ORIGINAL RESEARCH

Retrospective study on prevalence of Bacterial isolates from patients of Blood Stream Infection admitted in a tertiary care center

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ABSTRACT

Introduction: Bloodstream Infections (BSIs) pose a significant threat to global public health, contributing substantially to morbidity and mortality rates. Despite advancements in antimicrobial therapy, the emergence of antibiotic-resistant strains complicates treatment strategies. Understanding the prevalence and antimicrobial Sensitivity patterns of bacterial isolates causing BSIs is crucial for guiding empirical antibiotic therapy and combating antimicrobial resistance. **Materials & Methods:** This retrospective study analyzed data from patients admitted to a tertiary care center with documented BSIs. Blood samples collected over an 18-month period were processed for microbial culture and antimicrobial Sensitivity testing. The study population included inpatient department cases with positive blood cultures. Bacterial isolates were identified, and Sensitivityresults were determined using standardized laboratory protocols. **Results:** Among 1257 blood samples analyzed, 375 tested positive for bacterial infection, indicating a significant prevalence(29.8%) of BSIs. Coagulase Negative Staphylococci (21.95%), Klebsiella pneumoniae (17.89%), Acinetobacter spp. (13.41%) and Staphylococcus aureus (7.11%) were the most prevalent isolates. The sensitivity results across various antibiotics reveal a range of sensitivities among different bacterial species. Notably, Klebsiella pneumoniae, Staphylococcus aureus, and Acinetobacter species displayed variable sensitivity results. For instance, Escherichia coli exhibited low Sensitivity to several antibiotics, with higher rates for amikacin and gentamicin. Enterobacter spp. showed moderate Sensitivity, especially to trimethoprim/sulfamethoxazole and carbapenems. Serratia spp. exhibited moderate to high sensitivity to ciprofloxacin but lower Sensitivity to nalidixic acid. Citrobacter spp. showed varying Sensitivity, with higher sensitivity to piperacillin/tazobactam. The carbapenems, including imipenem, meropenem, and ertapenem, displayed consistent sensitivity rates across different bacterial species. Additionally, Salmonella Typhi maintained a consistent Sensitivity profile across a broad spectrum of antibiotics. However, continued monitoring of antibiotic resistance patterns remains crucial to ensure effective management and mitigate the risk of resistance development. Raoultella species displayed notable variations in sensitivity, with chloramphenicol and tigecycline showing high efficacy but lower rates observed for other antibiotics. **Discussion:** The findings underscore the persistent burden of BSIs and highlight the challenge of antimicrobial resistance. Gender and age disparities in infection prevalence were observed, emphasizing the need for tailored interventions. Comparison with existing literature revealed similarities in predominant pathogens and resistance profiles, emphasizing the importance of evidence-based interventions and collaborative efforts. **Conclusion:** This study provides valuable understandings into the antimicrobial resistance in Organisms cultured in BSIs, guiding empirical antibiotic therapy and infection control strategies. Continued surveillance and research are essential for addressing the evolving threat of antimicrobial resistance and improving patient outcomes in BSIs.

Keywords: Bloodstream infection, Bacterial isolates, Antimicrobial Sensitivity, Epidemiology, Antimicrobial resistance, Empirical antibiotic therapy.

INTRODUCTION

Bloodstream Infections (BSIs) represent a significant global health challenge, contributing substantially to morbidity and mortality rates worldwide [1]. Normally, the bloodstream is sterile, but when bacteria invade, leading to bacteremia, it can result in severe conditions such as sepsis. Sepsis is characterized by a range of clinical symptoms, including fever, chills, tachycardia, and organ dysfunction, posing a serious threat to patient health [2]. Prior to the advent of antibiotics, mortality rates from bacteremia were alarmingly high, but with the introduction of antimicrobial therapy, mortality rates have decreased, albeit with rising concerns about antimicrobial resistance [3]. While gram-negative bacteria containing endotoxins were traditionally associated with sepsis, it's now recognized that gram-positive bacteria can also lead to sepsis syndrome. The most commonly isolated pathogens from bloodstream cultures include Escherichia coli, Staphylococcus aureus, Klebsiella pneumoniae, and Enterococci, many of which are believed to be acquired in healthcare settings [4]. Factors such as medical conditions, invasive procedures like catheterization, and intravenous treatment increase Sensitivity to bloodstream infections. Bacteriological cultures remain essential for identifying the causative pathogens and their antibiotic Sensitivityresults, which are crucial for effective management. However, the increasing prevalence of antibiotic-resistant strains complicates treatment decisions. Understanding the prevalent bacterial strains and their resistance patterns is vital for guiding empirical antibiotic therapy until culture results are available [5].

MATERIALS & METHODS

This retrospective study aims to investigate the bacteriological profile of Bloodstream Infections and analyze the antibiotic sensitivity profile. By establishing local antibiotic data, this research aims to facilitate informed decisions regarding empirical antibiotic therapy and contribute to the formulation of effective antibiotic policies. Furthermore, insights into antibiotic resistance patterns will inform epidemiological understanding and guide efforts towards infection control measures to mitigate the spread of drug resistance. Ultimately, this study endeavors to provide valuable information to clinicians, enabling them to judiciously prescribe antibiotics and implement rigorous infection control strategies, thus combating the growing threat of antimicrobial resistance and improving patient outcomes. The research adopts a retrospective approach, focusing on the prevalence of bacterial isolates among patients admitted with Blood Stream Infection (BSI) at a tertiary care center. Utilizing a cross-sectional study design, data is collected over an 18-month period from January 2018 to June 2019 at the Department of Microbiology, Chirayu Medical College & Hospital, Bhopal. The study population includes inpatient department (IPD) cases with documented blood cultures conducted during the specified timeframe. 1257Blood samples collected for aerobic culture and sensitivity testing are analyzed, with inclusion criteria encompassing samples processed according to standardized procedures. Antibiotic sensitivity testing was performed using the Kirby-Bauer disk diffusion method& Automation Method i.e. by using Vitek-2 Compact (Biomerieux).Exclusion criteria ensure the exclusion of samples other than blood to maintain data consistency. As a retrospective study, no new sample collection was involved, relying solely on existing data captured during routine clinical practices. The collected data was subjected to meticulous analysis, examining variables such as patient demographics, culture methodology, percentage positivity of blood cultures, prevalence and distribution of bacterial isolates, and antibiogram profiles. This comprehensive approach aims to provide valuable insights into antimicrobial resistance patterns among BSI patients, facilitating the development of informed therapeutic strategies.

RESULTS

Table 1: Percentage Positivity

Total No. of Samples	Positive Samples	% Positivity
1257	375	29.8%

Table 1 illustrates the percentage positivity of blood samples for bacterial isolates in the study. Out of a total of 1257 blood samples analyzed, 375 tested positive for bacterial infection, resulting in a positivity rate of 29.8%. This indicates a significant prevalence of bloodstream infections among the patient population studied.

Table 2: Gender Wise Distribution of Positive Samples

Gender	No. Of Patients
Male	209
Female	166

Table 2 presents the gender-wise distribution of positive samples among the patients with bloodstream infections. Among the positive samples, 209 were from male patients, while 166 were from female patients. This distribution indicates that bloodstream infections were slightly more prevalent among male patients in the study population.

Table 3: Age Wise Distribution of Positive Samples

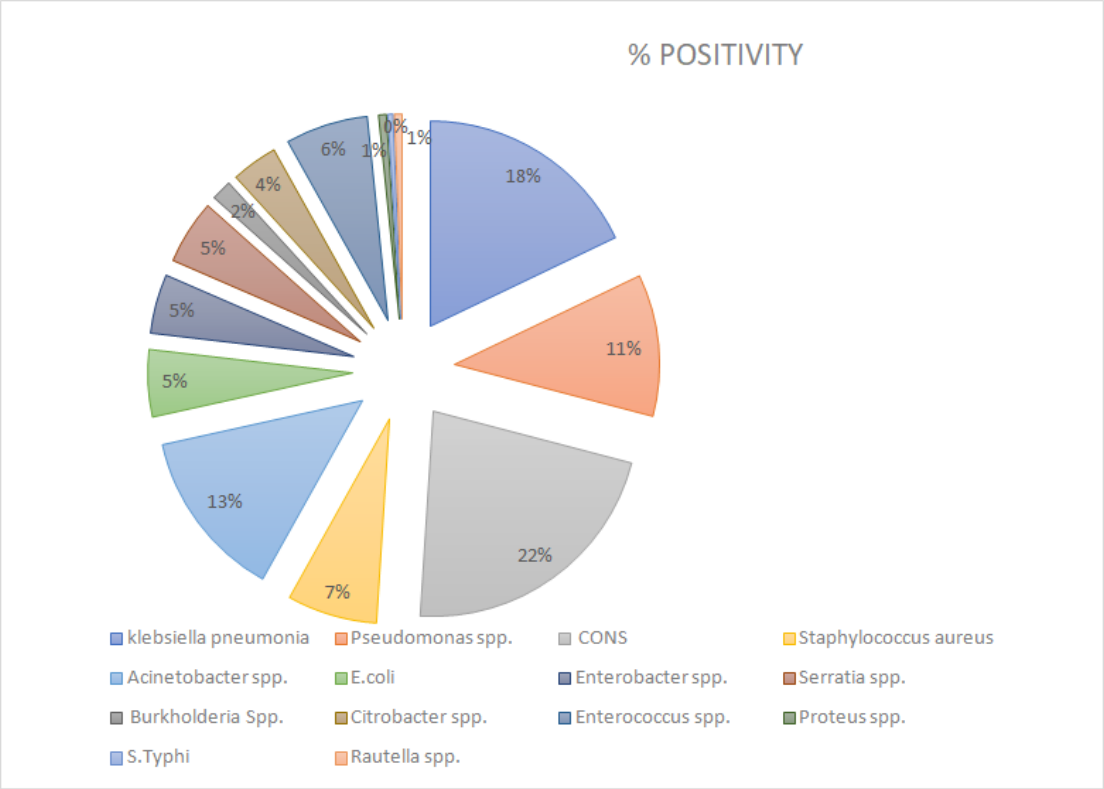
Age (Years)	No. Of Patients
<10	26
11-20	17
21-30	22
31-40	48
41-50	67
51-60	107
61-70	46
>70	42

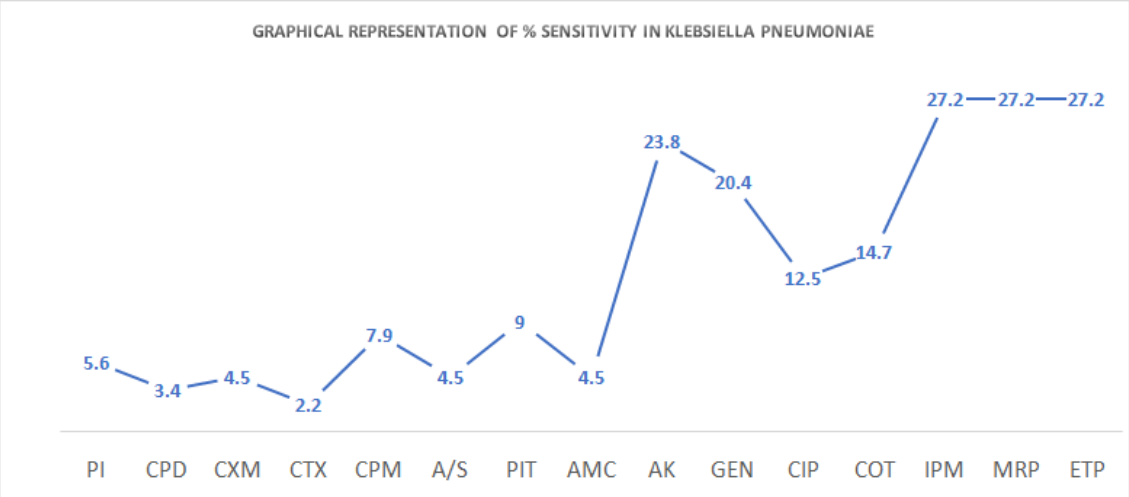
Table-4: Distribution of Organism Isolated

S.N.	Organism Isolated	% Positivity
1.	Klebsiella pneumoniae	17.89
2.	Pseudomonas aeruginosa	11.18
3.	Coagulase Negative Staphylococci	21.95
4.	Staphylococcus aureus	7.11
5.	Acinetobacter spp.	13.41
6.	Escherichia coli	5.28
7.	Enterobacter spp.	4.67
8.	Serratia spp.	5.08
9.	Burkholderia Spp.	1.63
10.	Citrobacter spp.	3.66
11.	Enterococcus spp.	6.50
12.	Proteus spp.	0.61
13.	Salmonella Typhi	0.41
14.	Rautella spp.	0.61

Table 3 depicts the age-wise distribution of positive samples among patients with bloodstream infections. The data shows that the majority of positive samples were observed in patients aged 51-60 years, with 107 cases. This age group is followed by patients aged 41-50 years, with 67 cases, and those aged 61-70 years, with 46 cases. The distribution of positive samples decreases in patients younger than 40 years, with the lowest number of cases observed in the 11-20 years age group. Additionally, there were 26 positive cases in patients younger than 10 years and 42 positive cases in patients older than 70 years.

The results depict the distribution of organisms isolated from blood culture samples, offering crucial insights into bloodstream infections. Coagulase Negative Staphylococci emerged as the most prevalent organism, accounting for 21.95% of the isolates, indicative of its significance in nosocomial bloodstream infections. Klebsiella pneumoniae followed closely behind, comprising 17.89% of the isolates, underscoring its prominence as a cause of bacteremia, particularly in hospital settings. Acinetobacter spp. and Pseudomonas aeruginosa accounted for 13.41% and 11.18% of the isolates, respectively, highlighting their notable presence in bloodstream infections, often associated with healthcare environments. Staphylococcus aureus, a common cause of both community-acquired and healthcare-associated bacteremia, represented 7.11% of the isolates. Other identified organisms included Enterococcus spp., Escherichia coli, and Serratia spp., with positivity rates ranging from 5.28% to 6.50%. Less frequently isolated organisms included Enterobacter spp., Citrobacter spp., Burkholderia spp., and Salmonella Typhi, each comprising less than 5% of the total isolates. Notably, Proteus spp. and Raoultella spp. were the least commonly isolated, each accounting for only 0.61% of the total isolates. These findings underscore the diverse spectrum of pathogens responsible for bloodstream infections, aiding in the formulation of targeted therapeutic strategies and infection control measures in clinical settings.



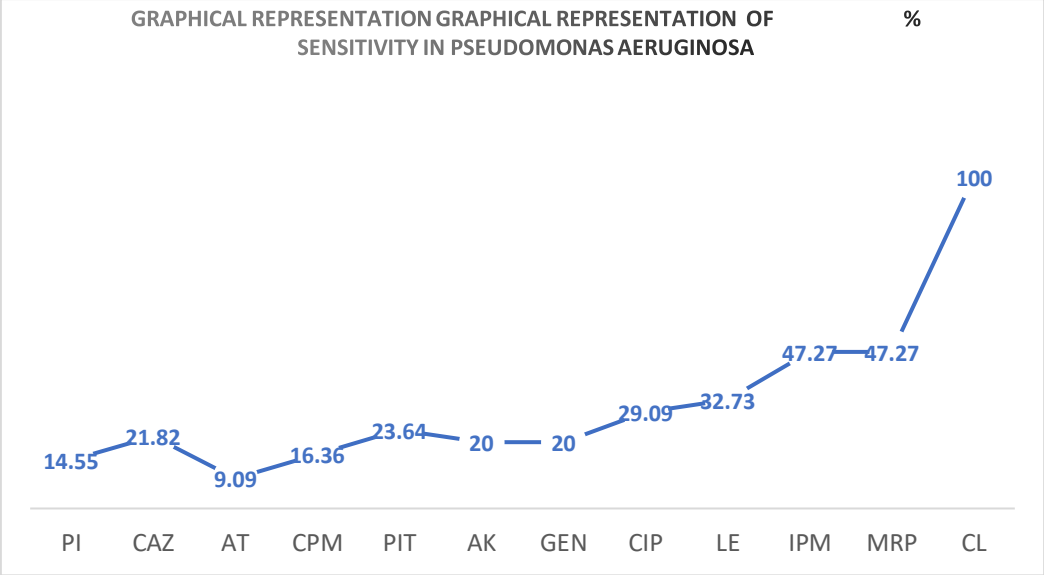


Tables 5: Organism wise Antimicrobial Sensitivity pattern

Organism – Klebsiella pneumoniae (% Sensitivity)														
PI	CPD	CXM	CTX	CPM	A/S	PIT	AMC	AK	GEN	CIP	COT	IPM	MRP	ETP
5.6	3.4	4.5	2.2	7.9	4.5	9.0	4.5	23.8	20.4	12.5	14.7	27.2	27.2	27.2

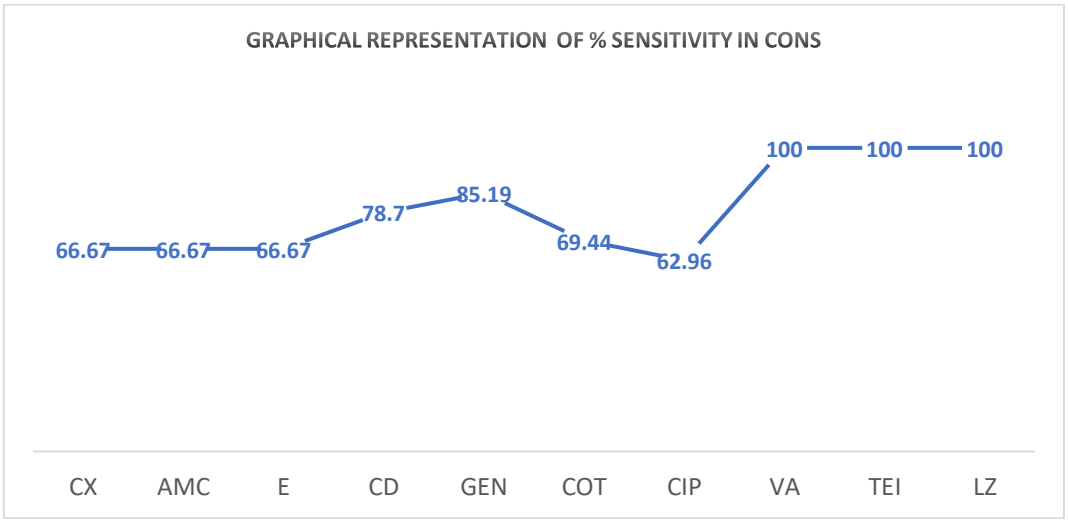
The table presents the sensitivity percentages of various antibiotics against Klebsiella pneumoniae, a bacterium commonly associated with nosocomial infections. Each percentage denotes the proportion of Klebsiella pneumoniae isolates that exhibit Sensitivity to a specific antibiotic. Notably, Piperacillin (PI) demonstrates a sensitivity rate of 5.6%, while Cefpodoxime (CPD) and Cefuroxime (CXM) show sensitivities of 3.4% and 4.5%, respectively. Of particular interest are the carbapenems, Imipenem (IPM), Meropenem (MRP), and Ertapenem (ETP), which exhibit identical sensitivity rates of 27.2%. This suggests their potential efficacy as treatment options for Klebsiella pneumoniae infections. Additionally, Amikacin (AK) and Gentamicin (GEN) display sensitivities of 23.8% and 20.4%, respectively, indicating their usefulness in certain clinical scenarios. However, caution is warranted with antibiotics such as Cefotaxime (CTX) and Ciprofloxacin (CIP), which demonstrate lower sensitivity rates of 2.2% and 12.5%, respectively.

Organism – Pseudomonas aeruginosa (%Sensitivity)											
PI	CAZ	AT	CPM	PIT	AK	GEN	CIP	LE	IPM	MRP	CL
14.55	21.82	9.09	16.36	23.64	20.00	20.00	29.09	32.73	47.27	47.27	100.00



The sensitivity results reveal varying degrees of effectiveness among different antibiotics against Pseudomonas aeruginosa. Piperacillin demonstrates a sensitivity rate of 14.55%, while Ceftazidime and Cefepime exhibit slightly higher rates at 21.82% and 16.36%, respectively. Notably, Piperacillin/Tazobactam demonstrates a sensitivity rate of 23.64%, indicating its potential utility in treating Pseudomonas aeruginosa infections. Amikacin and Gentamicin both display a sensitivity rate of 20.00%, suggesting moderate efficacy. Among the fluoroquinolones, Ciprofloxacin shows a sensitivity rate of 29.09%, while Levofloxacin exhibits a higher sensitivity rate of 32.73%. Importantly, the carbapenems Imipenem and Meropenem demonstrate considerable efficacy, with sensitivity rates of 47.27% each, highlighting their importance as key treatment options. Colistin emerges as highly effective, with a sensitivity rate of 100.00%, underscoring its role as a crucial last-resort antibiotic for multidrug-resistant Pseudomonas aeruginosa infections.

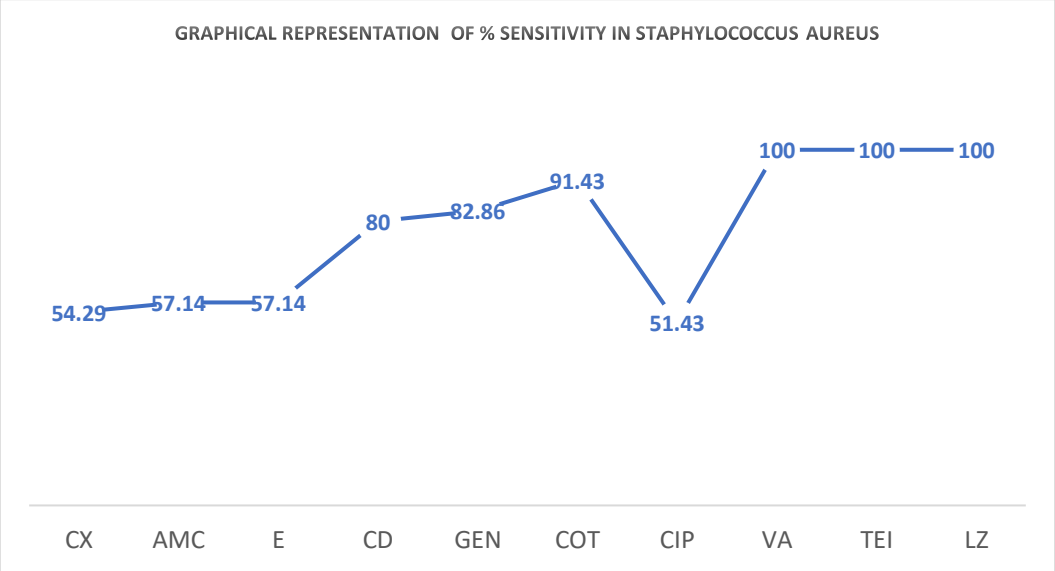
Organism – Coagulase Negative Staphylococci (% Sensitivity)									
CX	AMC	E	CD	GEN	COT	CIP	VA	TEI	LZ
66.67	66.67	66.67	78.70	85.19	69.44	62.96	100	100	100



The sensitivity results for Coagulase Negative Staphylococci (CONS) demonstrate generally high Sensitivity to the tested antibiotics. Among the antibiotics assessed, Clindamycin (CD) exhibits the highest sensitivity at 78.70%, followed closely by Gentamicin (GEN) at 85.19%. Amoxicillin/Clavulanic acid (AMC), Cefoxitin (CX), and Erythromycin (E) all display a sensitivity rate of 66.67%. Additionally, Trimethoprim/ Sulfamethoxazole (COT) and Ciprofloxacin (CIP) demonstrate moderate sensitivity at 69.44% and 62.96%, respectively. Notably, Vancomycin (VA), Teicoplanin (TEI), and Linezolid (LZ) exhibit complete sensitivity, with all CONS isolates being Sensitivite to these antibiotics. These results indicate that while Coagulase Negative Staphylococci show Sensitivity to a range of antibiotics, certain agents such as Vancomycin, Teicoplanin, and Linezolid are particularly effective and may serve as preferred treatment options in clinical practice for infections caused by CONS.

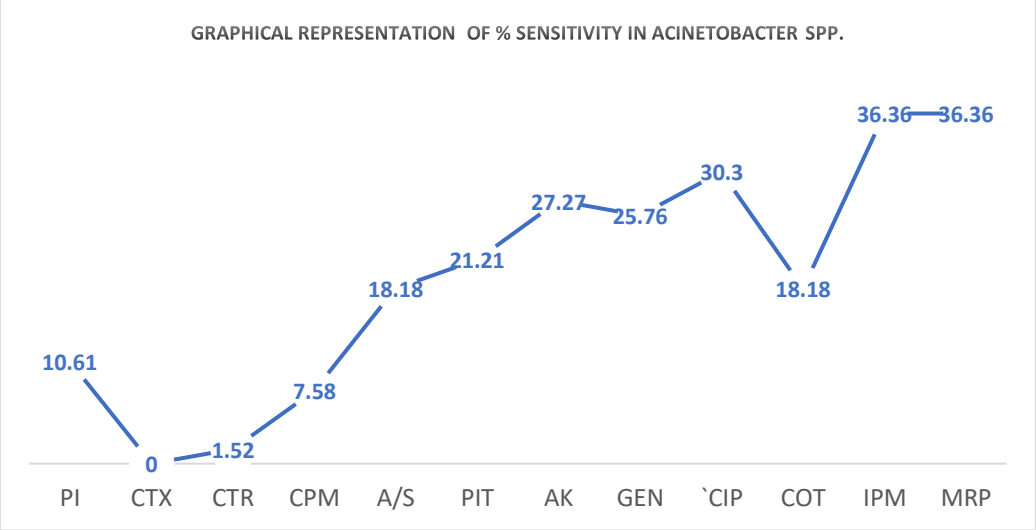
Organism – Staphylococcus aureus (% Sensitivity)									
CX	AMC	E	CD	GEN	COT	CIP	VA	TEI	LZ
54.29	57.14	57.14	80.00	82.86	91.43	51.43	100	100	100

Table-4: Distribution of Organism Isolated



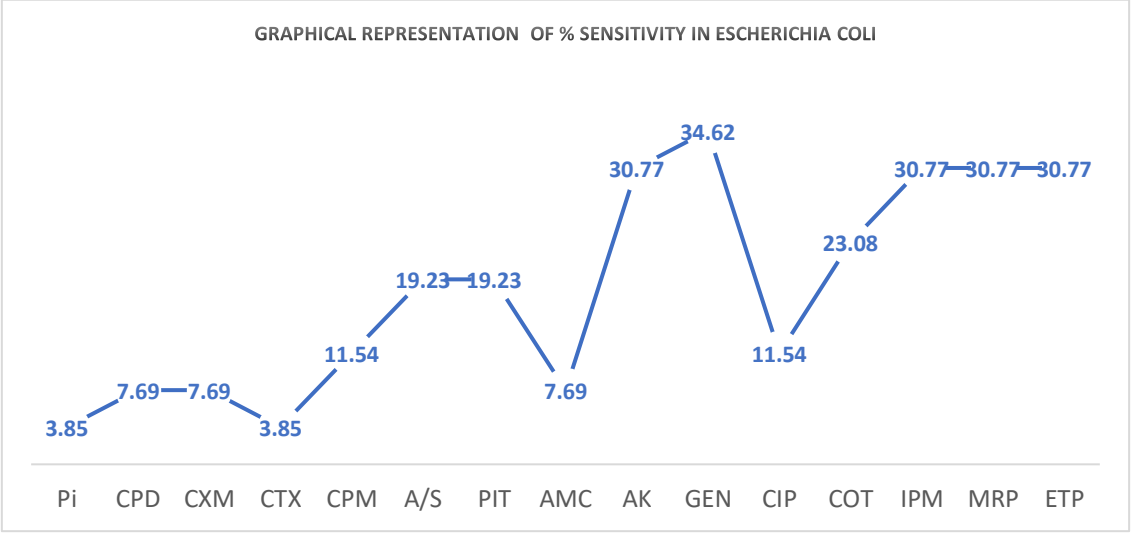
The sensitivity results for Staphylococcus aureus indicate varying degrees of Sensitivity to the tested antibiotics, with a subset of isolates identified as Methicillin-Resistant Staphylococcus aureus (MRSA) at a rate of 45.71%. Among the antibiotics assessed, Clindamycin (CD) demonstrates the highest sensitivity at 80.00%, followed closely by Gentamicin (GEN) at 82.86%. Amoxicillin/Clavulanic acid (AMC), Cefoxitin (CX), and Erythromycin (E) exhibit sensitivity rates of 57.14%. Additionally, Trimethoprim/Sulfamethoxazole (COT) and Ciprofloxacin (CIP) demonstrate moderate sensitivity at 91.43% and 51.43%, respectively. Notably, Vancomycin (VA), Teicoplanin (TEI), and Linezolid (LZ) exhibit complete sensitivity, with all S. aureus isolates, including MRSA, being Sensitivite to these antibiotics.

Organism-Acinetobacter spp. (%Sensitivity)											
PI	CTX	CTR	CPM	A/S	PIT	AK	GEN	`CIP	COT	IPM	MRP
10.61	0.00	1.52	7.58	18.18	21.21	27.27	25.76	30.30	18.18	36.36	36.36



The sensitivity results for Acinetobacter spp. indicate varied Sensitivity to antibiotics. Notably, Piperacillin (PI) has 10.61% sensitivity, while Cefotaxime (CTX) shows no sensitivity. Ceftazidime (CTR) has 1.52% sensitivity, and Cefepime (CPM) shows 7.58% sensitivity. Ampicillin/Sulbactam (A/S) has 18.18% sensitivity, and Piperacillin/Tazobactam (PIT) has 21.21% sensitivity. Among aminoglycosides, Amikacin (AK) has 27.27% sensitivity, and Gentamicin (GEN) has 25.76% sensitivity. Ciprofloxacin (CIP) demonstrates 30.30% sensitivity, and Trimethoprim/Sulfamethoxazole (COT) has 18.18% sensitivity. Carbapenems Imipenem (IPM) and Meropenem (MRP) exhibit 36.36% sensitivity each. These findings highlight the need for careful antibiotic selection when treating Acinetobacter spp. Infections

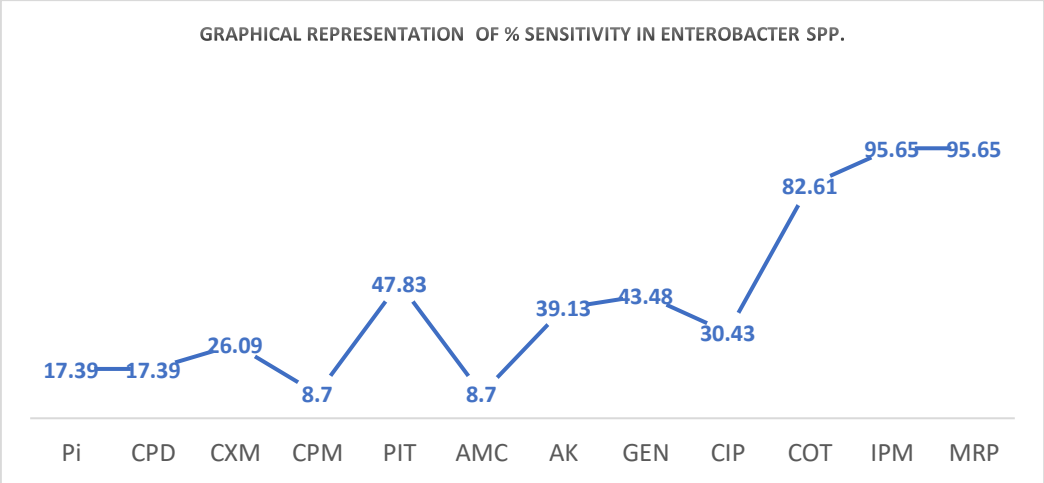
Organism-Escherichiacoli (%Sensitivity)														
Pi	CPD	CXM	CTX	CPM	A/S	PIT	AMC	AK	GEN	CIP	COT	IPM	MRP	ETP
3.85	7.69	7.69	3.85	11.54	19.23	19.23	7.69	30.77	34.62	11.54	23.08	30.77	30.77	30.77



The sensitivity results for Escherichia coli against various antibiotics exhibit a range of Sensitivity. Piperacillin (Pi), Cefpodoxime (CPD), Cefuroxime (CXM), and Cefotaxime (CTX) show relatively low sensitivity rates ranging from 3.85% to 7.69%. Cefepime (CPM) demonstrates a slightly higher sensitivity rate of 11.54%. Ampicillin/Sulbactam (A/S) and Piperacillin/Tazobactam (PIT) both display a sensitivity rate of 19.23%, while Amoxicillin/Clavulanic acid (AMC) shows a lower rate of 7.69%. Among the aminoglycosides, Amikacin (AK) demonstrates the highest sensitivity rate at 30.77%, followed closely by Gentamicin (GEN) at 34.62%. Ciprofloxacin (CIP) exhibits a sensitivity rate of 11.54%, while Trimethoprim/Sulfamethoxazole (COT) shows a higher rate of 23.08%. Notably, the carbapenems Imipenem (IPM), Meropenem (MRP),

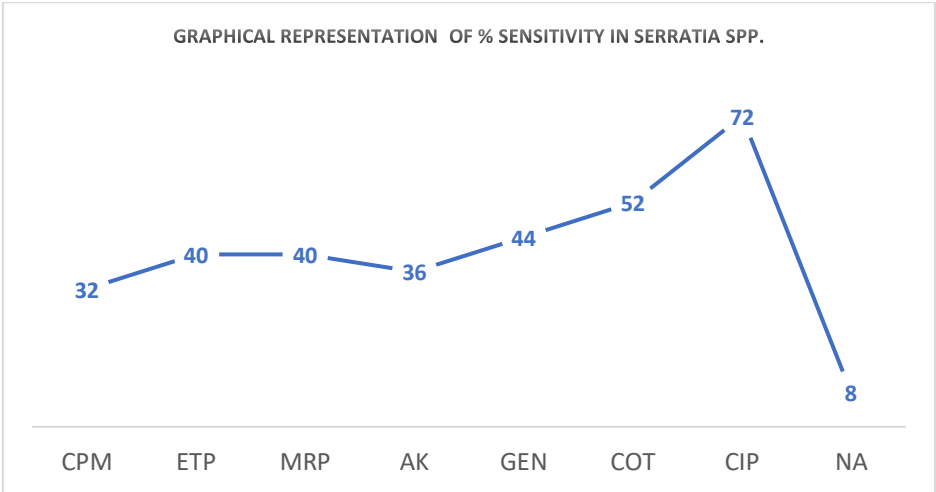
and Ertapenem (ETP) all demonstrate consistent sensitivity rates of 30.77%.

Organism- Enterobacter spp. (%Sensitivity)											
Pi	CPD	CXM	CPM	PIT	AMC	AK	GEN	CIP	COT	IPM	MRP
17.39	17.39	26.09	8.70	47.83	8.70	39.13	43.48	30.43	82.61	95.65	95.65



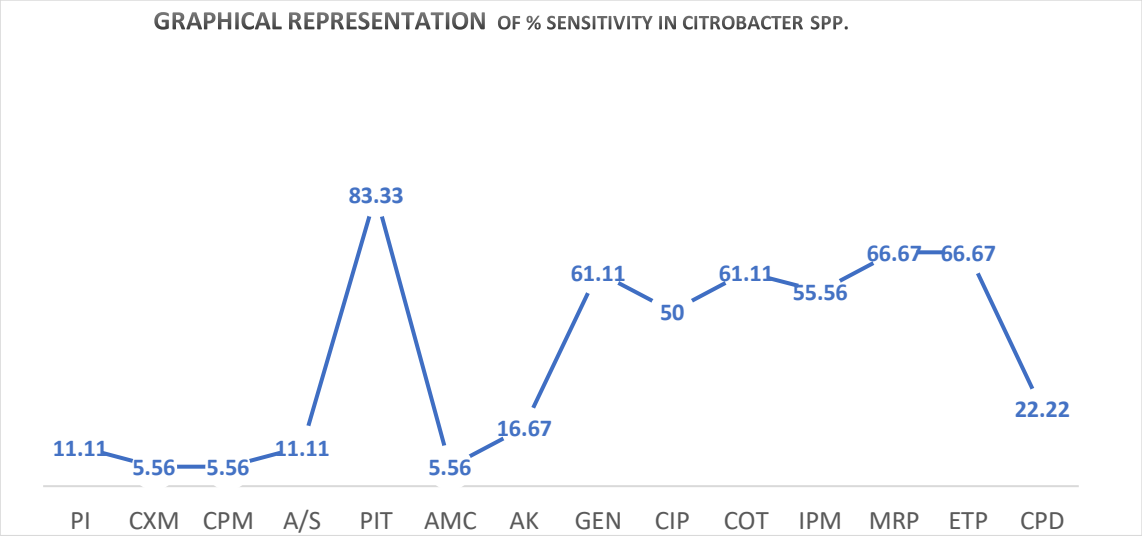
The sensitivity results for Enterobacter spp. against various antibiotics indicate varying degrees of Sensitivity. Piperacillin (Pi), Cefpodoxime (CPD), and Cefuroxime (CXM) show moderate sensitivity rates ranging from 17.39% to 26.09%. Cefepime (CPM) exhibits a lower sensitivity rate of 8.70%. Notably, Piperacillin/Tazobactam (PIT) demonstrates a higher sensitivity rate at 47.83%, while Amikacin (AK) and Gentamicin (GEN) exhibit rates of 39.13% and 43.48%, respectively. Ciprofloxacin (CIP) shows a sensitivity rate of 30.43%, and Trimethoprim/Sulfamethoxazole (COT) demonstrates a notably high sensitivity rate of 82.61%. Carbapenems, including Imipenem (IPM) and Meropenem (MRP), display high sensitivity rates of 95.65%, indicating their effectiveness as treatment options for Enterobacter sp. infections.

Organism- Serratia sp. (% Sensitivity)							
CPM	ETP	MRP	AK	GEN	COT	CIP	NA
32	40	40	36	44	52	72	8



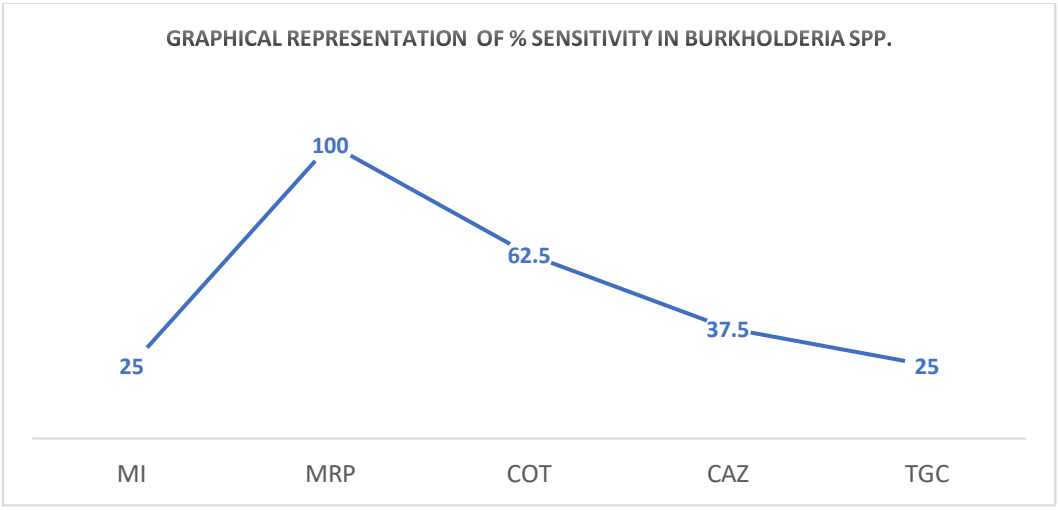
The sensitivity results for Serratia species (sp.) against various antibiotics indicate varying degrees of Sensitivity. Cefepime (CPM), Ertapenem (ETP), and Meropenem (MRP) show moderate sensitivity rates ranging from 32% to 40%, while Ciprofloxacin (CIP) demonstrates notably higher sensitivity at 72%. Additionally, Trimethoprim/Sulfamethoxazole (COT) displays a relatively high sensitivity rate of 52%. However, Nalidixic Acid (NA) exhibits a lower sensitivity rate at 8%.

Organism – Citrobacter spp.(%Sensitivity)													
PI	CXM	CPM	A/S	PIT	AMC	AK	GEN	CIP	COT	IPM	MRP	ETP	CPD
11.11	5.56	5.56	11.11	83.33	5.56	16.67	61.11	50.00	61.11	55.56	66.67	66.67	22.22



The sensitivity results for Citrobacter species (spp.) against various antibiotics indicate notable variations in Sensitivity. Piperacillin (PI) demonstrates a sensitivity rate of 11.11%, while Cefuroxime (CXM) and Cefepime (CPM) both exhibit lower rates at 5.56%. Ampicillin/Sulbactam (A/S) shows a similar sensitivity rate of 11.11%. In contrast, Piperacillin/Tazobactam (PIT) demonstrates the highest sensitivity rate at 83.33%. Among the aminoglycosides, Amikacin (AK) exhibits a sensitivity rate of 16.67%, while Gentamicin (GEN) shows a notably higher rate at 61.11%. Ciprofloxacin (CIP) demonstrates a sensitivity rate of 50.00%, and Trimethoprim/Sulfamethoxazole (COT) displays a comparable rate at 61.11%. Notably, the carbapenems Imipenem (IPM), Meropenem (MRP), and Ertapenem (ETP) all exhibit relatively high sensitivity rates ranging from 55.56% to 66.67%. Conversely, Cefpodoxime (CPD) exhibits a lower sensitivity rate of 22.22%.

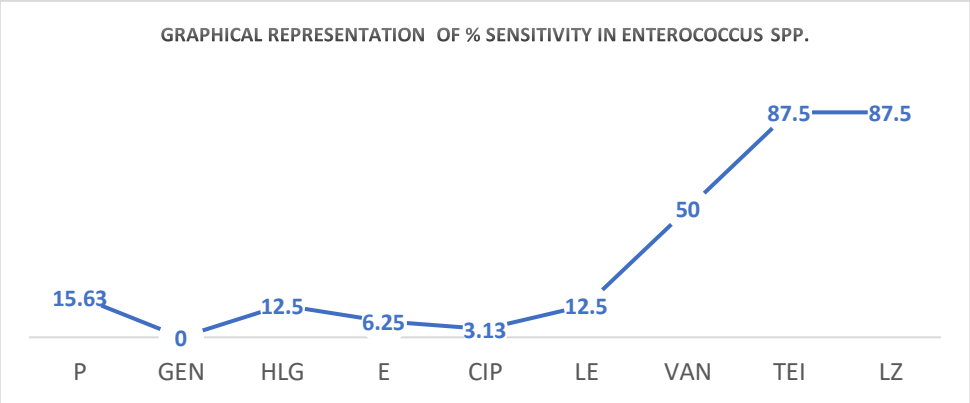
Organism – Burkholderia Spp.(% Sensitivity)				
MI	MRP	COT	CAZ	TGC
25	100	62.5	37.5	25



The sensitivity results for Burkholderia species (Spp.) against various antibiotics reveal notable variations in Sensitivity. Minocycline (MI) exhibits a sensitivity rate of 25%, while Meropenem (MRP) demonstrates the highest sensitivity rate at 100%, indicating its effectiveness in treating Burkholderia spp. infections.

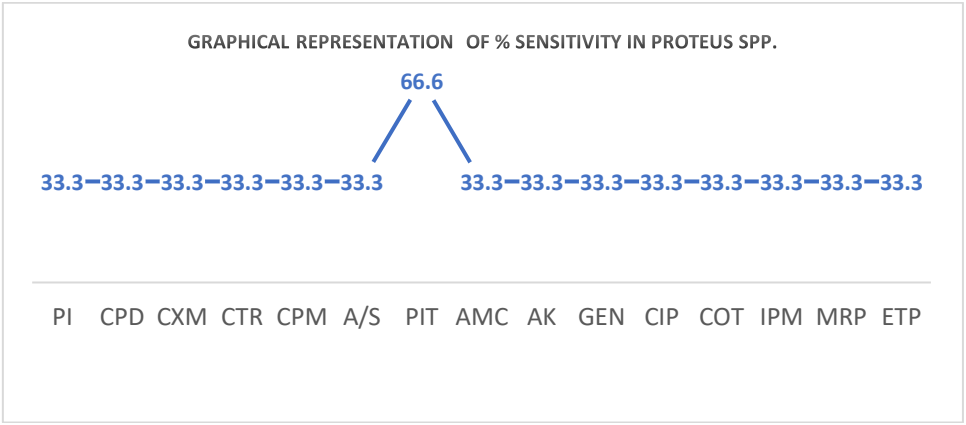
Trimethoprim/Sulfamethoxazole (COT) displays a moderate sensitivity rate of 62.5%, while Ceftazidime (CAZ) shows a lower sensitivity rate at 37.5%. Tigecycline (TGC) exhibits a sensitivity rate of 25%.

Organism – Enterococcus spp. (% Sensitivity)								
P	GEN	HLG	E	CIP	LE	VAN	TEI	LZ
15.63	0.00	12.50	6.25	3.13	12.50	50.00	87.50	87.50



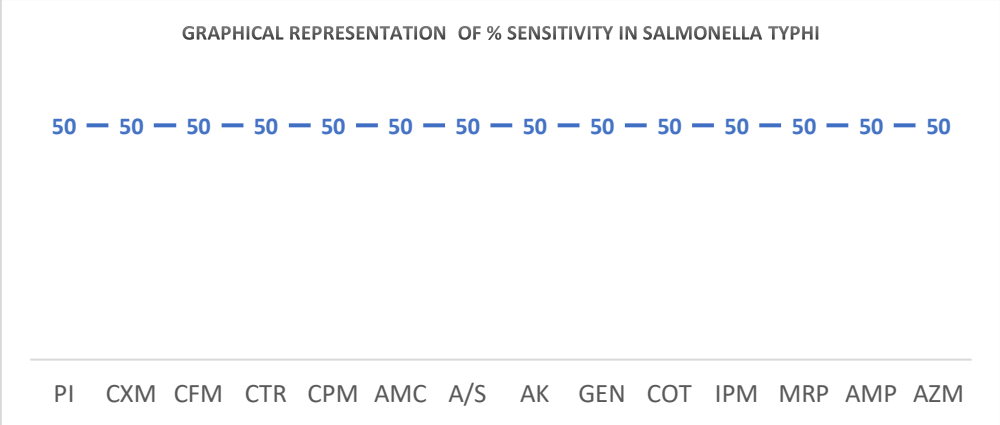
The sensitivity results for Enterococcus species (spp.) against various antibiotics indicate varied Sensitivity. Penicillin (P) exhibits a sensitivity rate of 15.63%, while Gentamicin (GEN) shows no sensitivity. High-level Gentamicin (HLG) demonstrates a sensitivity rate of 12.50%, and Erythromycin (E) exhibits a rate of 6.25%. Ciprofloxacin (CIP) displays a sensitivity rate of 3.13%. Notably, Linezolid (LZ) and Teicoplanin (TEI) both demonstrate the highest sensitivity rates at 87.50%, followed by Vancomycin (VAN) at 50.00%.

Organism – Proteus spp. (%Sensitivity)														
PI	CPD	CXM	CTR	CPM	A/S	PIT	AMC	AK	GEN	CIP	COT	IPM	MRP	ETP
33.3	33.3	33.3	33.3	33.3	33.3	66.6	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3



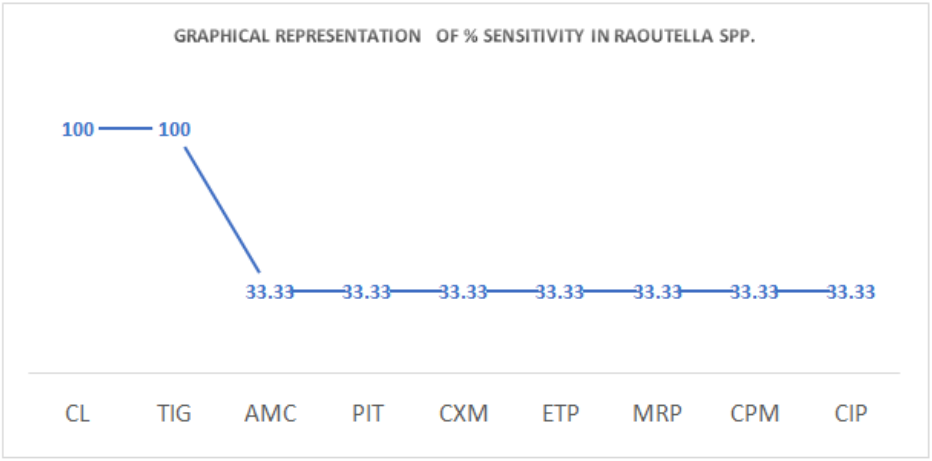
The sensitivity results for Proteus species (spp.) against various antibiotics reveal a consistent pattern of Sensitivity. Piperacillin (PI), Cefpodoxime (CPD), Cefuroxime (CXM), Ceftriaxone (CTR), Cefepime (CPM), Ampicillin/Sulbactam (A/S), Amoxicillin/Clavulanic acid (AMC), Amikacin (AK), Gentamicin (GEN), Ciprofloxacin (CIP), Trimethoprim/Sulfamethoxazole (COT), Imipenem (IPM), Meropenem (MRP), and Ertapenem (ETP) all demonstrate a uniform sensitivity rate of 33.3%. However, Piperacillin/Tazobactam (PIT) stands out with a higher sensitivity rate of 66.6%.

Organism – SalmonellaTyphi(%Sensitivity)													
PI	CXM	CFM	CTR	CPM	AMC	A/S	AK	GEN	COT	IPM	MRP	AMP	AZM
50	50	50	50	50	50	50	50	50	50	50	50	50	50



The sensitivity results for Salmonella Typhi against various antibiotics demonstrate a consistent Sensitivity pattern, with each antibiotic showing a uniform sensitivity rate of 50%. This uniformity is observed across Piperacillin (PI), Cefuroxime (CXM), Cefixime (CFM), Ceftriaxone (CTR), Cefepime (CPM), Amoxicillin/Clavulanic acid (AMC), Ampicillin/Sulbactam (A/S), Amikacin (AK), Gentamicin (GEN), Trimethoprim/Sulfamethoxazole (COT), Imipenem (IPM), Meropenem (MRP), Ampicillin (AMP), and Azithromycin (AZM). These findings suggest that Salmonella Typhi maintains a consistent Sensitivity profile across a broad spectrum of antibiotics, which provides valuable guidance for treatment selection. However, continued monitoring of antibiotic resistance patterns remains crucial to ensure effective management of Salmonella Typhi infections and to mitigate the risk of resistance development.

Organism – Rautella spp. (% Sensitivity)								
CL	TIG	AMC	PIT	CXM	ETP	MRP	CPM	CIP
100	100	33.33	33.33	33.33	33.33	33.33	33.33	33.33



The sensitivity results for Raoultella species (spp.) against various antibiotics reveals notable variations. Chloramphenicol (CL) and Tigecycline (TIG) exhibit a high sensitivity rate of 100%, indicating their efficacy against Raoultella spp. infections. However, Ampicillin/Clavulanic acid (AMC) and Piperacillin/Tazobactam (PIT) show lower sensitivity rates of 33.33%, suggesting limited effectiveness. Similarly, Cefuroxime (CXM), Ertapenem (ETP), Meropenem (MRP), Cefepime (CPM), and Ciprofloxacin (CIP) also demonstrate sensitivity rates of 33.33%.

DISCUSSION

The findings of this retrospective study on the prevalence and antibiotic sensitivity patterns of bloodstream infections (BSIs) among patients admitted to a tertiary care center reveal insights that align with and contribute to the existing body of literature on this subject. A comparative analysis with previous research allows for a deeper understanding of the implications of the current findings.

The observed positivity rate of 29.8% in this study is consistent with the range reported in similar studies conducted in various healthcare settings globally [6][7]. This underscores the persistent burden of BSIs and emphasizes the need for effective infection

control strategies and antimicrobial stewardship programs to mitigate their impact.

Gender-wise distribution analysis indicated a slightly higher prevalence of BSIs among male patients, which is in line with the findings of several studies [8][9]. This gender disparity may be attributed to differences in immune response, lifestyle factors, or occupational exposures, highlighting the importance of gender-sensitive approaches in infection prevention and control.

Age-wise distribution revealed a higher prevalence of BSIs among older adults, particularly those aged 51-60 years, which corroborates findings from previous studies [10][11]. This age group often presents with multiple comorbidities and age-related immune dysfunction, rendering them more vulnerable to infections. Targeted interventions tailored to the specific needs of this demographic are essential for effective infection management.

Comparison of bacterial isolates with existing literature demonstrates similarities in the predominant pathogens identified. Coagulase-negative Staphylococci, Klebsiella pneumoniae, and Acinetobacter spp. emerge as common culprits, consistent with global trends in healthcare-associated infections [12][13]. However, variations in prevalence and antimicrobial resistance profiles may reflect differences in local epidemiology, antimicrobial usage patterns, and infection control practices.

The antibiotic sensitivity patterns observed in this study align with reports of increasing antimicrobial resistance worldwide. High rates of resistance, particularly among gram-negative bacteria, underscore the urgent need for antimicrobial stewardship interventions and the development of novel therapeutic strategies [14][15].The variability in sensitivity patterns across different pathogens highlights the importance of individualized treatment approaches guided by local surveillance data.

This study contributes valuable insights to the field by providing context-specific data on the epidemiology and antimicrobial resistance of BSIs. By comparing and contextualizing the findings within the broader literature, it underscores the importance of evidence-based interventions and collaborative efforts to address the challenges posed by antimicrobial resistance and improve patient outcomes in the management of BSIs.

CONCLUSION

In conclusion, this comparative discussion elucidates the significance of the findings from this retrospective study on bloodstream infections. By contextualizing the results within the existing literature, it underscores the persistent challenges posed by BSIs and antimicrobial resistance while highlighting the importance of evidence-based interventions and collaborative efforts to combat these threats effectively. Continued surveillance and research are essential to monitor trends, inform practice, and develop targeted strategies aimed at reducing the burden of BSIs and antimicrobial resistance in healthcare settings.

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