

Original Research Article

Study of Antibiotic sensitivity pattern of *Escherichia coli* isolated from clinical Pus swab samples of the patients attending a tertiary care hospital (C.G.)

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Abstract: This research project is conducted between March 2019 To August 2021 in the Department of Microbiology. A total of 1000 various clinical samples received in the microbiology laboratory from the OPD & IPD Patients. Out of 1000 various clinical samples culture, were found total 500 (50%) gram negative bacilli (*Escherichia coli*). But, were found total 45 (09%) *E.coli* from pus swab culture.

Keywords: Pus swab Samples, Gram negative bacilli (*Escherichia coli*) isolates and antimicrobial sensitivity pattern .

1. INTRODUCTION:

Escherichia coli is a Gram-negative, rod-shaped bacterium that typically resides in the lower intestinal tract of humans. It is also found in hospital environments and can cause nosocomial infections (1). *Escherichia coli* is one of the most frequent causes of urinary tract infection (2, 3) and is among the most important pathogens causing bloodstream infections (4), otitis media, wound infections, neonatal meningitis, and nosocomial pneumonia (5, 6). *Escherichia coli* is a major cause of waterborne and foodborne human diarrhea worldwide, especially in developing countries, causing several deaths, particularly in children under five-years-old (7).

Globally, antimicrobial resistance is a serious public health concern, particularly in developing countries where infectious diseases, malnutrition, and poverty are endemic (8-10). It is one of the main causes of failure in the treatment of infectious diseases, including infections caused by *E. coli*, resulting in increased morbidity, mortality, and cost of healthcare services (11).

The prevalence and susceptibility profile of clinical isolates of *E. coli* show substantial variations in geographical locations, as well as significant differences in various populations, clinical samples, and environments (9).

2. MATERIAL AND METHODS:

Pus sample should be collected in a wide mouth screw capped sterile container or, catheter tube, pre-sterilised disposable swab or, syringe and it was labelled with the patients name, age, sex, etc.

Sample processing: Pus swab sample should be inoculated on to MacConkey agar, chocolate agar & Blood agar. It was incubated at 37^o C for 24-48 hours. The coloneal morphology and identification was done by Gram staining.

Biochemical tests:-**i :- Catalase test (+)ve**

ii :- Oxidase test (-)ve

iii :- Glucose test (AG) Acid & gas

iv :- Lactose test (+)ve

v :- Mannitol test (+)ve

vi :- Sucrose test (-)ve

vii :- Indole test (+)ve

viii :- Urease test (-)ve

ix :- Citrate test (-)ve

x :- Methyl red (MR) test (+)ve

xi :- Voges – proskauer(VP) test (-)ve

Antibiogram Testing:

Antimicrobial susceptibility testing of isolates was performed by standard Kirby Bauer disc diffusion methods according to CLSI protocol. Depending on the isolate, antibiotic discs were selected from among the following: Amikacin(AK), Ampicillin(AMP), Co-Trimoxazole(COT), Ciprofloxacin(CIP), Gentamycin(GEN), Cefotaxime (CTX), Ofloxacin(OF), Doxycycline(DO), Piperacillin-Tazobactam(PIT) and Imipenem (IPM) .

The antibiogram testing was done as per CLSI guidelines using modified Kirby-Bauer disc diffusion method. Few colonies from the culture plate were inoculated into 2ml of peptone water. Incubated at 37^oc for 2 hrs. A cotton swab was immersed and rotated in this inoculum, the swab was then pressed to the side of the tube so as to remove excess inoculum. It was then used for carpet streaking on Mueller Hinton agar plate. The required antibiotic discs were then placed aseptically on this medium using sterile forceps. The plate was then incubated 24 hrs at 37^oc. Next day the zone size was recorded and reported as sensitive or resistant by comparing the zone size to the Kirby-bauer chart.

3. RESULTS :

Out of 1000 various clinical samples culture, were found total 500(50%) gram negative bacilli (Escherichia coli). But, were found total 45 (09%) E.coli from pus swab culture.

tables are showing results:

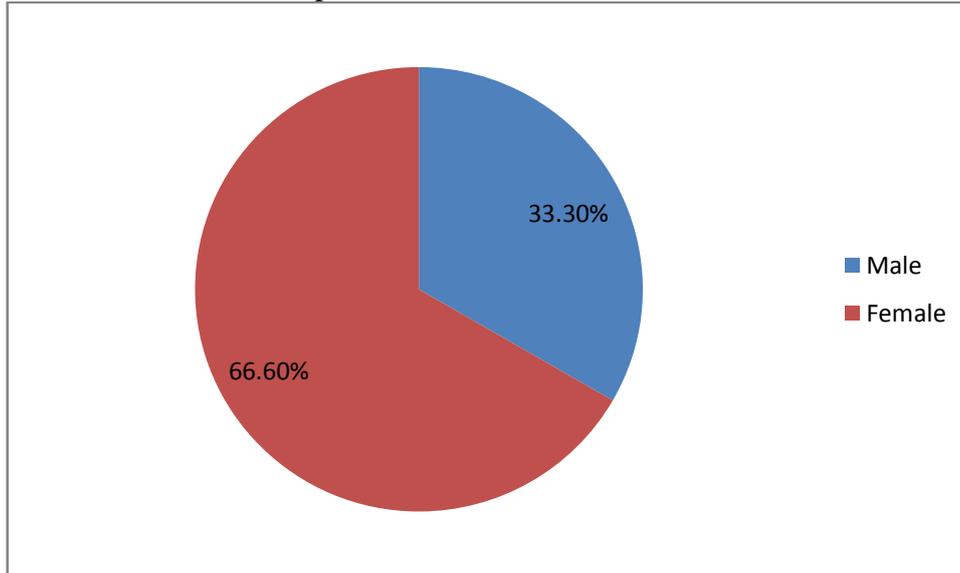
Table.No. 1:- Age Distribution

Age	Case.No.	No.of (%)
01-20	05	11.1
21-40	15	33.3
41-60	10	22.2
61-80	08	17.7
More than 85	07	15.5

Table.No.2 :- Total.No.of positive cases 45(09%) Male& Female.

Total No. of cases Pus Swab Culture	Male	% Male	Female	% Female
45	15	33.30 %	30	66.60 %

Total.No.of positive cases 45(09%) Male&Female .



Antibiotic sensitivity testing (According to CLSI Guidelines).

TABLE NO. 3 :-Total.No.of positive cases 45(09%) E.colifrom pus swab culture & Antibiotic sensitivity pattern:

S.NO.	Antibiotic Disc	S	R
1	AK(30 µg)	30	20
2	AMP(10 µg)	15	30
3	CTX(30 µg)	21	24
4	COT(1.25/23.75 µg)	30	15
5	GEN(10 µg)	25	20
6	DO(30 µg)	35	10
7	CIP(5 µg)	32	13
8	IMP(10 µg)	26	19
9	OF(5 µg)	33	12
10	PIT(100/10 µg)	25	20

4. DISCUSSION:

Escherichia coli is one of the most common causative agents of bacterial infections (12). Antimicrobial resistance patterns of *E. coli* continue to pose a great threat to public health worldwide and lead to serious health problems such as prolonged hospitalization and treatment failure (8, 10). Therefore, this study aimed to detect the antibiotic susceptibility profile of *E. coli* isolates from various clinical sources .

5. CONCLUSION :

Present study shows that the Doxycycline,Ciprofloxacin,Ofloxacin,Co-trimoxazole&Amikacindrugs are highly sensitive.

This study revealed the presence of urine infection causing bacteria,those are capable of causing various human illness.it is concluded that gram-negative bacilli (*Escherichia coli*) are responsible for urinary tract infections and most of the strains were multi-drugs resistant.The most common isolated bacteria from urinary tract infections was *E.coli*.

Antimicrobial susceptibility of microorganisms varies from time to time and from place to place.Hence regular monitoring of bacterial susceptibility to antibiotics is essential.Antibiograms should be prepared regularly and made readily available to the clinicians to guide them in therapy.There is a need for a central database in india where various laboratories can upload their antibiogram regularly and this data can be very useful in formulating guidelines for treatment of various infectious diseases.

High rates of antimicrobial resistance in community-acquired uropathogens have made antimicrobial sensitivity testing necessary even in a rural,primary- care settings (6).

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