



## ANTIBIOTIC PROFILE OF *BURKHOLDERIA CEPACIA* IN TERTIARY CARE HOSPITAL, VADODARA, GUJARAT, INDIA.

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**ABSTRACT** Since the early 1980's, *Burkholderia cepacia* emerged as a causative agent of opportunistic human infections. *Burkholderia cepacia* (*B. cepacia*) is an opportunistic pathogen which causes severe infections in patients with underlying diseases, such as cystic fibrosis (CF) or chronic granulomatous disease (CGD). *B. cepacia* causes nosocomial bloodstream infections in non-CF patients with a mortality rate of 25%–64%. Several severe infections caused by *B. cepacia* have been reported in children e.g. sepsis, pneumonia, CNS infections, and urinary tract infections. This prospective analysis was done in tertiary care hospital in Vadodara during the period of January - June 2023. 17 non-duplicate *Burkholderia cepacia* were recovered from samples. Out of 17 *Burkholderia cepacia* isolates, 12 isolates are most sensitive to Meropenem (70.59%), Ceftazidime (52.94%), Trimethoprim/Sulphamethoxazole (47.06%), Cefoperazone/ Sulbactam (29.41%), Imipenem (23.53%), Minocyclin (23.53%), Piperacillin/Tazobactam (17.65%), Cefepime (17.65%), Ciprofloxacin (17.65%), Levofloxacin (17.65%), Aztreonam (5.88%) and, Tigecycline (0%).

**KEYWORDS** : *Burkholderia cepacia*, Antibiotic sensitivity testing.

### INTRODUCTION:

*Burkholderia cepacia* is highly virulent and multidrug resistant pathogen that causes fatal and serious infections in ICUs that leads to rise in mortality and morbidity [1]. Since the early 1980s, *Burkholderia cepacia* emerged as a causative agent of opportunistic human infections[2]. *Burkholderia cepacia* (*B. cepacia*) is an opportunistic pathogen which causes severe infections in patients with underlying diseases, such as cystic fibrosis (CF) or chronic granulomatous disease (CGD)[3,4]. *B. cepacia* causes nosocomial bloodstream infections in non-CF patients with a mortality rate of 25%–64% [3, 5]. Several severe infections caused by *B. cepacia* have been reported in children e.g. sepsis, pneumonia, CNS infections, and urinary tract infections [6,7].

### MATERIALS AND METHODS:

This prospective analysis was done in tertiary care hospital in Vadodara during the period of January - June 2023. 17 non-duplicate *Burkholderia cepacia* were recovered from samples such as urine, pus, sputum, wound swab, ear swab, blood, endotracheal aspirate from various departments of Smt. B. K. Shah Medical Institute and Research Centre (Table 1). The clinical samples were inoculated by streak plate method on nutrient agar (Himedia, Mumbai, India), Mac Conkey agar (Himedia, Mumbai, India) and blood agar (Himedia, Mumbai, India). Blood was inoculated in BACTEC automated machine and positive cultures were plated on blood agar, Mac Conkey agar and nutrient agar. The isolated colonies on the different media were identified based on the morphology of the colony, Gram staining, oxidase test and confirmed identification was done in VITEK 2 automated machine. VITEK 2 also gave us antibiotic profile of the bacterium in all samples. All the media, oxidase disc, Gram staining kit purchased from Himedia, Mumbai, India.

### RESULTS:

17 *Burkholderia Cepacia* were isolated from 221 different samples. The prevalence rate of the organism was found to be 7.69%. (which is comparable to study done by Usham G et al where prevalence was 7.9%). 10 (58.82%) isolates were from males and 7 (41.18%) from females. (whereas in study done by Waaleed et al *Burkholderia cepacia* was isolated in 79.2% males and 20.8% females.)

**Table 1: Distribution Of Isolates According To Type Of Specimen:**

Type of specimen	No. of isolates (%)
Blood	8 (47.06%)
Pus	5 (29.41%)
Sputum	1 (5.88%)
Urine	3 (17.65%)
Total	17 (100%)

Table 1 shows that out of 17 isolates, 8 (47.06%) of the isolates were from blood, 5 (29.41%) were from pus, 3 (17.65%) were from urine and 1 (5.88%) were from sputum.

**Table 2: Distribution Of Isolates According To Department Of**

### Hospital From Where The Sample Has Been Received:

Department of Hospital	No. of isolates
ICU	8 (47.06%)
Surgery	1 (5.88%)
Medicine	3 (17.65%)
Orthopedics	1 (5.88%)
Obstetrics and Gynecology	2 (11.76%)
Emergency	2 (11.76%)
total	17 (100%)

Table 2 shows that 8 (47.06%) of strains were isolated from the samples sent from ICU followed in decreasing order by 3 (17.65%) from Medicine Department, 2 (11.76%) from Obstetric & Gynecology Department and Emergency each, 1 (5.88%) from Orthopedic Department & Surgery Department each.

**Table 3: Distribution Of Isolates According To Their Antibiotic Sensitivity Pattern:**

Antibiotic	Short form	No. of isolates	Percent age
PIPERACILLIN/TAZOBACTAM	PIT	3	17.65%
CEFTAZIDIME	CAZ	9	52.94%
CEFOPERAZONE/SULBACTAM	CFS	5	29.41%
CEFEPIME	CPM	3	17.65%
AZTREONAM	AT	1	5.88%
IMIPENEM	IPM	4	23.53%
MEROPENEM	MRP	12	70.59%
CIPROFLOXACIN	CIP	3	17.65%
LEVOFLOXACIN	LE	3	17.65%
MINOCYCLIN	MI	4	23.53%
TIGECYCLINE	TGC	0	0%
TRIMETHOPRIM/SULPHAMETHOXAZOLE	COT	8	47.06%
Total		17	

Table 3 shows that out of 17 isolates, 12 isolates are most sensitive to Meropenem (70.59%), Ceftazidime (52.94%), Trimethoprim/Sulphamethoxazole (47.06%), Cefoperazone/Sulbactam (29.41%), Imipenem (23.53%), Minocyclin (23.53%), Piperacillin/Tazobactam (17.65%), Cefepime (17.65%), Ciprofloxacin (17.65%), Levofloxacin (17.65%), Aztreonam (5.88%) and Tigecycline (0%).

### DISCUSSION:

Out of 17 isolates, Maximum number of patients e.g. 8 (47.08%) were from ICU which is comparable to study done by Shukla R et al [2] and Dizbay et al [8]. Similarly, maximum e.g. 8 (47.06%) of the isolates were from blood which is similar to study done by Usham G et al [1]. Number of isolates were more in male patients as compared to female patients which is comparable to study done by Usham G et al [1]. *B. cepacia* is most sensitive to Meropenem. Similar observation can also be seen in study of Usham G et al [1] and Shi H. et al [3].

### CONCLUSION:

*Burkholderia cepacia* is a nosocomial agent with high mortality and

poses a real threat to critically ill and immunocompromised patients and needs prompt treatment. A problem of multidrug resistance makes *B. cepacia* a clinical treatment challenge. Therefore, it is very necessary to monitor *B. cepacia* infections, including changing epidemiology and increasing resistance. A favorable prognosis can be achieved by monitoring infections and using effective antibiotics such as, meropenem, ceftazidime, trimethoprim-sulfamethoxazole. Meropenem is most effective drug in our hospital setting. Hospital infection control committee and antibiotic stewardship committee can play a major role in preventing these infections.

#### Acknowledgements:

The author is thankful to the faculty and technical assistance staff of Central laboratory, Department of Microbiology, SBKS MI & RC, Vadodara, India for their support.

**Author's Contribution:** The author has made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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