MICU CLINICAL ANTIBIOGRAM

Dept. of General Medicine
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What Is a Clinical Antibiogram?

Summarizes antimicrobial susceptibility, right ID diagnosis, and clinical response data for bacterial isolates recovered by a microbiology laboratory over a defined period (Last 3 months, Aug- Oct 2023)

WHY ANTIBIOGRAM IS REQUIRED?

- *For the clinician*
  - Deciding empirical therapy, while waiting for C/S reports
  - Provides knowledge on prevalence of most common pathogens
  - Provides guidance which therapy to choose in MDR, XDR, PDR pathogens
- *For the microbiologist*
  - Helps in antibiotic resistance monitoring and infection control
- *For the administrator*
  - Policy formulation
  - Optimizing resources

COMPONENTS OF ANTIBIOGRAM

1. Time frame: 3 months
2. Name of the facility: Dept of General Medicine
3. Methodology: Ahead
4. List of organisms: Ahead
5. Number of isolates analyzed: 30 (Acinetobacter baumanii)
6. List of antibiotics: Ahead
7. Percent susceptibility (range 0-100%): Ahead

STEPS IN PREPARATION OF ANTIBIOGRAM

STEP 1: Data Collection

a. Define and select target population (e.g.- Area wise (MICU), Disease wise (Ventilator-associated pneumonia)

b. Obtain culture and sensitivity data from the patient's records and/ or microbiological data (retrieved from Dept of Microbiology)

(at least 30 samples are required for each organism per disease)

STEP-2: Clinical response identification per patient

A. Response based on empirical antibiotic use?
    i. Yes: First Line antibiotic for the disease, Excel it
    ii. No: Move to the Step 2B.

B. Response based on culture-guided antibiotic?
    i. Yes: Add to the Excel sheet
    ii. No: Exclude the patient

STEP-3: Excel data

- Chart the data in percentage values (Percentage susceptibility)

Note: Incorporate the patients who have responded to either empirical or culture-based therapy for making a clinical antibiogram

STEP-4: Analysis

- Compile and analyze the gathered data
- Sample Excel Sheet for clinical antibiogram to VAP patient

DOA	NAME	AGE	UHID	ONSET OF SYMPTOMS (SOB+ FEVER) AFTER HOSPITALIZATIO N	HOSPITALIZED FOR MORE THAN 48 HOURS	XRAY FINDINGS	ORGANISM ISOLATED IN RESPIRATORY C/S	EMPERICAL ANTIBIOTIC	CULTURE SENSITIVE ANTIBIOTIC STARTED	condition improved after empirical antibiotic	CONDITION IMPROVED AFTER STARTING CULTURE SENSITIVE ANTIBIOTIC	FINAL DIAGNOSIS
20-07-2023	priyanka	22	20230099868	YES	YES	LOCALIZED INFILTRATES	ACENITOBACTER BAUMANII	MEROPENEM	NOT STARTED	YES	NA	POST LSCS SEPSIS (PERPUERAL SEPSIS) WITH MODS
18-08-2023	Ekta	18	20230090162	YES	YES	DIFFUSE INFILTRATES	Acinetobacter Baumanni	MEROPENEM, LEVOFLOXACIN	inj colistin	no	yes	TBM with communicating hydrocephalus with tuberculosis, VAP Acinetobacter
18-06-2023	KRISHNA	45	20230083444	YES	YES	LOCALIZED INFILTRATES	Acinetobacter baumanni	Inj Ceftriaxone	inj meropenem	no	yes	ACUTE MENINGOENCEPHALITIS WITH T2DM WITH VAP
28-06-2023	Shruti	19	20230070404	YES	NO	LOCALIZED INFILTRATES	ACENITOBACTER BAUMANII	INJ PIPERACILLIN TAZOBACTAM	INJ COLISITN	no	YES	CKD (FSGS) WITH VAP
21-07-2023	sanjay sharma	45	20180226582	YES	YES	DIFFUSE INFILTRATES	E.coli	MEROPENEM	Inj Colisitjn	no	yes	hemorrhagic cva systemic htn. CKD 5d VAP
16-07-2023	KAUSHIK CHAUHAN	22	20230096520	YES	YES	DIFFUSE INFILTRATES	Acinetobacter Baumanni	INJ PIPERACILLIN TAZOBACTAM, INJ AZITHROMYCIN	INJ COLISITN AND TAB COTRIMOXAZOLE	NO	YES	DKA, Community Acquired pneumania with left lower lobe cllapse, Young onset DM, Acute kidney disease
18-07-2023	KANNU	65	20230098607	NO	YES	LOCALIZED INFILTRATES	Pseudomonas aeruginosa	INJ PIPERACILLIN TAZOBACTAM, INJ AZITHROMYCIN	INJ PIPERACILLIN TAZOBACTAM	YES	NA	CAP- CURB = 3, TYPE 2 RESPIRATORY FAILURE, COPD, TYPE 2 DM
25-06-2023	VIMLA	56	20230068274	NO	YES	LOCALIZED INFILTRATES	Acinetobacter Baumanii	MEROPENEM, LEVOFLOXACIN	NOT STARTED	YES	NA	DM WITH COMPLICATIONS WITH LRTI WITH VAP
2023.08.11	Vidya	26/F	20230073483	NO	YES	DIFFUSE INFILTRATES	Pseudomonas aeruginosa	INJ PIPERACILLIN TAZOBACTAM	INJ COLISTIN	NO	YES	REFRACTORY ACTUE RESPIRATORY DISTRESS SYNDROME (ARDS) REFRACTORY SEPTIC SHOCK ORGANISING PNEUMONIA GRADE-III BED SORE DIFFUSE ALVEOLAR HEMORRHAGE (DAH) MAJOR ORGAN SYSTEMIC LUPUS ERYTHEMATOUS (SLE:- NEUROPSYCHIATRIC LUPUS, HEMATOLOGICAL, PULMONARY, SKIN)

MICU LABORATORY ANTIBIOGRAM (RESPIRATORY/ URINE/ BLOOD CULTURES)

- Most common MDR pathogen: Acinetobacter baumanii (n=127)

ACINETOBACTER BAUMANII		
Sr No.	ANTIBIOTIC	SUSCEPTIBILTY %
1	COLISTIN	96.36
2	MINOCYCLINE	42.8
3	COTRIMOXAZOLE	26.31
4	GENTAMYCIN	7.3
5	IMIPENEM	5.45
6	LEVOFLOXACIN	5.1
7	CIPROFLOXACIN	4.1
8	MEROPENEM	3.9
9	CEFTAZIDIME	3.7
10	CEFEPIME	1.9
11	AMIKACIN	1.18
12	PIPERACILLIN TAZOBACTAM	0.99

MICU LABORATORY ANTIBIOGRAM (RESPIRATORY/ URINE/ BLOOD CULTURES)

- 2nd Most common GN MDR pathogen: Klebsiella pneumoniae (n=68)

KLEBSIELLA PNEUMONIAE		
Sr No.	ANTIBIOTIC	SUSCEPTIBILTY %
1	COLISTIN	100
2	MINOCYCLINE	100
3	CEFTAZIDIME-AVIBACTAM	100
4	TIGECYCLINE	80
5	IMIPENEM	10
6	AZTREONAM	10
7	CIPROFLOXACIN	10
8	ERTAPENEM	10
9	GENTAMYCIN	9
10	PIPERACILLIN TAZOBACTAM	7.8
11	MEROPENEM	6
12	CEFEPIME	1.6
13	CEFUROXIME	0
14	COTRIMOXAZOLE	0
15	CEFTRIAXONE	0
16	LEVOFLOXACIN	0

MICU LABORATORY ANTIBIOGRAM (RESPIRATORY/ URINE/ BLOOD CULTURES)

- 3rd Most common MDR pathogen: Pseudomonas aeruginosa (n=60)

PSUEDOMONAS AEROGINOSA		
Sr No.	ANTIBIOTIC	SUSCEPTIBILTY %
1	COLISTIN	98
2	AMIKACIN	80
3	AZTREONAM	66
4	CEFEPIME	66
5	CEFTAZIDIME	50
6	COTRIMOXAZOLE	50
7	FOSFOMYCIN	50
8	CEFTAZIDIME-AVIBACTAM	50
9	PIPERACILLIN TAZOBACTAM	40
10	MEROPENEM	33
11	IMIPENEM	30
12	CEFTRIAXONE	20
13	DORIPENEM	16
14	CIPROFLOXACIN	12
15	ERTAPENEM	10
16	CEFUROXIME	8

MICU LABORATORY ANTIBIOGRAM
(RESPIRATORY/ URINE/ BLOOD CULTURES)

- 4th Most common GN MDR pathogen: Escherichia coli (n=49)

E. COLI		
Sr No.	ANTIBIOTIC	SUSCEPTIBILTY %
1	COLISTIN	100
2	FOSFOMYCIN	100
3	MINOCYCLINE	100
4	TIGECYCLINE	100
5	AMIKACIN	68
6	GENTAMYCIN	64
7	IMIPENEM	50
8	ERTAPENEM	38
9	MEROPENEM	21
10	PIPERACILLIN-TAZOBACTAM	20
11	COTRIMOXAZOLE	14
12	CEFUROXIME	0
13	AZTREONAM	0
14	CEFTRIAXONE	0
15	CEFTAZIDIME	0
16	CIPROFLOXACIN	0

MICU LABORATORY ANTIBIOGRAM (RESPIRATORY/ URINE/ BLOOD CULTURES)

- Most common Gram Positive MDR pathogen: Methicillin-resistant Coagulase negative Staphylococci (n=48)

MRCONS	
Antibiotic	Susceptibilty %
Vancomycin	100
Teicoplanin	92
Linezolid	80
Tigecycline	100
Daptomycin	100
Tetracycline	64
Cotrimoxazole	35
Clindmycin	15

MICU LABORATORY ANTIBIOGRAM (POCKETGUIDE)

FROM AUGUST 2023- OCTOBER 2023

Organism	Total Number of Isolates seen (Blood, Urine and Respiratory)	Piperacillin-tazobactam	Meropenem	Aztreonam	Cotrimoxazole	Cefepime	Amikacin	Colistin	Ceftriaxone	Imipenem	Ceftazidime	Gentamicin	Ciprofloxacin	Levofloxacin	Tigecycline	Minocycline	Fosfomycin	Ceftazidime\avibactam
(PERCENTAGE SUSCEPTIBILITY \ NUMBER OF ISOLATES TESTED)																		
Acinetobacter baumanii	127	0.99\101	3.9\101	N.A.	26.31\95	1.9\101	1.18\110	96.36\110	0\25	5.45\110	3.7\108	7.3\95	4.1\96	5.1\86	N.A.	41.8\86	N.A.	N.A.
Escherichia coli	49	20\49	21\48	0\2	14\49	8 (SDD)\48	68\49	100\49	0\49	50\49	0\10	64\49	0\49	0\4	100\5	100\4	100\4	N.A.
Klebsiella pneumoniae	64	7.8\64	6\64	10\40	0\10	1.6\60	10\50	97.8\64	0\50	10\60	N.A.	9\40	10\40	0\4	80\5	100\1	0\2	100\1
Pseudomonas aeruginosa	66	40\60	33\60	66\30	50\60	66\60	80\30	98\60	20\60	30\60	50\40	N.A.	12\60	30\40	N.A.	N.A.	50\2	50\2

Organism	Total Number of Isolates seen (Blood, Urine and Respiratory)	Cotrimoxazole	Linezolid	Ciprofloxacin	Penicillin	Tetracycline	Gentamycin	Tigecycline	Doxycycline	Levofloxacin	Gentamycin High-dose	Teicoplanin	Fosfomycin	Cefoxitin	Clindamycin	Chloramphenicol	Nitrofurantoin	Erythromycin	Vancomycin	Daptomycin
MR-CONS	48	35\48	80\48	4\48	2\48	64\48	65\48	100\5	0\5	6\48	100\3	92\25	0\2	7\38	15\48	100\3	100\7	4\48	100\48	100\40
MRSA	4	24\1	100\4	0\4	0\4	100\4	75\4	N.A.	N.A.	0\4	N.A.	N.A.	N.A.	0\4	25\4	N.A.	100\1	0\4	100\4	100\4
Enterococcus faecium	12	N.A.	50\12	0\12	0\12	0\12	N.A.	100\6	N.A.	0\12	0\6	8\12	N.A.	N.A.	N.A.	N.A.	0\2	0\12	16\12	100\4

LEGEND

HIGHLY SUSCEPTIBLE (>80%)

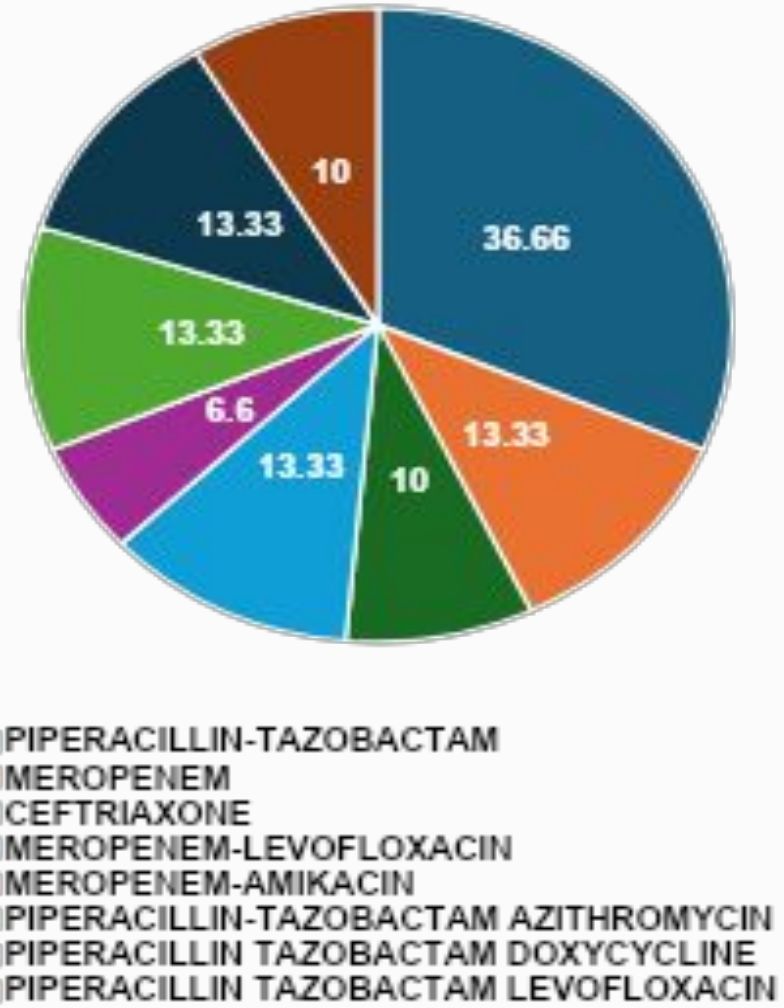
MODERATELY HIGH SUSCEPTIBLE (60-80%)

LESS SUSCEPTIBLE (<60%)

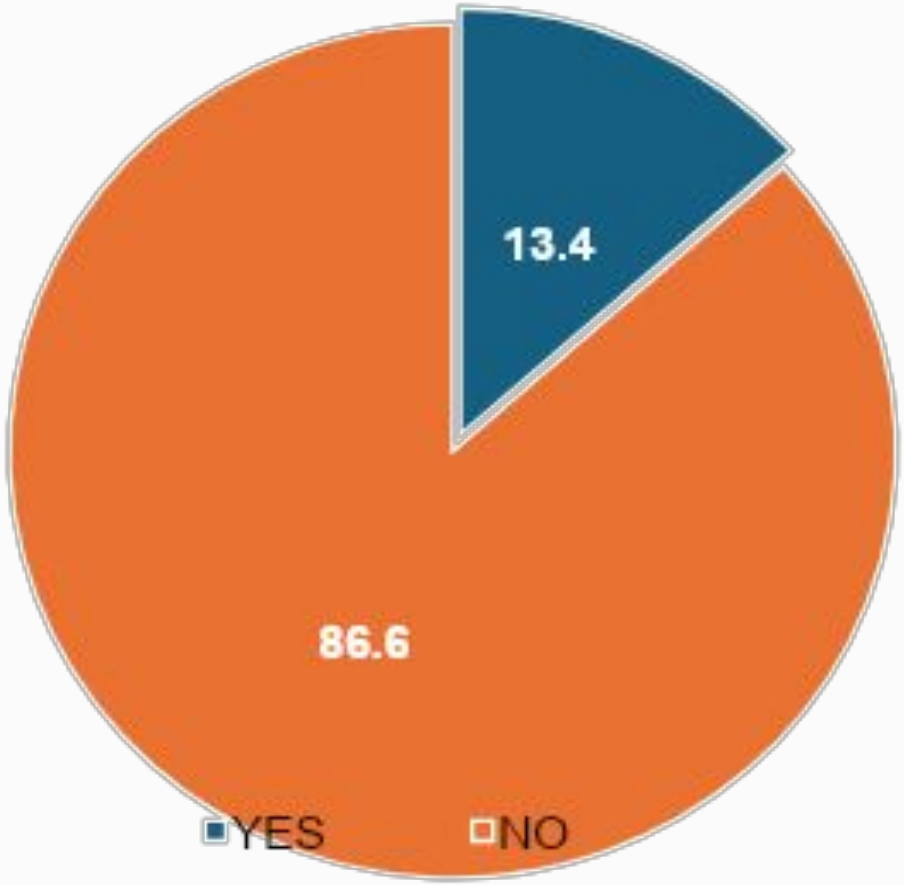
NOT AVAILABLE

PREPARED BY- DR SAHIL, DR CHACKAPPEN, DR PRASAN K PANDA, DEPT OF GENERAL MEDICINE AND DR VANYA SINGH, DEPT OF MICROBIOLOGY AIIMS RISHIKESH, DATED 18TH NOVEMBER 2023

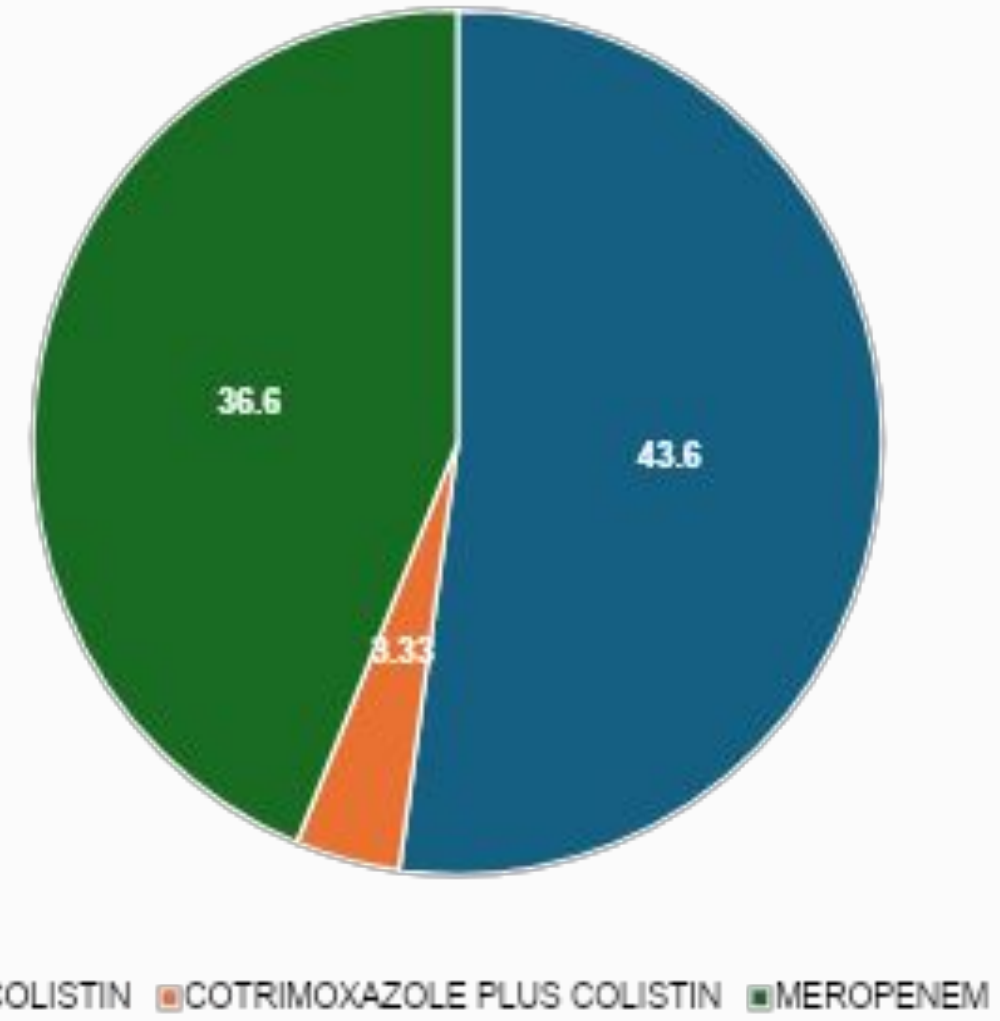
EMPIRICAL ANTIBIOTICS GIVEN IN PATIENTS WITH VAP WHICH LATER SHOWED A GROWTH OF ACINETOBACTER BAUMANII (N=30)



PERCENTAGE OF PATIENTS SHOWING CLINICAL IMPROVEMENT AFTER EMPERICAL ANTIBIOTIC



PATIENTS WHICH IMPROVED WITH CULTURE SENSITIVE ANTIBIOTICS



NOTE: PRIMARY ENDPOINT WAS THE IMPROVEMENT OF THE PATIENT

MICU CLINICAL ANTIBIOGRAM (POCKETGUIDE)

FROM AUGUST 2023- OCTOBER 2023

PERCENTAGE SUSCEPTIBILITY															
DISEASE	ORGANISM	Piperacillin-tazobactam	Meropenem	Cotrimoxazole	Amikacin	Colistin	Ceftriaxone	Imipenem	Ceftazidime	Gentamicin	Ertapenem	Ciprofloxacin	Levofloxacin	Tigecycline	Minocycline
(PERCENTAGE SUSCEPTIBILITY \ NUMBER OF ISOLATES TESTED)															
HAP/ VAP	Acinetobacter baumanii (MC)	0/30	46.66/30*	3.33/30	0/30	46.67/30	3/30*	0/30	0/30	0/30	0/30	0/30	6.6/30	Sensitive but not given	Sensitive but not given

Note: * Marked antibiotics can be given as empirical antibiotics for VAP as clinically responded, but only when susceptible ones are not available/contraindicated

LEGEND	HIGHLY SUSCEPTIBLE (>80%)	MODERATELY HIGH SUSCEPTIBLE (60-80%)	LESS SUSCEPTIBLE (<60%)	NOT AVAILABLE

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