

## Antibiotic Susceptibility Pattern Of *E. Feacalis* Isolates From Uti Of Pregnant Women In Akola City

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### Abstract

The Urinary tract infection accounts for the majority of infection that an average women contract at least once during her life time. The risk of UTI is even greater in the pregnant women as it may lead to termination of pregnancy if not treated properly or if the drug given for treatment is harmful for the fetus. The major cause of UTI in patients is the uropathogens and *Enterococcus feacalis* is one of them causes serious infection. The significant percentage of cases i.e 33.2% were found to be affected with *Enterococcus feacalis*. The antibiotics viz. Fosfomycin, Norfloxacin, Ciprofloxacin etc are the important drugs for the treatment of UTI. The present study has been given more emphasis on isolation of *Enterococcus feacalis* as uropathogens and its susceptibility / resistant pattern against various antibiotics.

**Key Words:** UTI, *Enterococcus feacalis*, Antibiotics.

### Introduction

Urinary tract infection (UTI) is caused by bacteria that attach to the inside lining tissue of the urinary system or tract (1). Pregnant women have a greater risk of developing urinary tract infection. The organism *E. feacalis* account for 2% to 12% of infection (2).

A pregnant woman who develops UTI should be treated promptly to avoid premature delivery and other risks. Some antibiotics are not safe to take during pregnancy and therefore should be avoided (3). The most predominant of all uropathogens is *E. feacalis* which is a major cause of UTI.

Hence the study was undertaken to know the antibiotic resistance/ susceptibility pattern of *E. feacalis* isolates from UTI of pregnant women.

### Materials And Methods

The samples of urine collected from pregnant women suffering from UTI are immediately processed for detection of uropathogens, its identification and antibiotic susceptibility pattern.

The sample is centrifuged in sterilized tubes and the pellet is inoculated on UTI agar which is highly specific for majority of bacteria causing urinary Tract Infection. Also the pellet is simultaneously inoculated on MacConkey agar and EMB agar. All plates are incubated at 37° C for 24 hours. The *E. feacalis* is identified on the basis of the color of its colony and is accordingly separated on its specific media as well as nutrient media.

The *E. feacalis* is further identified on the basis of morphology, biochemical and specific cultural characteristics i.e growth on MacConkey agar, EMB agar.

### Antibiotic susceptibility testing was done by Kirby-Bauer Technique

**Media Used:** The media used was Mueller Hinton agar. The antibiotics used were Ampicilin, Amoxicilin, Gentamycin, Nitrofurantoin, Ciprofloxacin, Lomefloxacin, Norfloxacin, Ofloxacin, Trimethoprim, Sulphamethoxazole, Cephalexin, Cefuroxime, Cefactor, Cefpodoxime, Cephotaxime, Ceftriaxone, Penicillin, Cefepime, Fosfomycin, Virginamycin.

### Preparation of Inoculum:

UTI isolate (*E. feacalis*) was inoculated in 5ml sterile nutrient broth and incubated at 37°C for 2 to 8 hours till moderate turbidity developed. The inoculum turbidity was compared with by mixing 0.5ml of 1.175% Barium chloride and 99.5ml of 0.36N Sulphuric acid, as recommended by W.H.O. wherever necessary the inoculum was diluted or incubated further to attain comparative turbidity.

The *E. faecalis* isolates were then tested for their antibiotic resistance / susceptibility pattern by Kirby-Bauer technique (4), using the above antibiotics. The zone of inhibition was recorded after incubation at 37°C for 18 to 20 hours.

## Result And Discussion

Total numbers of cases of Urinary Tract Infection in pregnant women were 1121. The microbial analysis showed 373 cases being affected either only by *E. faecalis* or has mixed infection including *E. faecalis*. The titre value from each sample was determined and the significant samples (124) with the titre value above 10<sup>5</sup> were selected for further studies (Table 1, 2, 3). The significant percentage of cases i.e. 33.2% were found to be affected with *E. faecalis*. The isolate from the UTI affected patients was confirmed as *E. faecalis* based on its morphology, biochemical and cultural characteristics (Table 4).

The antibiotic susceptibility test is done in triplicate by Kirby-Bauer technique and the readings are recorded (Table 5). Total 20 Antibiotics were selected which were considered to be safe for pregnant women. Out of 20 antibiotics, *E. faecalis* isolates were found to be resistant to viz. Virginamycin, Lomefloxacin, Cefactor. The highest frequency of Antibiotic to which the isolate was sensitive is Amikacin which was positive in all 117 cases (i.e. 100%). However Vancomycin showed lowest frequency with only 04 positive cases.

The sensitivity of the *E. faecalis* isolate was compared with the standard *E. coli* ATCC 25922.

The most potent antibiotics were found to be Fosfomycin, Nitrofurantoin, Trimethoprim.

Thus the drug of choice for the Urinary Tract Infection caused by *E. faecalis* specially for the pregnant women is Fosfomycin, which is correlated with the same findings as Delzell and Lefevre (2).

Table 1: Screening of a total of 1121 patients for *E. faecalis*

<i>E. faecalis</i>	Frequency	Valid Percent	Cumulative Percent
- ve	748	66.7	66.7
+ ve	373	33.3	100.0
<b>Total no. of patients</b>	<b>1121</b>	<b>100.0</b>	

Table 2: Screening of 373 patients to check the percentage of patients that showed significant titre (more than 10<sup>5</sup>)

<i>E. faecalis</i>	Titre	Frequency	Valid Percent	Cumulative Percent
	10 <sup>1</sup>	56	15.0	15.0
	10 <sup>2</sup>	98	26.3	41.3
	10 <sup>3</sup>	46	12.3	53.6
	10 <sup>4</sup>	49	13.1	66.8
	<b>10<sup>5</sup></b>	<b>39</b>	<b>10.5</b>	<b>77.2</b>
	<b>10<sup>6</sup></b>	<b>41</b>	<b>11.0</b>	<b>88.2</b>
	<b>10<sup>7</sup></b>	<b>31</b>	<b>8.3</b>	<b>96.5</b>
	<b>10<sup>8</sup></b>	<b>13</b>	<b>3.5</b>	<b>100.0</b>
	Total	<b>373</b>	<b>100.0</b>	

Table 3: Percentage of samples that showed non-significant and significant titres from total +ve samples

	Non- significant (Percent)	Significant (Percent)
<i>E. faecalis</i>	<b>66.8</b>	<b>33.2</b>

Table 4: Morphology, Biochemical and Cultural Characters of *E. faecalis* Isolates

Morphology	Result
Gram Stain	Gram positive cocci
Motility	Non Motile
Biochemical Test	Result
Glucose	A+G
Lactose	A
Mannitol	A
Indole	-ve
M.R	+ve

V.P	-ve
Citrate	+ve
Urease	+ve
H <sub>2</sub> S production	-ve
Nitrate	-ve
Oxidase	-ve
<b>Cultural Characters</b>	<b>Result</b>
MacConkey Agar	Pink colored colonies
UTI Agar	Blue colored colonies

The above tests confirmed the isolate as *E. feacalis*.

**Table 5:** Antibiotic susceptibility test of *E. feacalis* isolate from UTI of pregnant women. *Enterococcus feacalis*  
(Total cases =124 )

Antibiotics (in µg )	No. of Sensitive cases	Mean ± SD		Range	Min	Max
Ampicilin (25 µg)	39	11	± 0.81	2	10	12
Amoxicilin (10 µg)	10	10	± 0.00	0	10	10
Gentamycin (10 µg)	15	11	± 1.13	4	10	14
Nitrofurantoin (50 µg)	75	13	± 2.12	6	10	16
Ciprofloxacin (10 µg)	16	11	± 0.81	2	10	12
Lomefloxacin (10 µg)	<b>Resistant</b>					
Norfloxacin (10 µg)	15	10	± 0.46	1	10	11
Ofloxacin (5 µg)	10	11	± 0.71	2	10	12
Trimethoprim (25 µg)	75	11	± 1.15	4	10	14
Sulphamethoxazole (50 µg)	51	11	± 1.34	5	10	15
Cephalexin (30 µg)	29	11	± 0.48	1	10	11
Cefuroxime (30 µg)	6	10	± 0.00	0	10	10
Cefactor (30 µg)	<b>Resistant</b>					
Cefpodoxime (30 µg)	12	10	± 0.39	1	10	11
Cephotaxime 30 µg)	<b>Resistant</b>					
Ceftriaxone (30 µg)	18	11	± 0.92	2	10	12
Penicillin (10 unit)	12	10	± 0.79	2	10	12
Cefepime (30 µg)	12	10	± 0.45	1	10	11
Fosfomycin (200 µg)	74	12	± 1.55	6	10	16
Virginamycin (15 µg)	<b>Resistant</b>					

## References

- 1) Anonymus, Urinary Tract Infections (UTI), "Sexually Transmitted Disease Resource", 2003.
- 2) John E. Delzell and Michael L. Lefevre, "Urinary Tract Infection during Pregnancy", American Academy of family physicians, February 1, 2000.
- 3) National Kidney and Urologic Diseases Information Clearinghouse, NIDDK, "Urinary Tract Infetions in Adults", NIH publication No. 04-2097, November 2003.
- 4) Bauer A. W., Kirby W. M. and Sherris J. C., Am. J. Clin. Pathol., 1966, 45:493