Journal of Cardiovascular Disease Research

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 12, 2024

''RAPID DETECTION OF ESBL PRODUCES ISOLATES OF GRAM-NEGATIVE BACILLI IN ENT INFECTION AT A TERTIARY CARE HOSPITAL KANPUR.'

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ABSTRACT

INTRODUCTION: -The spread of ESBL in Gram- negative bacteria represents a major therapeutic challenge either in hospital or in a community setting. Extended spectrum beta-lactamases (ESBL) are typically plasmid – mediated enzymes that confers resistance to extended-spectrum beta lactarium antibiotics such as ceftazidime, cefotaxime, or Aztreonam. ESBLs enzymes produced both Gram positive and gram- negative bacteria but occur predominantly in the family of Enterobacteriales resistant to variety of commonly used ENT microbials produce ESBL.**AIM**: -To study Rapid detection of ESBL produces isolates of Gram- negative bacilli in ENT infection at a tertiary care hospital Kanpur.**MATERIAL & METHODS: -**The present study was conducted in Department of Microbiology and ENT Rama Medical College Hospital and Research Center. Type of study is Cross-sectional observational study. Duration of the study is from November 2024 to November 2024. ENT sample was collected in a sterile swab stick. Culture the sample on Mac conkey & Blood agar and perform all the AST of GNB if the AST is ESBL positive then it was confirmed on culture from chromagar. **RESULT: -** Out of 30 samples, 14 (46.6%) were culture positive on MacConkey and blood agar. The highest isolation rate was observed in the 51-60 yrs age group followed by 61- 70 yrs. The common organisms isolated were *Klebsiella pneumoniae* 8(57.1%), followed by *Pseudomonas aeruginosa* 4(28.5%) and E. coli 2(14.2 %). Sensitivity of *Klebsiella pneumoniae* was Polymyxin (100%), Colistin (100%), Meropenem (90%), Imepenem (85%)of *and resistance were of* Ceftazidime (100%), azetreonam(100%), cefataxime (100%), ceftriaxone (100%). Out of 14(78.5%) sample showed ESBL positive on chrome agar and 3(22.4%) sample didn't grow on chrome agar.**CONCLUSION: -**CHROMagar ESBL seems to be the most reliable method among phenotypic methods for detection of ESBL in the absence of PCR. **KEYWORDS: -**ESBL, CLSI, AST, ENTEROBACTERALES, PCR.

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INTRODUCTION: -

The spread of ESBL in Gram – negative bacteria represents a major therapeutic challenge either in hospital or in a community setting. Extended spectrum beta-lactamases (ESBL) are typically plasmid – mediated enzymes that confers resistance to extended-spectrum beta lactarium antibiotics such as ceftazidime, cefotaxime or Aztreonam[1]. Extended – spectrum beta lactamases are a subset of beta lactamases that confer resistance to penicillin, cephalosporins and batons and less efficiency antagonized by beta -lactamases inhibitors such clavulanate sulbactam[2]. ESBLs enzymes produce both Gram positive and gram-negative bacteria but occur predominantly in the family Enterobacteriaceae resistant to variety of commonly used ENT microbials produced ESBLs[3]. Most ESBL belong to the CTX-M, SHB (sulfhydryl variable) Lemonier) families. Due to the production of multiple enzymes such as the inibitors- resistant ESBLs variants and plasmid-born AmpC, ESBLs phenotypes have become more complex[4]. The spread of ESBLs in gram negative bacteria represents a major therapeutic challenge either in hospitals or in a community setting[5].

Due to the rising of ESBL harboring microorganisms, there has been a worry some increase in the use of carbapenems, and this can result in pan-resistant organism[6]. Hospital and community acquired ESBL producing uropathogens are prevalent worldwide, due to in appropriate use of beta-lactamase antibiotics, poor sanitation in hospitals, and unhealthy lifestyles leading to serious infection and raising therapeutic problems[7]. Extended spectrums beta-lactamases can be readily detected by iodometric, coulometric and chromogenic methods[8]. The use of surveillance culture or of targeted screening for ESBL producers in high- risk patients or units (e.g. in intensive care units) has been advocated to prevent or to control breaks of nosocomial infections caused by these organisms [9,10].

AIM: -

To find out the rapid detection of ESBL roduces isolates of gram-negative bacilli in ENT infection at tertiary care hospital kanpur.

OBJECTIVE: -

1. To isolate gram negative bacilli from ENT infection.
2. To perform the gram staining and biochemicals test for species confirmation.
3. To perform the Kirby bauer methods for AST.
4. To perform the DDST for ESBL detection.

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5. To detect ESBL by chrome agar.

MATERIAL & METHODS:

STUDY SETTING: -

This study wil be conducted in the department of microbiology and department of ENT Rama Medical college Hospital and research Centre Kanpur.

INCLUSION CONCLUSION: -

The patients were diagnosed as suffering after clinical evaluation by an ENT surgeon.

EXCLUSION CRITERIA: -

Patient who has used any local application or any treatment.

METHADOLOGY: -

1. Blood agar
2. MacConkey
3. Chrome agar
4. Muller Hinton agar
5. Bio chemicals

STUDY DESIGN: -

Cross sectional study.

TYPES OF STUDY: -

Observational study.

STUDY PERIOD: -

This study will be conducted from December 2023-December 2024.

RESUT: -

Out of 30 samples, 14 (46.6%) were culture positive on MacConkey and Blood agar. The highest isolation rate was observed in the 51-60 yrs age group followed by 61- 70 yrs. The common organisms isolated were *Klebsiella pneumoniae* 8(57.1%), followed by P*seudomonas aeruginosa* 4(28.5%) and E. coli 2(14.2 %). Sensitivity of *Klebsiella pneumoniae* was Polymyxin (100%),

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Colistin (100%), Meropenem (90%), Imepenem (85%)of *and resistance were of* Ceftazidime (100%), Azetreonam(100%), Cefataxime (100%), ceftriaxone (100%). Out of 14(78.5%) sample showed ESBL (11) positive on chrome agar and (3) sample didn't grow on Chrome agar.

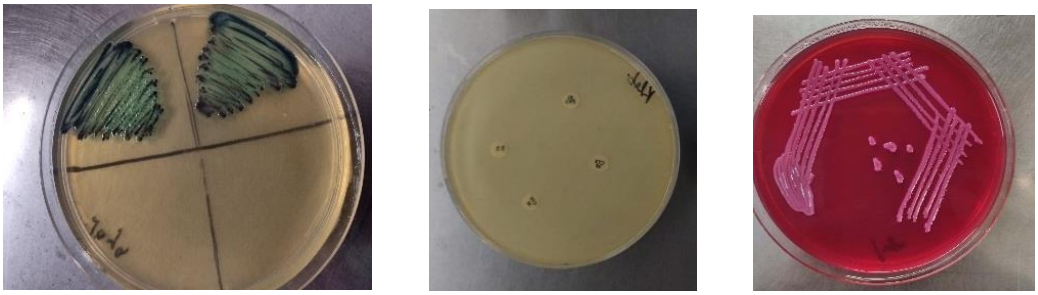

Fig 1 shows :- Klebseilla pneumonia on chrome agar

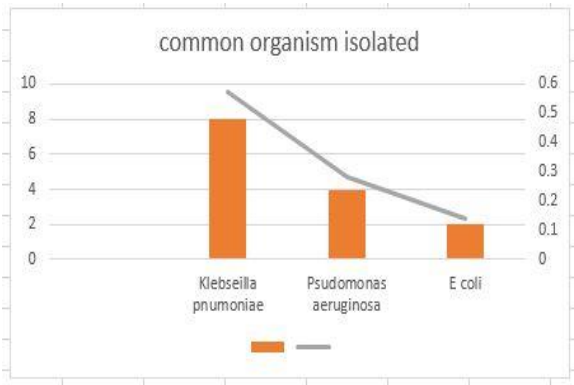

Fig 2 :- Common organism isolated

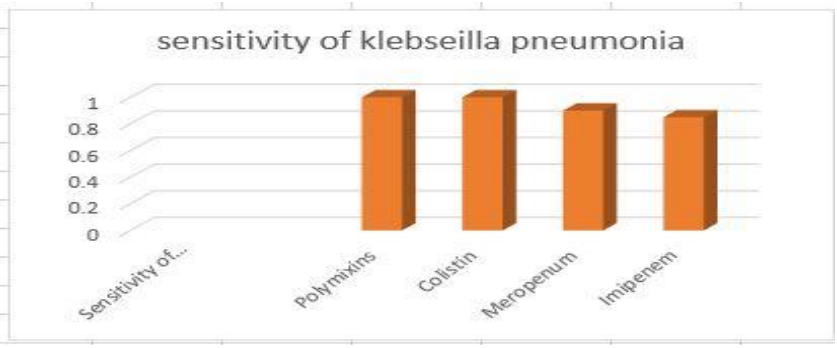

Fig 3 :- sensitivity of klebseilla pneumonia isolates

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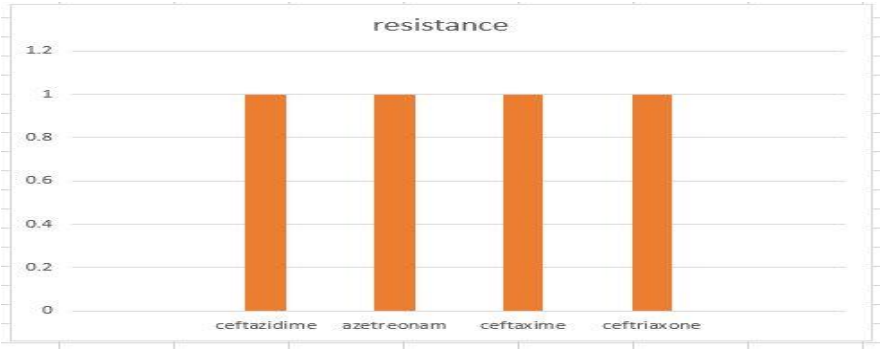

Fig: - Resistance drugs

DISCUSSION: -

In this study isolates show resistant to third generation Cephalosporins, Cefotaxime, Ceftazidime Azetronam and showed sensitivity imipenem and meropenem . This study was carried out to evaluate the performance of double disk synergy test (DDST) and CHROM agar ESBL in screening for ESBL among isolates from pus sample of ENT patient ut of 30 samples, 14 (46.6%) were culture positive on MacConkey and Blood agar. The highest isolation rate was observed in the 51-60 yrs age group followed by 61- 70 yrs. The common organisms isolated were *Klebsiella pneumoniae* 8(57.1%), followed by P*seudomonas aeruginosa* 4(28.5%) and E. coli 2(14.2 %). Also Ezeanya etal reported higher prevalence of 61% from their studies .

CONCLUSION: -

ESBL continues to pose a serious public health threat as it receives attention from the general public, policy makers and clinically microbiologists. Results from our study revealed that CHROMagar ESBL has a high sensitivity and specificity making it reliable for ESBL detection. This medium allows for easy differentiation of different bacteria based on colony colorations. CHROMagar ESBL seems to be the most reliable method among Phenotypic methods for detection of ESBL in the absence of PCR.

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