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A Bacteriological Study of Urinary Tract Infections (U.T.I.) For Diagnosis of Significant Bacteriuria

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ABSTRACT

Background: Urinary Tract Infection is an infection localized in the urinary tract. Acute community acquired UTI are very common. UTI is also the most common cause of nosocomial infections. The present study is therefore being undertaken to evaluate the bacteriological profile of urinary tract infections using cultural analysis with antimicrobial susceptibility testing and to determine the age-gender distribution, socio-demographic variables and risk factors predisposing the patients to UTI. **Methods:** The study was undertaken in the Department of Microbiology, Goa Medical College on 200 urine samples that were collected randomly from patients, attending the Out Patient Department. Urine samples were collected from patients with a provisional diagnosis of urinary tract infections, based on clinical history alone. The patient was asked a detailed personal history. Further each sample was processed with Semi quantitative culture and antimicrobial sensitivity testing. Risk factors were evaluated from the study. **Results:** 200 samples processed by semi-quantitative loop method, out of which significant bacteriuria was observed in 62% cases. Cases belonging to the age group 21-30 years and females were significantly more affected; Majority of the subjects were married (85%), Housewives (47.5%) and belonging to lower socioeconomic status (51.5%). Pregnancy, as a risk factor predisposing to UTI was seen in a large number of subjects (62%). In the study isolation of gram negative bacilli were to the tune of 79.1% ;majority being Escherichia coli (34.3%). while Gram positive cocci were 20.9% commonest being group D streptococcus (20.9%). **Conclusion:** The above study evaluated that majority of subjects susceptible are married females belonging to lower class. Pregnancy and Diabetes mellitus are the commonest predisposing factors. Culture analysis by semi-quantitative loop method showed Significant bacteriuria in 62% cases. Commonest etiological bacterial pathogen was Escherichia coli followed by Klebsiella pneumoniae and Group D Streptococcus.

Keywords: Urinary Tract Infection, Risk Factors, Cultural Analysis, Bacteriology, Antibiotic Sensitivity.

INTRODUCTION

Urinary Tract Infection is an infection localized in the urinary tract. Bacteriuria is the presence of microorganisms in the urine; irrespective of symptoms.[1] Acute infections could be lower tract infections (urethritis or cystitis) and upper tract infections (pyelonephritis or prostatitis). Fever, dysuria, frequency, urgency and suprapubic pain are common symptoms. Acute community acquired UTI are very common. UTI is also the most common cause of nosocomial infections.[2]

All individuals are susceptible to UTI, but the prevalence depends on age, gender and certain predisposing factors. The infections may range from asymptomatic infection to simple acute symptomatic infection with a susceptible organism to a more serious recurring infection such as pyelonephritis which may be caused by resistant and often difficult to treat organisms.

From a microbiological perspective, UTI exists when pathogenic microorganisms are detected in the urine. In most instances, growth of more than or equal to 105 organisms per ml from a properly collected midstream clean catch urine sample indicates infection. However, in symptomatic patients or in patients with an indwelling catheter, fewer bacteria (102-104org/ml) may signify infection. Conversely, colony count of >105/ml in midstream urine are occasionally due to specimen contamination, which is likely when multiple bacterial species are found.[3]

Determination of the number and type of bacteria in the urine are extremely important diagnostic procedures. Urine culture and antimicrobial

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susceptibility testing should be performed for any patient with suspected UTI.

The present study is therefore being undertaken to evaluate the bacteriological profile of urinary tract infections, using cultural analysis.

Socio-demographic variables and risk factors predisposing the patients to urinary tract infection were studied. Finally relevant information drawn from this study was compared with those of other workers, both within and outside our country.

MATERIALS AND METHODS

The study was undertaken in the Department of Microbiology, Goa Medical College. The material for the study included two hundred samples that were collected randomly from patients, attending the Out Patient Department of this institution. Urine samples were collected from patients with a provisional diagnosis of urinary tract infections, based on clinical history alone. Only those patients who have not received any antimicrobial treatment were included in the study. A detailed information was obtained with regard to the following: i)Age ii)Gender iii)Marital status iv)Occupation and v)Socio-economic status. A detailed history was obtained from the patients on the following lines: i)Sexual habits ii)Pregnancy in female subjects iii)Evidence of diabetes mellitus iv)History suggestive of obstruction v)Benign enlargement of prostate (BEP) vi) Calculi vii) Neoplasms viii) History of instrumentation and catheterization.

Every subject was asked to collect early mid-stream clean catch urine in a sterile container. The males were instructed to collect urine after retracting prepuce and the glans penis cleaned with soap and water. The women were instructed to collect urine after careful anogenital toilet with soap and water, while separating the labia by the fingers. The samples were refrigerated in case of delay of more than 1-2 hours for transportation of the samples.

Semi quantitative culture was performed by using a calibrated bacteriological loop streak plate method. A platinum loop with a diameter of 1.45 mm calibrated to deliver 0.001 ml of urine was used. One loopful of well mixed uncentrifuged urine was inoculated on blood agar and MacConkey agar. It was then streaked on MacConkey agar plate employing an inverted cone technique.[4] The streaking on blood agar plate employed was using primary, secondary and tertiary streak. After overnight incubation at 37°C, colony count was done and significant bacteriuria was reported at a count of ≥105 CFU/ml. Growth on the plates were processed according to standard microbiological techniques.[5] Antibiotic sensitivity was done by standard disc diffusion method of Kirby Bauer. The antibiotic discs were selected based on the isolate.

RESULTS

The prospective study included a bacteriological analysis of 200 clean catch early morning midstream, randomly selected urine samples from patients with clinical suspicion of urinary tract infection. The study was carried out over a period of 6 months from January to June 2019.

Table 1: Age and Gender Distribution Of Subjects Under Study

Age group in years	Female	Male	No. of cases
0-10	3 (50)	3 (50)	6 (3)
11-20	12 (80)	3 (20)	15 (7.5)
21-30	75 (92.6)	6 (7.4)	81 (40.5)
31-40	35 (92.1)	3 (7.9)	38 (19)
41-50	13 (68.4)	6 (31.6)	19 (9.5)
>50	22 (53.7)	19 (46.3)	41 (20.5)
Total	160 (80)	40 (20)	200 (100)

N. B. Figures in parenthesis indicate percentage

Male to female ratio is 0.25:1

From the above [Table 1], it is evident that a large number of cases belonged to the age group 21-30 years (n=81; 40.5%), followed by individuals in the age group of more than 50 years (n=41; 20.5%) and 31 to 40 years (n=38; 19%). Children and adolescents accounted for a low number i.e. 3% and 7.5% respectively. Females were significantly more affected than males; the male to female ratio being 0.25:1. In most age groups, female patients predominated. However in the age group 0-10 years, equal numbers of male and female cases were encountered. In the age group >50 years, although females were more in number (n=22; 53.7%), the difference was not statistically significant.

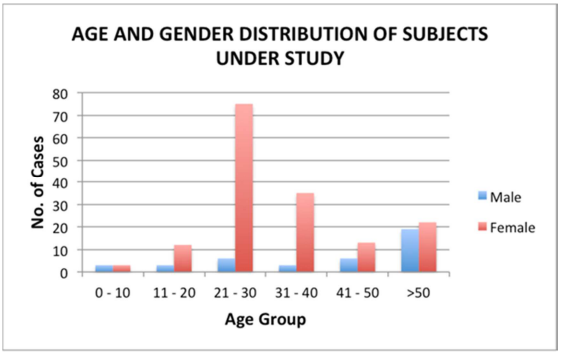


Table 2: Marital Status of the Subjects Under Study

Gender	Married	Unmarried	Total
Male	33 (19.4)	7 (23.3)	40 (20)
Female	137 (80.6)	23 (76.7)	160 (80)
Total	170 (85)	30 (15)	200 (100)

N.B. Figures in parenthesis indicate percentage

Majority of the subjects were married, i.e. 170 out of 200 (85%), as is evident in Table No. 2. In both the married and unmarried categories; female patients predominated (80.6% and 76.7% respectively).

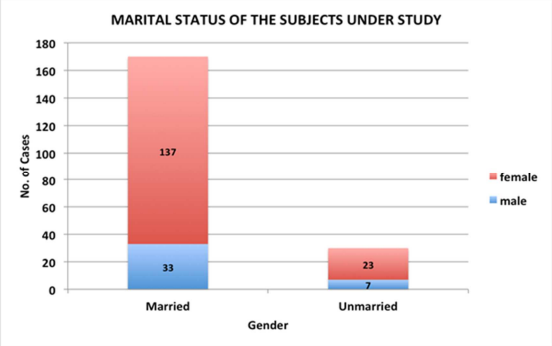


Table 3: Occupation of the Study Subjects

Occupational group	No. of cases	Percentage
Business	12	6
Professionals	11	5.5
Skilled	18	9
Unskilled	20	10
Agriculture	12	6
Housewives	95	47.5
Unemployed	32	16
Total	200	100

[Table 3] depicts the occupation of the study subjects with suspected UTI. Housewives accounted for 47.5% of the total, followed by unemployed individuals (16%) and unskilled personnel (10%). Subjects dealing with business, agricultural work and professionals accounted for 6%, 6% and 5.5% respectively.

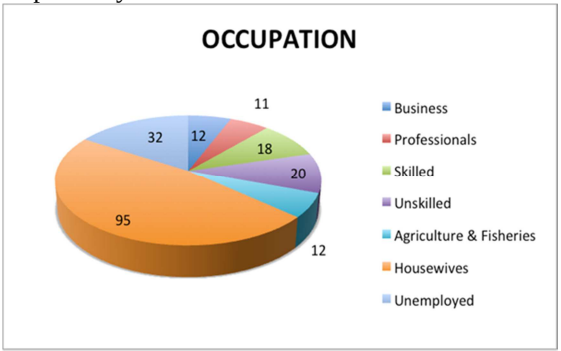


Table 4: Socioeconomic Status Of The Subjects

No. of cases	Lower	Upper Lower	Lower Middle	Upper Middle	Upper
200	0	103 (51.5)	48 (24)	40 (20)	9 (4.5)

N.B. Figures in parenthesis indicate percentage

Subjects belonging to lower class were 51.5% (103/200), while individuals belonging to middle class were 44%, upper middle being 20% and lower middle being 24%. Only 4.5% subjects belonged to the upper socioeconomic strata.

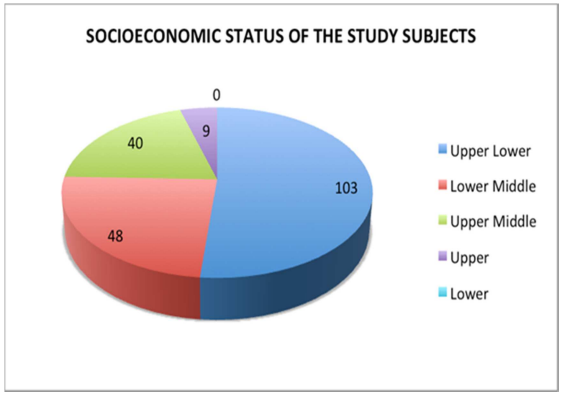


Table 5: Risk Factors Associated With Urinary Tract Infection (N=200)

Sr. No	Risk factor	No. giving positive history	Percentage %
1	Increased sexual activity	-	-
2	Pregnancy	124	62
3	Diabetes mellitus	40	20
4	B.E.P.	2	1
5	Calculi	11	5.5
6	Strictures	0	0
7	Neoplasms	5	2.5
8	H/o instrumentation	15	7.5
9	Catheterisation	3	1.5
10	No specific risk factor	5	2.4

[Table 5] depicts various risk factors associated with UTI among the study subjects. Pregnancy, as a risk factor predisposing to UTI was seen in a large number of subjects i.e. 124 out of 200 (62%). Diabetes mellitus was identified in 19.5% cases, while history of instrumentation and presence of calculi was seen in 7.4% and 5.4% respectively.

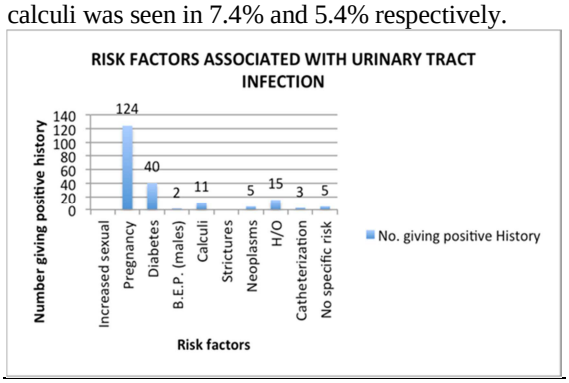


Table 6: Culture results of 200 samples by semiquantitative loop method

A) Interpretation of results

Culture result	No. of samples	Percentage
Significant bacteriuria	124	62
Doubtful Bacteriuria	3	01.5
Growth of contaminants	41	20.5
No growth	32	16
Total	200	100

B) Culture Findings In Significant Bacteriuria Cases (n=124)

Organisms Isolated n=124						
Monomicrobial			**Polymicrobial**			
Gram Negative	**Gram Positive**	**Total**	**Gram Neg+ Gram Neg**	**Gram Pos+ Gram Neg**	**Gram Pos+ Gram Pos**	**Total**
86 (75.4)	28 (24.6)	114 (91.9)	10 (100)	0	0	10 (81)

N.B. Figures in parenthesis indicate percentage

[Table 6] depicts the culture result of the study samples by semi-quantitative loop method. Out of 200 samples processed, significant bacteriuria was observed in 124 cases i.e. 62%. While doubtful bacteriuria with bacterial counts between 104 to 105 org/ml was encountered in 3 cases ie.1.5%. Growth of contaminants were seen in 20.5% cases (41/200) while sterile cultures were obtained in 16% cases.Among the significant bacteriuria cases, single pathogen was obtained in 91.9% cases (114 out of 124 cases), while two organisms were grown in 10 patients urines (8.1%).

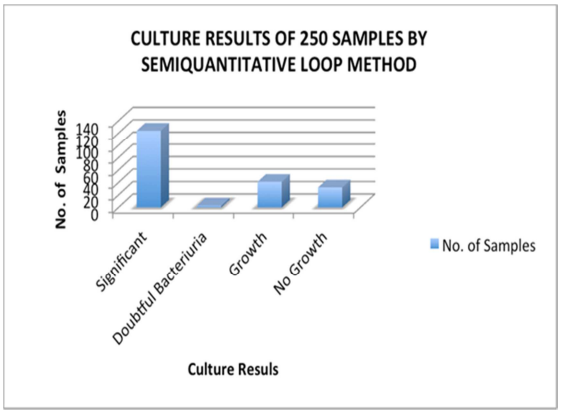
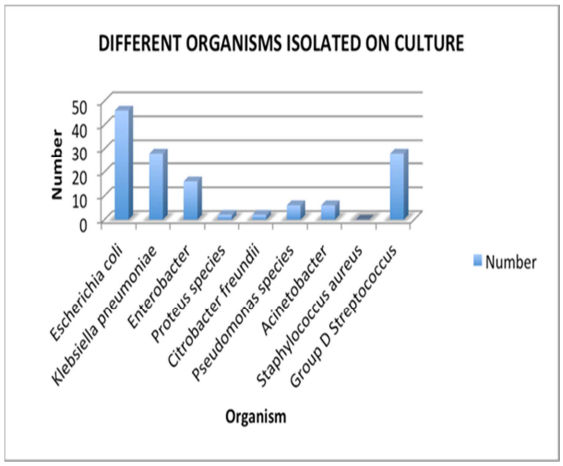


Table 7: Different organisms isolated on culture

Organisms	Number	Percentage
Escherichia coli	46	34.3
Klebsiella pneumoniae	28	20.9
Enterobacter	16	11.9
Proteus mirabilis	2	1.5
Citrobacter diversus	2	1.5
Pseudomonas aeruginosa	6	4.5
Acinetobacter baumanii	6	4.5
Staphylococcus aureus	0	0
Group D streptococcus	28	20.9
Total	134	100

In the present study isolation of gram negative bacilli were to the tune of 79.1%, while Gram positive cocci were 20.9% of the total. The commonest etiological bacterial pathogens among gram negative bacteria encountered in the present study were Escherichia coli i.e. 34.3% (46 out of 134 isolates), followed by Klebsiella pneumoniae (20.9%), Enterobacter species (11.9%). Pseudomonas aeruginosa and Acinetobacter baumanii accounted for 4.5% each of the total bacteria isolated. Two isolates of Proteus mirabilis and Citrobacter diversus were encountered in the present study. Among the gram positive bacteria isolated, group D streptococcus was cultured in 28 cases ie.20.9%.



From the above [Table 8A], it is evident that all members of Enterobacteriaceae family showed good sensitivity to ciprofloxacin (76.2%), Amikacin (88.6%) and Imipenem (86.9%); the percentages being cumulative. Most isolates showed high degree of resistance to Beta Lactams and Cephalosporins. Pseudomonas isolates showed a sensitivity of 100% to Imipenem and Amikacin, followed by Ciprofloxacin, Tobramycin and Pipercillin and Tazobactam showing the same sensitivity of (83.3%) each and lastly Carbenecillin showing sensitivity of (50%). Acinetobacter baumanii showed the highest sensitivity pattern with Imipenem, Amikacin and Piperacillin + Tazobactam showing sensitivity of 83.3%. Ciprofloxacin was the second sensitive drug with sensitivity of 66.6%. Antibiotic sensitivity pattern of gram positive cocci is depicted in Table No. 8B. Group D Streptococcus showed good sensitivity to Vancomycin (96.4%), Teicoplanin (82.1%) and Linezolid (82.1%).

DISCUSSION

Urinary tract infections (UTI) are common and can affect individuals in the community and in the hospital. UTI creates an interesting field to the physician and the microbiologist in the investigation, diagnosis and treatment of the disease. Clinically, the patient may be symptomatic or asymptomatic and if ignored, can cause varied complications. The present study evaluated the bacteriological profile of UTI in 200 patients with clinical suspicion of the disease, using culture method.

Table 8: Antimicrobial Sensitivity Pattern Of Isolates Encountered In The Study

A) Gram Negative Bacilli

Organism	amoxycillin	Amoxyclav	Roxithromycin	cotrimoxazole	Cephadroxy	Cefuroxime	cefotaxime	ceftazidime	Cefepime	Carbenicillin	Ciprofloxacin	Gentamycin	Amikacin	Netromycin	Tobramycin	Imipenem	Piperacilline Tazobactum
Escherichia Coli (n=46)	19 (41.3)	23 (50)	21 (45.6)	19 (41.3)	10 (21.7)	26 (56.5)	26 (56.5)	32 (69.5)	26 (56.5)	19 (41.3)	39 (84.7)	33 (71.7)	33 (71.7)	19 (41.3)	19 (41.3)	39 (84.7)	33 (71.7)
Klebsiella (n=28)	-	-	4 (14.2)	15 (53.5)	6 (21.4)	4 (14.2)	6 (21.4)	6 (21.4)	15 (53.5)	12 (42.8)	20 (71.4)	16 (57.1)	20 (71.4)	9 (32.1)	10 (35.7)	14 (50)	22 (78.5)
Enterobacter (n=16)	8 (50)	8 (50)	8 (50)	12 (75)	12 (75)	12 (75)	12 (75)	12 (75)	12 (75)	12 (75)	12 (75)	12 (75)	16 (100)	16 (100)	12 (75)	16 (100)	16 (100)
Proteae (n=2)	1 (50)	1 (50)	2 (100)	1 (50)	1 (50)	1 (50)	-	1 (50)	2 (100)	2 (100)	1 (50)	1 (50)	2 (100)	2 (100)	1 (50)	2 (100)	2 (100)
Citrobacter (n=2)	-	1 (50)	-	1 (50)	-	1 (50)	1 (50)	1 (50)	1 (50)	1 (50)	2 (100)	1 (50)	2 (100)	1 (50)	1 (50)	2 (100)	2 (100)
Pseudomonas (n=6)	-	-	-	-	-	-	-	5 (83.3)	5 (83.3)	3 (50)	5 (83.3)	5 (83.3)	6 (100)	3 (50)	5 (83.3)	6 (100)	5 (83.3)
Acinetobacter baumani (n=6)	2 (33.3)	3 (50)	2 (33.3)	3 (50)	2 (33.3)	3 (50)	3 (50)	3 (50)	-	2 (33.3)	4 (66.6)	3 (50)	5 (83.3)	3 (50)	3 (50)	5 (83.3)	5 (83.3)

NB: Figures in parenthesis indicate percentage

B.Gram Positive COCCI

Organism	Amoxicillin	Amoxyclav	Roxithromycin	Cephadroxyl	Cefurotin	Clindamycin	Linezolid	Vancomycin	Teicoplanin
Group D Streptococcus (n=28)	14 (50)	18 (64.2)	23 (82.1)	14 (50)	14 (50)	23 (82.1)	23 (82.1)	27 (96.4)	23 (82.1)

NB: Figures in parenthesis indicate percentage

Age and Gender Variable

UTI can occur at any time in the life of an individual and can affect both genders. In the present study, a large number of cases belonged to the age group 21-30 years i.e. 40.5% followed by individuals in the age group of more than 50 years (20.5%) and 31 to 40 years (19%). Similar results have been obtained by Prabhu and Mondrekar on 320 urine samples from UTI cases, wherein individuals in the age group 21 to 30 years were maximum.[6] Studies done in Kuwait by Orrett and Daris recorded a high incidence of UTI among the age group 20 to 50 years i.e. 63.4% and low in the age group above 50 years.[7] Increases in the incidence of UTI in age group 21-30 years is probably because these individuals are sexually active, which often predisposes to UTI. The fact that UTI affects the female gender, has long been recognised and is being confirmed in the present study. The male female ratio was 0.25:1. Similar findings have been observed in other studies. Prakash and Ramchandra recorded a high prevalence of 73.57% infection in females in their study on 288 patients.[8] This high prevalence in females was also seen in the study of Gracia-Norua and Hernandez- Torres.[9] The higher incidence in females is probably due to the anatomical proximity of the urethral meatus to the anus, short urethra and bad toilet.

Marital Status and Occupation

In the present study, UTI occurred predominantly among married individuals to the tune of 85%. In both categories, females predominated. Similar

findings were observed by Kunin (1994).[10] Increased sexual activity and/or increased use of diaphragm and spermicide appear to be important factors related to increased risk of UTI in married females. It is postulated that bacteria from the woman's vagina are pushed into the urinary tract during the sexual intercourse. Further, use of a spermicide selectively kills harmless bacteria, without affecting those that irritate the urinary tract as stated by Kunin (1994).[12] Evaluation of occupation of the study subjects revealed that housewives accounted for 47.5% of the total, in the present study, followed by unemployed individuals (16%). Housewives being the major group to suffer from UTI in this study; is probably related to an overall preponderance of female subjects.

Socio Economic Status

In the present study, the occurrence of UTI increased with lower socioeconomic status; with 51.5% subjects being from the lower class. Patients with UTI belonging to the middle class were 44%. Increased prevalence of UTI among lower socioeconomic strata individuals was also seen in the study of Sharma and Deepjyoti (2012).[11] Poor personal and environmental hygiene along with improper sanitary measures contribute to increased risk to develop UTI among individuals belonging to lower socioeconomic strata of society. Lack of awareness and knowledge also probably helps to increase the prevalence of UTI in this group of individuals.

Risk Factors Associated With UTI

In the present study, pregnancy was observed as a significant risk factor; it being present in 60.5% subjects, followed by Diabetes Mellitus, history of instrumentation and renal calculi in 19.5%, 7.4% and 5.4% cases respectively. In the study of Lucas and Cunningham (1993), pregnancy was also seen as an important risk factor.[12] However Nath and Chaudhary (1996) conducted a study of UTI and observed the incidence during preganancy to be 9.05%.[13] A recent history of urogenital instrumentation other than catheterisation alone was seen in 11.4% subjects.

In pregnancy, a number of virulence determinants contribute to causation of UTI. Presence of adhesins, stasis produced by the gravid uterus, hormonal effect of reducing the ureteric musculature tone and increased excretion of glucose providing a culture medium for bacterial growth have been incriminated in leading to UTI in preganancy as stated by Hytten and Leitch.[14] Catheter associated UTI is an important nosocomial infection. Formation of biofilms on both inner and outer surface of the catheter causes and adds to the protracted nature of this kind of UTI as opine by Stamm.[15] Obstructive factors such as calculi, strictures and neoplasms also contribute to UTI by serving as nidus for fostering bacteria.

Cultural Analysis of Study Subjects

Urine culture involves determination of the number of bacteria per unit volume, making it a semiquantitative analytical method. The count of viable bacteria in a mid-stream, clean catch urine sample serves as the gold standard for diagnosis of bacteriuria and hence diagnosis of UTI. In the present study, significant bacteriuria was observed in 62% cases, while doubtful bacteriuria for growth of contaminants was seen in 22% cases. Sterile cultures were encountered in 16% subjects. The percentage of significant bacteriuria reported in various studies is depicted in [Table D1].

Table D1: Percentage of Significant Bacteriuria Observed By Different Workers

Sr. No.	Authors	Year	% of significant bactetriuria
1	Okonko [16]	2010	47.5
2	Sharma [11]	2012	65
3	Prakash[8]	2013	53.8
4	Present study	2015	62

From the above [Table D1] it is evident that rate of significant bacteriuria, thus indicating UTI, varied from 8.4% to 65%. Finding similar to the present study was seen in the study of Sharma and Deepjyoti (2012), from Assam.[11] The wide variation in the UTI prevalence among various studies is probably due to selection of different categories of patients, which extended from complicated and uncomplicated UTI, patients with obstruction, antenatal mothers and general population. A high UTI rate in the present study could be due to selection of patients, with careful history undertaken and exclusion of patients who had received antimicrobial therapy.

Etiology of UTI

In the present study, a total of 134 organisms were isolated from 124 culture positive cases. Single organism was isolated in 91.9% cases while in the remaining 8.1% subjects, two bacteria were isolated. [Table D2] depicts the percentage isolation of various bacterial pathogens in UTI.

Thus, it is evident from [Table D2], that Escherichia coli was and continues to be the predominant pathogen, causing UTI. The second most frequent isolates in the present study were Klebsiella pneumoniae and Group D Streptococcus (each 20.9%). Klebsiella, as the second most common bacterial species was encountered in the studies of Eshwarappa and Dosegowda (2011),[17] and Thakre and Supriya.[18] Other members of Enterobacteriaceae were isolated, albeit in low numbers (Table D2).

In the present study, Staphylococcus aureus was not isolated from any urine of the study subjects.

However, it was isolated in many studies, the percentage isolation varying from 2.2% to 28.9% [Table D2]. In the study of Okonko and Ijandipe (2010), it was the second most frequently isolated pathogen. 18 Group D Streptococcus was the second most common pathogen in the present study (20.9%) as also seen in the study of Dash and Padhi (2013).[19]

Table D2: percentage isolation of various bacterial pathogens in UTI

	Authors and Year						
Bacterial Type	Okono (2010)[16]	Eshwarappa (2011)[17]	Sharma (2012)[11]	Thakre (2012)[18]	Dash (2013)[19]	Prakash (2013)[8]	Present study (2015)
Escherichia coli	42.1	66.9	33.3	62.06	68.8	42.58	34.3
Klebsiella pneumonia	18.4	15.5	11.1	6.9	2.9	18.71	20.9
Enterobacter	-	2.4	-	-	1.2	7.10	11.9
Proteae	-	1.0	3.7	3.45	1.4	9.03	1.5
Citrobacter	-	2.5	-	-	2.3	-	1.5
Pseudomonas aeruginosa	5.3	10.2	7.4	-	1.6	12.9	4.5
Acinetobacter baumanii	-	-	-	-	-	-	4.5
Staphylococcus aureus	28.9	-	22.2	-	4.9	9.68	-
Group D streptococcus	-	1.6	-	6.9	9.7	-	20.9

Gram negative aerobic rods including Enterobacteriacea have several factors which help them to adhere to the uroepithelial cells. These factors have been identified as adhesins, pili, fimbria and p-1 blood group phenotype receptor as opined by Das and Chandra (2006).[20] Escherichia coli strains carrying K antigens are more commonly responsible for pyelonephritis. The uropathogenic Escherichia coli replicate and persist in intracellular and extra cellular niches. Further, host and environmental stresses either threaten or enhance their viability as stated by Gawel and Seed (2011).[21]

Antibiotic Sensitivity Pattern of Isolates

In the present study, gram negative isolates showed overall maximum sensitivity to Imipenem followed by Amikacin and Piperacillin-Tazobactum. All gram negative bacilli showed least sensitivity to Cephalosporins and Cotrimoxazole.

In a study by Eshwarappa and Dosegowda, organisms recorded least resistance against Carbapenems (3.9%). Carbapenems had the least resistance (3.9%), followed by Amikacin (28.0%). A high rate of resistance was recorded against quinolones (74.1%).[17] Study by Dash and Padhi revealed that among Gram-negative bacteria, the most common isolate E. coli showed high level of resistance to commonly used empirical antibiotics β-lactams (Ampicillin, Augmentin, Cefaclor, and Cefpodoxime), fluoroquinolones (Ciprofloxacin and Ofloxacin) and Co-trimoxazole. Aminoglycosides i.e., Amikacin showed low resistant rate of 15.9% and 5.8%, respectively for Escherichia coli.[19]

In the present study, in case of Gram positive organisms sensitivity ranged from Vancomycin (96.4%) to Teicoplanin and Linezolid, each with sensitivity of 82.1%. Management of UTI has been made more complicated due to growing resistance, especially to Beta Lactams and Cotrimoxazole among uropathogens over the past few years. The Infectious Disease Society of America guidelines consider Co-trimoxazole, Fluoroquinolones, Nitrofurantoin and β-lactams including Augmentin, Cefdinir, Cefaclor, Cephalexin, Cefpodoxime-proxetil as current standard empirical therapy for uncomplicated UTI in women. [22]

CONCLUSION

The present study evaluated bacteriological culture analysis of 200 urine samples from clinically suspected cases of urinary tract infections . A large number of cases belonged to the age group 21-30(40.5%) followed by individuals in the age group of more than 50 years (20.5%) and 31-40 years (19%). Females were more affected than males. The male female ratio being 0.25:1. Majority of subjects were married i.e. 85%. Housewives accounted for 47.5% of the total, followed by unemployed individuals (16%). Subjects belonging to lower class were 51.5%, while individuals belonging to the middle class were 44%. Pregnancy was an important factor associated with UTI (62%), while Diabetes mellitus was identified in 19.5% cases. Culture analysis by semi-quantitative loop method was as follows: Significant bacteriuria was seen in 62% cases (124/200) with monobacterial etiology was observed in 91.9% cases. Commonest etiological bacterial pathogen was Escherichia coli (34.3%) followed by Klebsiella pneumoniae (20.9%) and Group D Streptococcus (20.9%).

Determination of the number and type of bacteria in the urine are extremely important diagnostic procedures. Urine culture and antimicrobial susceptibility testing should be performed for any patient with suspected UTI for the accurate treatment.

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