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Urinary Tract Infection in Pregnancy

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ABSTRACT
The present study was undertaken to resolve the prevalence of UTI (Urinary Tract Infection) In pregnancy and to study the common organism involved in UTI infection and their antibiotic susceptibility pattern.
Key words:
Urinary Tract Infection in Pregnancy
Subjects:
150 pregnant women between 18 to 45 years of age.
Methods:
A total 150 pregnant women who were aged between 18 to 45 were selected for the study. Midstream urine was collected following the usual laboratory protocol and immediately processed in the laboratory. Routine urinary microscopy and urine culture was done in all cases.

I. INTRODUCTION

Definition:
The condition in which bacteria are established and multiplied within the urinary tract is called urinary tract infection.
Urinary tract infection is common in pregnancy needs to be studied because it was potentially lethal and also preventable. An understanding of the predisposing factors and their prevention will help reduce the morbidity and mortality from the disease.
In recent year bacteriuria of the maternity has drawn attention of obstetricians everywhere the planet owing to its effects on the mother and foetus. Several factors increase the chance of UTI in gestation. These factors embrace relative obstruction of the ureters, sleek muscle relaxation of the canal and bladder, and symptom, which give a positive setting for the expansion of the microorganism. E.coli was the most typical organism isolated from the cultures, Proteus Mirabilis and Klebsiella Pneumonia are also observed.Less common agents embrace group B Streptococci and staphylococcus saprophyticus.(53)
Up to 70% of pregnant women develop glycosuria, which encourages bacterial growth in urine. In urinary the lower urinary tract to resist invading bacteria. This decreased ability may be allowing some strains of bacteria to selectively grow. These factors may all contribute to the development of UTIs during pregnancy. (36)
Acute pyelonephritis throughout maternity may be a serious general ill health that may accomplish maternal infection, labor and premature delivery. The maternal and infant complication of a UTIs throughout maternity are often devasting. 30% of patients with untreated well bacteriuria develops symptomatic urinary tract infection and up to 50% develop urinary tract infection. (26)

II. MATERIALS AND METHODOLOGY

Source of data:
This study includes 150 pregnant women from Soni Laboratory, Vadodara.
Method of collection of data:
Study design:
The study design selected in the study is single blinded study, in which the patients, who given the sample for the study, does not know any information about the study.
Sample design:
Sample design was the method of drawing a representative part of the population from the whole population.
In the study the sample style selected was random sampling.
A sample selected after giving equal independent chances of selection to each and every item of the population was called Random sampling. (62)
Sample Size:
150 Pregnant women who were aged between 18-45 were selected for the study.
Materials needed for the study:
Sterile specimen instrumentation
Calibrated wire loop
Sterile cover slips for wet mount
Gram's stain

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Culture media- MacConkey agar, medium, Blood agar
Colony counter
Biochemical check media
Antibiotics for sensitivity test

METHODOLOGY:

Sample: - Midstream urine sample:
Method of collection of midstream Sample:
Urine sample was most commonly collected by obtaining the midstream flow by the clean-catch technique. Urine collection from the women by this method requires personal supervision for the best result. Once cleaning was completed, allow the first few drops of urine passed into a toilet bowl to flush out bacteria from the urethra.
Midstream samples were collected in a sterile container following the usual laboratory protocol and immediately sent for the culture and sensitivity.
Wet Mount:- wet mount was done to assess PMNLs (polymorphonuclear Leucocytes), RBC & microorganisms, crystals, casts etc.(centrifuged urine was for wet mount).
Urine culture:
The clean catch midstream urine was inoculated into nutrient agar, medium and MacConkey agar plates with a 0.01ml calibrated loop.

III. INOCULATION AND INCUBATION OF URINE CULTURE:

Urine was mixed thoroughly, and lid of the container is the removed. The sterilized calibrated loop is inserted vertically into the urine in the container.
Spread a loopful of urine over the surface of the media. Without or reentering urine, loop was drawn across the entire plate, crossing the first inoculums streak numerous times to produce isolated colonies.
Incubated plates for twenty-four hours at thirty-seven C. Colonies area unit counted on every plate. The No. of CFUs is increased by a thousand (if a 0.001 mil loop was used) or by a hundred (if 0.01 mil loop was used) to see the quantity of microorganisms per cc within the origin specimen. On culture of center sample of piss, a, colony count of over 105/ml organisms of one species was thought-about vital.
Samples showing insignificant growth, mixed growth of 2 or additional pathogens or growth of non-pathogens weren't thought about as culture positive. the subsequent definitions were utilized within the gift study.
Positive culture:
A positive urine culture was defined as growth of > 10^5 colonies of a single urinary tract pathogen/ml of specimen in a midstream of urine.
Biochemical tests:
Organisms that are alike in morphology and in cultural characteristics are often differentiated by their reactions in various biochemical tests.
Antibiotic sensitivity test:
Antibiotic sensitivity test was done to identify the antibiotics for which the organisms was susceptible and for which it was resistant. With the increase in the emergence or drug resistance of organisms, it should be performed compulsory before prescription of antibiotic therapy.
Antibiotic sensitivity test done by Kirby-Bauer method.
Requirement of antibiotic susceptibility testing:

- Antibiotic discs
- Mueller Hinton agar
- Broth- Nutrient broth isolated organisms

The method used for the test was Kirby-Bauer disc diffusion method. In this method, filter paper discs impregnated with antibiotics of known concentration are used.
Antibiotics used were Ampicillin, Cotrimoxazole, Nalidixic acid, Norfloxacin, Nitrofurantoin, Amikacin, Gentamycin, Ciprofloxacin, Ceftriaxone.
Steps:
Prepare Mueller Hinton Agar plates, the medium within the plates ought to be sterile and have a depth of concerning 4mm.

A broth culture of the isolated organisms was created victimization nutrient broth. A colony of the isolated organisms was inoculated into the nutrient broth so incubated at 37 C for concerning 18-24 hours, until the turbidness matches with McFarland zero.5 standard.

Dip a sterile non-toxic cotton swab on a wood applier into the standardized matter and rotate the soaked swab firmly against the higher within wall of the tube to precise excess fluid.

Streak the whole surface of the plate with the swab thrice, turning the plates at sixty angles between every streaking. permit the matter to dry for 5-15 min. With lid within the place.

Apply the antibiotic discs on the plate employing a sterile extractor. Discs ought to be in a very distance of 9mm from the sting of the plate and a minimum of 24mm excluding one another.

Incubate the plate at thirty-seven C for 18-24 hours. once the long incubation, live the diameter of zone of inhibition round the discs employing a scale. every zone was taken as

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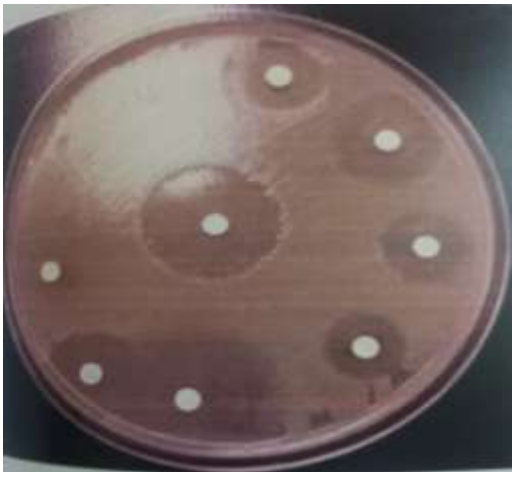
resistant, moderately sensitive or sensitive with relevance the Kirby-Bauer chart.



IV. OBSEVATIONS AND RESULTS

Incidence:

A total of 150 urine samples were sent for microscopic examination and culture.

In 50 cases the urine culture was positive, giving an incidence of 33.3% in this study.

Distribution of patients according to incidence of UTI in pregnancy.

Prevalence of UTI in pregnancy is about 33.3%.

TABLE NO 1- Showing prevalence of UTI in pregnancy

Total number of pregnancy cases	Patients with UTI in pregnancy	Percentage
150	50	33.3%

CHART NO 1- Showing prevalence of UTI in pregnancy

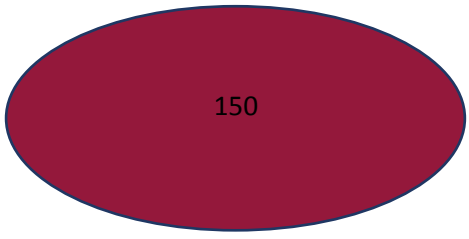


TABLE NO 2- Showing percentage of antibiotic susceptibility in general.

Antibiotic Used	Percentage of Susceptibility
Ampicillin	68 %
Cotrimoxazole	72%

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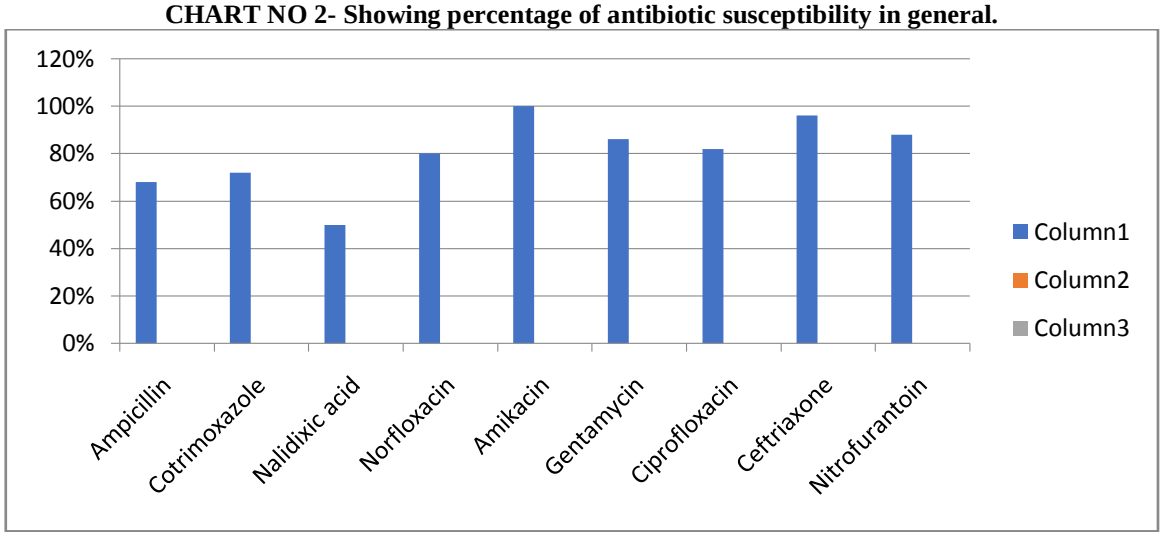
Nalidixic acid	50 %
Norfloxacin	80 %
Amikacin	100 %
Gentamycin	86 %
Ciprofloxacin	82 %
Ceftriaxone	96 %
Nitrofurantoin	88 %

CHART NO 2- Showing percentage of antibiotic susceptibility in general.



V. DISCUSSION

Urinary tract infection was one of the common infections during pregnancy. The intent of present study was to determine the prevalence of UTI in pregnancy and to study the common organisms involved in UTI and their antibiotic sensitivity pattern.

The incidence of UTI in pregnant women varies among different studies. The result shows that the incidence rate of UTI in pregnancy was 33.3 %.

In that study the organism frequently isolated in UTI in pregnancy include species of Enterobacteriaceae especially E.coli and other gram-negative bacteria. In a study conducted by Grace B Turner shows that commonest organisms isolated in pregnancy was E.coli 87.4 %. The findings of the study was similar with the study conducted by Grace B Turner.

In the present study E.coli isolates were highly resistant to Nalidixic acid and Ampicillin while Amikacin and Ceftriaxone are susceptible. A study conducted shows that, the majority of E.coli isolates were resistant to gentamycin, Ampicillin and tetracycline while 75% to 100% of E.coli isolates were susceptible to Ciprofloxacin, Ceftizoxime and Amikacin.

A total of 150 Pregnant women were included in the study. In this study out of 150 pregnant cases 50 patients showed significant bacterial growth making an overall prevalence of 33.3%.

It was found that most common etiological agent causing urinary tract infection in pregnancy was E.coli (68%) followed by Klebsiella (20%), Citrobacter (6%) and proteus(6%).

Urinary tract infection are common complications of pregnancy. Therefore, proper screening and treatment of Urinary tract infections during pregnancy is necessary to prevent complications. All pregnant women should therefore be screened for the presence of

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bacteriuria, which if detected should be treated with an antimicrobial agent believed to safe for use in pregnancy.

VI. CONCLUSION:

This study has shown that the prevalence of urinary tract infection during pregnancy is 33.3% and E.coli is the most common causative agents of UTI in pregnancy.

The antibiotic susceptibility pattern of the isolated organisms showed that Amikacin was the most effective antibiotic followed by Ceftriaxone while Nalidixic acid was the most resistant antibiotic followed by Ampicillin.

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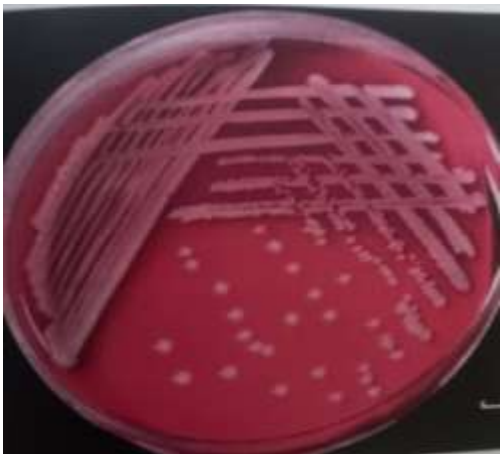
Anexure

1. E. coli colonies on blood agar.



Mater Chart:

R – Resistant, S –Sensitive

Notes: Sensitivity and resistant is based on levels of antibiotics achieved in the serum of people with normal kidney and liver function. Drugs concentrated in urine may be effective for urinary tract infection even when testing shows them resistant.

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Sensitive – Implies that an infection due to the strain may be treated with the recommended dosage unless otherwise contraindicated.
Resistant – Strains falling in this category are not inhibited by the usually achievable systemic concentrations of the agent with normal dosage schedules.

Sr.No	Hosp.Id.N	Age	Turbidity	Organism	A	BA	NA	NX	F300	AK	J	CL5	CC
1	HC8385	21	ST	E.coli	S	S	R	s	S	S	S	S	S
2	HC7864	29	ST	E.coli	S	S	S	S	S	S	S	S	S
3	HC9045	29	T	E.coli	S	R	R	S	S	S	R	R	S
4	HC7356	20	T	Klebsiella	R	S	S	S	R	S	S	S	S
5	HC9540	25	T	E.coli	S	R	R	S	S	S	S	R	S
6	HC6936	31	T	Klebsiella	S	S	R	S	S	S	S	S	S
7	HC8410	20	T	E.coli	R	S	R	S	S	S	S	S	S
8	HC0547	25	ST	E.coli	S	S	R	S	S	S	S	S	S
9	HC0548	28	T	Citrobacter	S	S	R	S	S	S	S	S	S
10	HC8460	24	T	E.coli	S	S	S	S	S	S	S	S	S
11	HC6947	25	T	E.coli	S	S	S	S	S	S	S	R	S
12	HC8680	21	ST	E.coli	S	S	R	S	S	S	S	S	S
13	HC8540	26	T	Klebsiella	S	R	S	S	S	S	S	S	S
14	HC9213	25	T	E.coli	S	R	S	R	S	S	S	S	S
15	HC1267	30	T	E.coli	R	R	R	R	R	S	R	S	R
16	HC5090	25	CL	E.coli	R	S	S	S	S	S	S	S	S
17	HC1000	32	T	Citrobacter	R	R	R	S	R	S	R	S	R
18	HC8593	33	T	E.coli	S	S	R	S	S	S	S	S	S
19	HC8539	24	CL	Klebsiella	S	S	S	S	S	S	S	S	S
20	HC6857	34	ST	E.coli	R	R	S	S	S	S	S	R	S
21	HC6597	28	T	Proteus	R	R	R	R	R	S	R	S	S
22	HC9866	28	T	E.coli	S	R	S	R	S	S	S	S	S
23	HC0687	28	ST	E.coli	R	S	S	R	S	S	R	S	S
24	HC0001	26	T	E.coli	S	S	S	R	S	S	S	S	S
25	HC0376	19	ST	Citrobacter	S	S	S	S	S	S	S	S	S
26	HC6835	24	T	Proteus	S	S	S	S	S	S	S	S	S
27	HC0043	33	CL	E.coli	R	S	S	S	S	S	S	S	S
28	HC0563	23	T	E.coli	R	S	R	S	S	S	S	S	S
29	HC0954	30	T	Klebsiella	R	S	S	S	R	S	S	R	R
30	HC0780	28	ST	E.coli	S	S	R	S	S	S	S	S	S
31	HC6745	21	T	E.coli	S	S	R	S	S	S	S	S	S
32	HC0989	23	T	Klebsiella	S	S	S	R	S	S	S	S	S
33	HC0905	27	T	E.coli	S	R	S	S	S	S	R	S	S
34	HC0080	21	T	E.coli	S	S	S	S	S	S	S	S	S
35	HC0006	24	T	E.coli	S	R	S	R	S	S	S	S	S
36	HC1149	22	T	Klebsiella	S	S	R	S	S	S	S	S	S
37	HC4995	28	T	E.coli	S	S	R	R	S	S	S	S	S
38	HC9867	25	T	E.coli	S	S	R	S	S	S	S	S	S
39	HC2314	23	T	E.coli	R	S	R	S	S	S	S	S	S
40	HC0054	34	T	E.coli	R	R	R	S	S	S	S	S	S
41	HC0707	32	ST	Klebsiella	R	R	R	S	R	S	R	R	S
42	HC5060	29	T	E.coli	R	S	S	S	S	S	S	S	S
43	HC0005	19	T	E.coli	S	R	S	S	S	S	S	R	S
44	HC0053	30	ST	Klebsiella	S	S	S	S	R	S	S	S	S
45	HC0054	22	T	E.coli	S	S	S	S	S	S	S	S	S
46	HC0043	24	T	E.coli	S	S	S	S	S	S	S	R	S
47	HC0065	28	T	Klebsiella	S	S	R	S	S	S	S	S	S
48	HC0034	33	T	Proteus	S	S	R	S	S	S	S	S	S
49	HC0003	20	T	E.coli	R	S	R	S	S	S	S	S	S
50	HC9850	33	ST	E.coli	S	S	R	S	S	S	S	S	S