 2 G3 women’s endocervical swab were sterile

**Table 26: Parity and endocervical swab**

Obstetric Formula 1	ENDOCERVICAL C/S								Total
	Acinetobacter	Candida	E.Coli	Enterococcus	Klebsiella	Pseudomonas	Staphylococcus	Sterile	
G1	2	3	8	0	5	2	2	29	51
G2	0	1	13	1	2	0	0	16	33
G3	0	1	1	0	1	0	0	2	5
G5	0	0	1	0	0	0	0	0	1
TOTAL	2	5	23	1	8	2	2	47	90



Graph 18: Parity and endocervical swab

**4. Discussion & Summary**

- 300 pregnant women were included in the current study.
- The mean age is 23.8 years. Age ranged from 20 to 35 years. Out of 90 patients, 58% of patients belonged to SES IV, 31% belonged to SES III
- 56% women belonged to G1; 36.67% women belonged to G2.
- 68% of pregnant women don’t have any co-morbidities.
- Most of the women belonged to gestational age 31 to 36 weeks.
- The mean duration of PROM is 2.84. Duration of PROM ranged from 0 hrs. to 24 hrs.
- The mean ROM to delivery time is 6.02 hours.
- 1<sup>st</sup> trimester urine bacteria were seen in 33% patients taking the presence of >6 and above pus cells per HPF as significant bacteriuria.
- Bacteriuria was seen at the time of sample collection in 21.11% of women.

- 77% of the women had sterile C/S report and 19% of the women were having E.coli in UrineC/S
- No bacteria were seen in 48% of women in Vaginal swab C/S
- Endocervical C/S swab report revealed no bacteria in 52% of women and E.coli was isolated in 26% of women.
- There was significant association between mean age and presence of bacteria and its type in urine, vagina and endocervix as per ANOVA analysis(p=0.00).
- Urine cultures were sterile in 42 Primigravidas, 23 G2 women and 4 G3 women.
- Vaginal swab cultures were sterile in 26 Primigravidas, 16 G2 women and 2 G3.
- Endocervical swab cultures were sterile in 29 Primigravidas, 16 G2 women and 2 G3 women.

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## 5. Conclusion

Based upon the findings in this study it can be concluded that more than 50% of women's C/S reports (urine, vaginal, endocervical swabs) were not sterile indicating that UTI and genital infections do play a vital role in PROM, PPRM and Preterm deliveries. There was a significant association between women's age and presence of bacterium and type of bacterium seen. E Coli was the main organism seen in urine, vaginal and endocervical swabs. Early screening, prompt diagnosis and treatment for UTI and STI in pregnancy can help in the prevention of PROM, PPRM and Preterm labor. The study is self-sponsored. There were no conflicts of interest.

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