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Isolation and Characterization of Multi Drug Resistant *Escherichia coli* Isolated from Urinary Tract Infected Patients

Mukesh Kumar[1] and Jaya Bharti[2]
[1] and [2]Mewar University Gangrar Chittorgarh Raj

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***Corresponding Author Email:** bhargav@syncorp.in

Abstract

Incessant uses of antibiotics cause the antibiotic resistance, enhance special pattern of antibiotic resistance among the ***E. coli*** isolates which are obtain from patient surfing with urinary tract infection (UTI). This study was conducted to spot and isolate resistant multi drug uropathogenic ***Escherichia coli*** from piddle sample of tract infected patients by ancient techniques. Fifty-seven (57) UTI piddle samples were collected from patients admitted to near ELITE DIAGNOSTIC CENTRE BHILWARA (RAJ). Out of fifty-seven piddle samples, forty samples square measure positive for ***E. coli*** among that twenty-two samples square measure collected from females and eighteen from male. Growth for ***E. coli*** confirmed by culture characteristics (Table five.1) and then different biochemical test (Table five.2). Characterization of isolated strains resolve by biochemical tests included indole, oxidase, catalase, methyl red, voges proskauer, citrate utilization, hemolytic, motility and microscopic finding done by Gram staining. Sensitivity pattern of isolates were determined against antibiotics. From this study, it had been discovered that 70.17% isolates were gram negative. The ***E. coli*** positive samples square measure shows indole, enzyme (+ve) and VP, PYR, OXIDASE, UREASE, citrate Utilization (-VE) (table five.2). Positive samples square measure any analyzed for antibiotic susceptibleness testing among 40 samples 33 square measure showing resistance for quite 15 antibiotics. 2 samples were resistance for quite 20 antibiotics. different sample square measure resistance for concerning 5 to 10 antibiotics table (5.3, a, b, c). Out of 57 sample 40 uropathogenic ***E. coli*** was isolated and every one of them has been multi drug resistant.

Keywords
Multi drug resistant, uropathogenic *Escherichia coli*, disc agar diffusion, antibiotic susceptibleness.

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INTRODUCTION

In 1885, the German-Austrian baby doctor Theodor Escherich revealed coli bacteria inside the stool of healthy individual. These bacteria referred to as microorganism coli community as an effect of it's found inside the colon. (1) In 1996 the world's worst happening illness occurred in Wishaw, Scotland, of ***E. coli*** killing twenty folks Most ***E. coli*** strains square measure harmless, however some serotypes square measure infective and might cause serious urinary

tract infections. Whereas some might profit their hosts by manufacturing vitamin k2, and by preventing the institution of infective bacterium at intervals the intestine [3] 91% of tract infections (UTI) seen in people with standard anatomy Uropathogenic ***E. coli*** (UPEC) is answerable for just about. In ascending infections, dirty bacterium colonize the urethra and spread up the urinary tract to the bladder as well as to the kidneys (causing pyelonephritis-Pyelonephritis is inflammation of the kidney, usually due to a microbial infection. Symptoms most frequently included fever, tenderness etc. as a result of girls have a shorter channel than men, they're fourteen times a lot of seemingly to suffer from associate ascending UTI [6][7]. Uropathogenic E.coli use fimbriae for adherence on the surface of urothepithelial and bladder.

Antibiotics are typically used for the treatment of Bacterial infection. However, the antibiotic sensitivities of various strains of ***E. coli*** vary wide. As gram negative organisms, ***E. coli*** square measure proof against several antibiotics that square measure effective against gram-positive organisms. Antibiotics which can be accustomed treat **E. coli** infection embody Trimox, yet as different. Semisynthetic, penicillin's, many cephalosporin's, carbapenems, aztreonam, trimethoprim sulfamethoxazole, antibiotic drug, Macrodantin and therefore the aminoglycosides. Antibiotic resistance may be a growing downside. ***E. coli*** bacterium typically carry multiple drug resistance plasmids, and below stress, pronto transfer those plasmids to different species. Intermixture of species within the intestines permits **E. coli** to simply accept and transfer plasmids from different bacterium. Thus, **E. coli** and therefore the different enteric square measure vital reservoirs of transferable antibiotic resistance [10]. Sometimes, the term antibiotic which suggests "opposing life", they will either kill or inhibit the expansion of bacterium.

MATERIALS AND METHODS

Culture Media and Chemicals:- Mueller-Hinton broth, Mac Conkey agar, Simmon's Citrate agar, cled agar, Michrome agar, Antibiotic discs such as penicillin G, ampicillin, chloramphenicol, tobramycin, levofloxacin, nitrofurantioinorfloxacin, ciprofloxacin, amikacin cephotaxime gentamycin, streptomycin, tetracycline, erythromycine and imipenem, meropenem, cefepime, cefazolin, aztreonam, netilmycin, doxycycline, colistin, imipenem, cefazolin, ceftazidime, meropenem, aztreonam, minocycline, Sodium chloride (Nacl), hydrogen peroxide (H2O2), sucrose, lactose, glucose, galactose, potassium dihydrogen phosphate (KH2PO4), di potassium hydrogen phosphate (K2HPO4), sodium hydroxide (NaOH), potassium chloride (Kcl), Goa, India. All other chemicals were from A Division of tulip diagnostics (P) Ltd., Microxpress Pvt. Ltd

COLLECTION AND TRANSPORT OF SAMPLE

Fifty-seven (57) UTI patient's urine samples were collected from patients admitted in hospitals nearby Elite diagnostic and imaging centre bhilwara according to their infection history and treatment summary during a one-month period from June 03, 2019 to July 10, 2019. Those urine samples were collected in 'clean catch' with sterile clean bottles. Then used the autoclaved for sterilization of different media. Inoculation of sample was performed within 2 hours of the collection.

ISOLATION OF *E. coli*. Urine inoculated in Mac Conkey agar and cled agar was incubated in an incubator at 37°C for overnight. Isolates were characterized on the basis of culture characteristic (Patrick R. et al (Manual clinical microbiology 9tha ED.

Quality control strains. Shigella flexneri ATCC 12022, S. aurous ATCC 25923, Salmonella typhimurium ATCC 14028, ***E. coli*** ATCC 25922, *E. faecalis* ATCC 29212, Pseudomonas *aeruginosa*, ATCC 27853, *Enterobactor aerogenes* ATCC 13048, *Proteus vulgaris* ATCC 13315, and Acinetobacter calcoaceticus ATCC 19606 were obtained from Elite diagnostic and imaging centre Bhilwara. These strains were stored in agar slants at 4°C for further studies as reference strains

IDENTIFICATION AND CHARACTERIZATION OF *E.coli*

Isolate identified on the basis of culture characteristics, biochemical test and microscopic examination. *E.coli* ATCC 25922 was taken as positive control for identification of all the test result.

CULTURE CHARACTERISTIC. Bacteria grow on Mac Conkey agar and cled agar media used for identified culture characteristics.

Microscopy. Gram staining of isolates was performed according to standard method. (Duguid JP, 1999).

BIOCHEMICAL CHARACTERIZATION TESTS

Catalase Test. For slide catalase test, 2-3 colonies of isolates were taken from NA plate with sterile loop and spotted onto the centre of a glass slide. One drop of 3-6% H2O2 was added on it and observed the vigorous bubbling within 10 seconds. For tube catalase test, 200µl of 3-6% hydrogen peroxide (H2O2) was taken in a test tube. A colony of isolates was taken from NA plate with disposable loop and rubbed onto the inside wall of the test tube and

examined the vigorous bubbling within 10 seconds. Proteus vulgaris ATCC 29906 and E. faecalis ATCC 29212 were taken as positive and negative control respectively (MacFaddin JF. 2000).

Oxidase Test. Oxidase test with a disposable loop some fresh growth of isolates from NA plate was scraped and rubbed onto the filter paper and examined for the blue colour within 10 seconds Oxidase test of isolates was performed by filter paper method according to Snell et al. (Snell et al.1999). S.aureus ATCC 25923 and Proteus vulgaris ATCC 29906 were taken as positive and negative control respectively.

Indole Test. Indole test Development of a red/pink layer on top of the media was considered as positive result whereas absence of red colour was the indication of negative result. Shortly, bacterial isolates were grown on TSB (tryptic soy broth) for 48 hours. After that Kovac's reagent was added to those culture media. Proteus vulgaris ATCC 29906 and Pseudomonas aeruginosa 27853 were taken as positive and negative control strains respectively. Indole test was done according to standard method (Finger gold et al. 1974).

Antibiotic Susceptibility Test by Disc Agar Diffusion

Antimicrobial susceptibility was determined by the Kirby-Bauer disk diffusion method Dashet al., (Dash et al., 2012) and according to the method of Chakraborty SP et al. 2011b. The tested bacterium was from an overnight culture (inoculated from a single colony) and freshly grown for 4 hours at approximately 106 CFU/ml. With this culture, a bacterial lawn was prepared on Mueller-Hinton agar.

RESULT

In the present study, 57 urine samples were collected from patient which are admitted in hospital nearby Elite diagnostic and imaging centre, Bhilwara. Out of 57 urine samples, 40 samples are positive for E.coli among which 22 samples are collected from females and 18 from male . Growth for E.coli confirmed by culture characteristics (Table.1) and further by different biochemical test (Table .2). Morphological characters were examining by gram staining techniques.

All positive samples were used for identification of antibiotic resistance. Antibiotic sensitivity testing by disk diffusion method was carried out for all 40 isolates among which 33 isolates were showing drug resistance for more than 15 antibiotics. The E.coli positive samples are shows indole, catalase (+ve) and VP , PYR, OXIDASE, UREASE, Citrate Utilization (-VE) (table .2). Positive samples are further analyzed for antibiotic susceptibility testing among 40 sample 33 are showing resistance for more than 15 antibiotics. Two samples were resistance for more than 20 antibiotics. Other sample are resistance for about 5 to 10 antibiotics.

Table 1: -Culture Characteristic

Sample	Gram Staining & Pathogen	Colony Forms	Color pigmentation	Height (elevation)	Edge (Margin)	Size (mm)
S1u	-ve *E.coli*	circular	Pinkesh	Flat	Entire	1mm
S2u	-ve Pseudomonas spp	Irregular	Color less	Raised	Undulate	3-4mm
S3u	+ve Staphylococci Spp	Irregular	slightly pink	Raised	Entire	1mm
S4u	-ve Pseudomonas spp	Irregula	Pinkesh	Raised	Entire	2mm
S5u	-ve *E.coli*	circular	slightly pink	Raised	Entire	1-2mm
S6u	-ve *E.coli*	circular	Pinkesh	Raised	Entire	1-2mm
S7u	-ve Pseudomonas spp	Irregular	Color less	Raised	Undulate	3-4mm
S8u	-ve *E.coli*	circular	Pinkesh	Raised	Entire	1-2mm
S9u	-ve Pseudomonas spp	Irregular	Color less	Raised	Undulate	3-4mm
S10u	+ve Staphylococci Spp	Irregular	slightly pink	Raised	Entire	1mm
S11u	-ve *E.coli*	circular	Pinkesh	Raised	Entire	1-2mm
S12u	-ve Pseudomonas spp	Irregular	Color less	Raised	Undulate	3-4mm
S13u	-ve *E.coli*	circular	Pinkesh	Raised	Entire	1-2mm
S14u	-ve *E.coli*	circular	Pinkesh	Raised	Entire	1-2mm
S15u	-ve Pseudomonas spp	Irregular	Color less	Raised	Undulate	3-4mm

S16u	-ve E.coli	circular	Pinkesh	Raised	Entire	1-2mm
S17u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm
S18u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm
S19u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm
S20u	**-ve Pseudomonas spp**	Irregular	Color less	Raised	Undulate	3-4mm
S21u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm
S22u	**-ve Pseudomonas Spp**	Irregular	Color less	Raised	Undulate	3-4mm
S23u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm
S24u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm
S25u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm
S26u	**-ve Pseudomonas spp**	Irregular	Color less	Raised	Undulate	3-4mm
S27u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm
S28u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm
S29u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm
S30u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm
S31u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm
S32u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm
S33u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm
S34u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm
S35u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm
S36u	+ve Enterococcus spp	Irregular	slightly pink	Raised	Entire	1mm
S37u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm
S38u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm
S39u	**-ve *E.coli***	circular	Pinkesh	Raised	Entire	1-2mm

S40u	-ve *E.coli*	circular	Pinkesh	Raised	Entire	1-2mm
S41u	-ve *E.coli*	circular	Pinkesh	Raised	Entire	1-2mm
S42u	-ve **Pseudomonas spp**	Irregular	Color less	Raised	Undulate	3-4mm
S43u	-ve *E.coli*	circular	Pinkesh	Raised	Entire	1-2mm
S44u	-ve *E.coli*	circular	Pinkesh	Raised	Entire	1-2mm
S45u	+ve **Staphylococci Spp**	Irregular	slightly pink	Raised	Entire	1mm
S46u	-ve *E.coli*	circular	Pinkesh	Raised	Entire	1-2mm
S47u	-ve *E.coli*	circular	Pinkesh	Raised	Entire	1-2mm
S48u	-ve *E.coli*	circular	Pinkesh	Raised	Entire	1-2mm
S49u	-ve *E.coli*	circular	Pinkesh	Raised	Entire	1-2mm
S50u	+ve **Staphylococci Spp**	Irregular	slightly pink	Raised	Entire	1mm
S51u	-ve *E.coli*	circular	Pinkesh	Raised	Entire	1-2mm
S52u	+ve **Staphylococci Spp**	Irregular	slightly pink	Raised	Entire	1mm
S53u	-ve *E.coli*	circular	Pinkesh	Raised	Entire	1-2mm
S54u	-ve *E.coli*	circular	Pinkesh	Raised	Entire	1-2mm
S55u	+ve **Staphylococci Spp**	Irregular	slightly pink	Raised	Entire	1mm
S56u	-ve *E.coli*	circular	Pinkesh	Raised	Entire	1-2mm
S57u	-ve *E.coli*	circular	Pinkesh	Raised	Entire	1-2mm

Table 2: ***Standard biochemical tests for clinical isolates, collected from urine sample of UTI patient. ND = Tests are not done, + ve = tests are positive, - ve = tests are negative, F=Female, M=Male***

Sample	Isolates & sex	Gram Staining	Indole	Oxidase	Catalase	PYR	VP	Urease	Citrate Utilization	Result
S1	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S2	Urine Male	-ve	ND	ND	ND	ND	ND	ND	ND	Pseu. spp
S3	Urine Female	+ve	ND	ND	ND	ND	ND	ND	ND	Staph. spp
S4	Urine Male	-ve	ND	ND	ND	ND	ND	ND	ND	Pseu. spp
S5	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S6	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S7	Urine Female	-ve	ND	ND	ND	ND	ND	ND	ND	Pseu. spp
S8	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S9	Urine Male	-ve	ND	ND	ND	ND	ND	ND	ND	Pseu. spp
S10	Urine Female	+ve	ND	ND	ND	ND	ND	ND	ND	Staph. spp
S11	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S12	Urine Male	-ve	ND	ND	ND	ND	ND	ND	ND	Pseu. spp
S13	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S14	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S15	Urine Male	-ve	ND	ND	ND	ND	ND	ND	ND	Pseu. spp
S16	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S17	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S18	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S19	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S20	Urine Female	-ve	ND	ND	ND	ND	ND	ND	ND	Pseu. spp
S21	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S22	Urine Female	-ve	ND	ND	ND	ND	ND	ND	ND	Pseu. spp
S23	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S24	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli

S25	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S26	Urine Female	-ve	ND	ND	ND	ND	ND	ND	ND	Pseu. spp
S27	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S28	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S29	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S30	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S31	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S32	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S33	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S34	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S35	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S36	Urine F Female	+ve	-ve	+ve	+ve	-ve	-ve	-ve	-ve	Ente. spp
S37	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S38	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S39	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S40	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S41	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S42	Urine Female	-ve	ND	ND	ND	ND	ND	ND	ND	Pseu.spp
S43	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S44	Urine Male	+ve	ND	ND	ND	ND	ND	ND	ND	Staph. spp
S45	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S46	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S47	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S48	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S49	Urine Male	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S50	Urine Male	+ve	ND	ND	ND	ND	ND	ND	ND	Staph. spp
S51	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli

S52	Urine Male	+ve	ND	ND	ND	ND	ND	ND	ND	Staph. spp
S53	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S54	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S55	Urine Female	+ve	ND	ND	ND	ND	ND	ND	ND	Staph. spp
S56	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli
S57	Urine Female	-ve	+ve	-ve	+ve	-ve	-ve	-ve	-ve	E.coli

Table 3.a: Pattern of multidrug resistance among uropathogenic *E. coli* isolates.s:-susceptible, I:-intermediate R:-resistance and s1 s2…..s40 :- sample

S.No	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14
Amp	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Tob	R	I	S	S	R	S	R	I	R	S	S	R	R	R
Ak	R	S	S	S	R	S	R	S	R	S	S	R	S	S
Cip	R	R	R	R	R	R	R	R	S	R	R	R	R	R
Gen	R	S	S	S	R	S	R	S	S	S	S	R	S	R
Le	R	R	R	R	R	R	R	R	S	R	R	R	R	R
Nit	S	S	S	S	S	S	S	S	I	S	S	R	S	S
Nor	R	R	R	R	R	R	R	R	S	R	R	R	R	R
Te	R	R	S	R	R	S	R	R	S	S	S	R	R	R
Cot	R	R	S	R	R	S	R	R	S	R	S	R	R	R
Tcc	R	R	S	S	R	S	R	R	I	R	S	R	R	S
Ctr	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Amc	R	R	R	S	R	S	R	R	R	R	R	S	R	S
Cz	R	R	S	R	R	R	R	R	R	R	R	R	R	S
Cpm	R	R	S	S	R	S	R	R	R	R	S	R	R	R
Caz	R	R	S	S	R	S	R	R	I	R	S	R	R	R
Fo	R	S	S	S	R	S	S	S	S	S	S	S	S	S
At	I	R	S	S	I	S	R	R	R	R	S	R	R	I
Mrp	R	S	R	S	R	S	R	S	R	R	S	S	R	S
Na	R	R	S	R	R	R	R	R	R	R	R	R	R	R
Ptz	R	S	S	S	R	S	R	S	S	R	S	S	R	S
A/s	R	R	R	S	R	S	R	R	R	R	S	R	R	S
Azm	R	R	S	S	R	S	R	R	R	R	R	S	I	R
Cx	R	R	S	S	R	S	R	R	R	R	S	S	R	S
Dor	R	S	S	S	R	S	R	S	R	R	S	S	R	S
Ipm	R	S	S	S	R	S	R	S	R	R	S	R	R	S
Col	S	S	S	S	R	S	R	S	R	S	S	S	S	R
C	s	S	S	S	S	S	R	S	R	R	S	S	S	S
Cf	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Dox	R	S	S	S	R	S	R	S	R	S	S	S	S	R

Table: 3. b

S.no	S 15	S 16	S 17	S 18	S1 19	S 20	S 21	S 22	S 23	S 24	S 25	S 26	S 27	S 28
Amp	R	R	S	R	R	R	R	R	R	R	R	R	R	R
Tob	S	S	I	R	R	R	S	R	R	R	S	R	S	S
Ak	S	S	I	R	R	R	S	I	S	S	S	S	S	S
Cip	R	R	I	R	S	R	R	R	R	R	S	S	R	R
Gen	S	S	R	R	R	S	S	R	R	R	S	R	S	S
Le	R	R	R	R	S	R	R	R	R	R	S	S	R	R
Nit	S	S	S	I	S	S	S	I	S	S	S	S	S	S
Nor	R	R	S	R	S	R	R	R	R	R	S	S	R	R
Te	S	R	S	S	R	R	R	S	R	R	S	R	R	R
Cot	R	R	S	R	R	S	R	R	S	S	R	R	R	S
Tcc	S	S	S	R	R	R	R	R	S	S	S	S	R	R
Ctr	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Amc	S	S	S	R	R	S	R	S	S	R	S	S	R	R
Cz	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Cpm	S	S	S	R	R	S	R	R	R	R	R	R	R	R
Caz	S	S	R	I	R	R	R	R	S	R	S	S	R	R
Fo	S	S	S	I	S	S	S	S	S	S	S	S	S	S
At	S	S	S	I	S	S	R	R	R	R	R	S	R	R
Mrp	S	S	S	I	S	S	R	S	S	S	S	S	R	S
Na	R	R	S	R	S	R	R	R	R	R	R	R	R	R
Ptz	S	S	R	I	R	S	R	S	S	S	S	S	R	R
A/s	S	S	S	R	R	S	R	R	I	R	S	I	R	R
Azm	S	S	S	R	R	S	R	R	S	S	S	S	R	S
Cx	S	S	S	R	R	S	R	I	S	S	S	S	R	R
Dor	S	S	R	R	S	S	R	S	S	S	S	S	R	S
Ipm	S	S	S	R	R	S	R	R	R	R	R	R	R	S
Col	S	S	S	S	S	R	S	S	S	S	S	S	S	S
C	S	S	S	R	S	S	R	R	S	S	S	S	R	S
Cf	R	R	S	R	R	S	R	R	R	R	S	R	R	R
Dox	S	S	S	S	S	R	S	S	S	S	S	I	S	R

Table 3.c

S.no	S 29	S 30	S 31	S 32	S 33	S 34	S 35	S 36	S 37	S 38	S 39	S 40
Amp	R	R	R	R	S	S	R	R	R	R	R	R
Tob	S	S	S	S	S	R	R	S	S	I	R	I
Ak	S	S	S	S	I	S	R	S	S	S	I	S
Cip	R	R	R	R	I	R	R	R	R	S	R	R
Gen	R	S	S	S	S	S	R	S	S	R	S	I
Le	R	R	R	R	R	R	R	R	R	R	R	R
Nit	S	S	S	S	S	S	S	S	S	S	S	S
Nor	R	R	R	R	I	R	R	R	R	R	R	R
Te	R	R	R	S	I	S	R	R	R	R	R	R
Cot	R	I	S	S	S	S	R	S	R	R	I	R
Tcc	S	S	R	S	S	S	R	R	S	S	R	R
Ctr	R	R	R	I	I	R	R	R	R	R	R	R
Amc	S	S	R	S	S	S	R	R	S	R	R	R
Cz	R	R	R	R	R	S	R	R	R	R	R	R
Cpm	S	S	R	I	I	S	R	S	R	R	R	R

Caz	S	S	R	S	I	R	R	R	S	R	R	S
Fo	S	S	S	S	S	R	S	S	S	R	S	S
At	S	S	R	S	I	R	R	I	S	R	R	R
Mrp	S	S	S	S	I	R	R	S	S	R	S	R
Na	R	R	R	R	I	R	R	R	R	R	R	R
Ptz	S	S	S	S	S	S	R	S	S	S	R	S
A/s	S	S	R	S	S	S	R	R	S	R	R	R
Azm	S	S	S	S	S	R	I	S	I	S	I	S
Cx	S	S	R	S	S	I	R	R	S	R	R	S
Dor	S	S	S	S	S	S	R	S	S	S	S	S
Ipm	S	S	S	S	S	S	R	S	S	R	S	S
Col	S	S	S	S	I	S	S	S	S	I	S	S
C	S	S	S	S	S	S	S	S	S	R	S	R
Cf	R	R	R	R	I	R	R	R	R	S	R	S
Dox	S	S	R	S	S	S	R	S	R	S	I	S

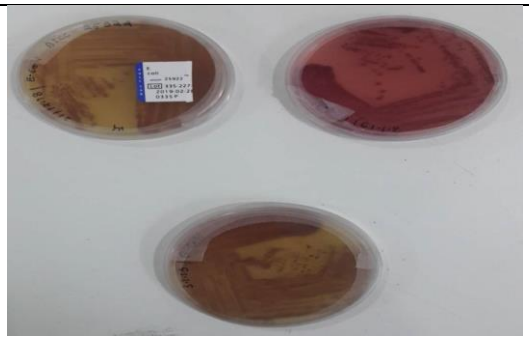

Fig no. 1 Isolation of E. coli on MacConkey agar , Michrome Agar and C.L.E.D Agar

Fig no. 2 Antibacterial Susceptibility test

CONCLUSION

It is quite alarming to note that almost all of the isolates included in this study were found resistant to seven or more antibiotics. Antibiotic resistance is becoming a big problem for the individuals admitted to health care centers with chronic conditions as well as for medical professionals.

All isolates showed multiple antibiotic resistance property, maxi-mum resistance was found against Ampicillan, levofloxacin, cefazolin, cefxime, nalidixic acid, ciprofloxacin, norfloxacin.

Whereas least resistance was detected against cephotaxime, amikacin and chloramphenicol. All twenty isolates were sensitive to Chloramphenicol, colistin, doxycycline, nitrofurantoin, and fosfomycin and hence those might be the drugs of choice to treat UPEC.

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