### ABSTRACT

Objective: To report trends of extended spectrum β-lactamase (ESBL), multidrug resistant (MDR) ESBL and AmpC producing isolates of K. pneumoniae from MGM Hospital, kamothe. Navi Mumbai.

Methods: Multidrug resistance, ESBL & AmpC production was tested by confirmatory methods as per Clinical Laboratory Standard Institute (CLSI) guidelines.

Results:- Out of 1670 sample (urine, pus and ET-secretion) 89(5.32%) klebsiella strain were isolated among them 57(64%) MDR strains resistance to cefotaxime 80%, cefuroxime 80%, tetracycline 78%, cefaperazone 75%,cefazidime 70%. Among these isolates higher prevalence of ESBL and AmpC production was observed in ET-secretion 46.66% and 20% followed by urine 35% and 11.7% and pus 32%.and 8%.

Conclusion:- Detection for the ESBL and AmpC should be carried out as a routine it is simple and cost effective test to improve infections control practices to avoid irrational use of antibiotics and empirical regime should be revisited to prevent further resistance.

### KEYWORDS

MDR, VAP, UTI Wound and Klebsiella species.

### Introduction:
In 1883 Friedlander isolated a capsulated bacillus from the lungs of patient who died of pneumonia. This was named after him as Friedlander’s bacillus. Later on this organism was given the generic name of Klebsiella, which is ubiquitously present and reported worldwide. Strains of Klebsiella are responsible for a wide variety of diseases in humans. These bacteria have become important pathogens in nosocomial infections(1) In addition to being the primary cause of respiratory tract infections like pneumonia, rhinoscleroma, ozaena, sinusitis and otitis, it also causes infections of the alimentary tract like enteritis, appendicitis and cholycystitis. They are frequently associated with the infections of urinary tract, genital tract, and the eyes of patients with diabetes mellitus(2). Extended spectrum β-lactama-

### Materials and Methods:

**Bacterial isolates:** A total of 89 consecutive, non-repeat clinical isolates of a Klebsiella strain was collected from Department of Microbiology, MGM Hospital Kamothe, Navi Mumbai over a period of one year. (Feb 2012 to Feb 2013), both the outpatients and inpatients were included in the study. The isolates were obtained from different clinical specimens such as ET- secretion in case of ventilated associated pneumonia (VAP), 100 microliter of the homogenized sample was added to 100 ml of sterile normal saline definitive diagnosis of VAP, quantitative culture threshold was considered as 10^4 CFU/ml. Growth of any organism below the threshold were assumed to be due to colonization or contamination(3,4). Urine for ‘urine tract infection (UTI) and pus’ for wound cases by bacteriological conventional methods(5).

**Antimicrobial Sensitivity Testing:** The antimicrobial sensitivity test of the isolates was carried out as described by the Kirby – Bauer disc diffusion method on Muller Hinton agar according to CLSI protocols. (16) Isolates were labelled as MDR if they were resistant to at least two classes of first line agents including ampicillin, trimethoprim- sulfamethoxazole, floroquinolones (ciprofloxacin and ofloxacin), gentamicin and cephalosphorins (cephotaxime, ceftriaxone and ceftazidime). (17) The drugs tested were Ampicillin (10μg), amoxicillin clavulanic acid (20 / 10μg), piperacillin (100μg) piperacillin-tazobactam (100/10μg), cefotaxime (30μg), ceftriaxone (30μg), cefazidime (30μg), cefpodoxime (10μg), gentamicin (10μg), amikacin (30μg) ciprofloxacin (5μg), tetracycline (30μg), chloramphenicol (30μg), trimethoprim-sulfamethoxazole (1.25 / 23.75μg) and imipemem (10μg). E. coli ATCC 25922 was used as control strains.

**ESBL detection:** National Committee for Clinical Laboratory Standard (NCCLS) Phenotypic confirmatory combination disc diffusion test. A disc of ceftazidime (30μg) alone and ceftazidime + clavulanic acid (30μg/10) were placed at a distance of 25 mm centre to centre on a MHA plate inoculated with a bacterial suspension of 0.5 McFarland turbidity standards and incubated overnight at 37°C. An increase in inhibition zone diameter of ≥5mm for a combination disc versus ceftazidime disc alone confirmed ESBL producer. Klebsiella pneumoniae ATCC 760063 was used as control strain(18).

**AmpC detection:** All isolates were tested for AmpC β-lactama-

### RESULTS:

<table>
<thead>
<tr>
<th>B.L. Chaudhary</th>
<th>Department of Microbiology, MGM Medical College and Hospital, Sector-18, Kamothe, Navi Mumbai- 410209, Maharashtra, India. * Corresponding author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rakesh Kumar Mukhia</td>
<td>Department of Microbiology, MGM Medical College and Hospital, Sector-18, Kamothe, Navi Mumbai- 410209, Maharashtra, India.</td>
</tr>
<tr>
<td>Rakesh pd sah</td>
<td>Department of Microbiology, MGM Medical College and Hospital, Sector-18, Kamothe, Navi Mumbai- 410209, Maharashtra, India.</td>
</tr>
</tbody>
</table>

### REFERENCES:


Antibiotic showing of ESBL was seen in ET-secretion (25%) followed by wound swabs (13.9%) and urine (9.2%).\(^\text{(26)}\) Laghawe Avinash R. et all. showed 11.7% prevalence of AmpC in Klebsiella species.\(^\text{(26)}\) Table 6 shows that out of 89 Klebsiella isolates the maximum resistance was observed in case pus to cephoxatime 80%, cefaperazone 75% and ceftazidime 70%. Urine was resistance to cefotixozone 70%, tetracycline 78%, ampicillin/subactum 65%. and ET-secretion was cefuroxime 80%, cephoxatime 75% and cefaperazone 66% Savita Jadhav et all. was shown maximum resistance to amoxcillin 82.59% followed by tetracycline 82%, cotrimoxazole 80%, ceftazidime 77.89% cephoxatime 57.97%, gentamicin 53.76%, ciprofloxacin 52.52% amikacin 41.78% and ceftriaxone 41.36%\(^\text{(20)}\).

Table 4) Maximum sensitivity and resistance in MDR Klebsiella strains.

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Antibiotic showing maximum sensitivity (%)</th>
<th>Antibiotics showing maximum resistance (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pus</td>
<td>OF (64%) GEN (60%)</td>
<td>CTX (80%) CPZ (75%)</td>
</tr>
<tr>
<td>Urine</td>
<td>GF (70%) BA (65%)</td>
<td>CI (70%) TE (78%) AS (65%)</td>
</tr>
<tr>
<td>ET-secretion</td>
<td>PF (60%) OF (70%)</td>
<td>CMX (80%) CTX (75%) CPZ (66%)</td>
</tr>
</tbody>
</table>

Conclusion:- Antimicrobial resistance is a global concern not only because it kills but because it increases health costs and threatens patient care. In this study, Klebsiella species was found to be the most predominant isolates as a cause of urinary tract infections, ventilated associated pneumonia and wound infection and also showed a very high prevalence of MDR. In case of wound shows resistance to cefotixozone 80%, urine tract infection, tetracycline 78% and ventilated associated pneumonia, cefuroxime 80%. Among these isolates higher prevalence of ESBL and AmpC production was observed in ET-secretion 46.66% and 20% followed by urine 35% and 11.7% and pus 32%. and 8%. It is concluded that detection for the ESBL and AmpC should be carried out as a routine it is simple and cost effective test. MDR K. pneumoniae play a crucial role in spreading UTI, VAP and wound. Now, it is the need to improve infections control practices, avoid irrational use of antibiotics and empirical regime should be revisited to prevent further resistance.
REFERENCES

29. Laghve Avinah et all. The simultaneous de