

**A STUDY OF ANTIBIOTIC SENSITIVITY IN A PEDIATRIC WARD
POPULATION OF A TERTIARY TEACHING HOSPITAL**

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ABSTRACT

Antibiotic sensitivity is the susceptibility of bacteria to a specific antibiotic. Antibiotic susceptibility testing (AST) is carried out to determine the sensitivity of an antibiotic to a particular microorganism. Antimicrobial susceptibilities may vary depending on the geography as well as the host-related factors. The aim of this study is to evaluate the prevalence of bacterial infection in a tertiary care hospital and also to ascertain the antibiotic sensitivity of commonly encountered organisms. Results indicated that E.coli and Klebsiella are the commonest pathogens found in our hospital. The sensitivity of these bacteria towards different antibiotics are found to be E.coli 30.7% and Klebsiella 69.2% for Gentamicin, E.coli 50% and Klebsiella 50% for

Imipenem, E.coli 50% and Klebsiella 50% for Cefotaxime, E.coli 33.3% and Klebsiella 66.7% for Ceftazidime, E.coli 40% and Klebsiella 60% for Meropenem. The data from our study indicated that Klebsiella has shown more sensitivity to Gentamicin while E.Coli is found to be more sensitivity to both Imipenem and Cefotaxime. Care for pediatric patients could be improved with use of a pediatric-specific antibiogram.

KEYWORDS: Antibiotic susceptibility testing (AST), E.Coli, Klebsiella.

INTRODUCTION

Antibiotic sensitivity is the susceptibility of bacteria to a specific antibiotic. Antibiotic susceptibility testing (AST) is carried out to determine the sensitivity of an antibiotic to a

particular microorganism. Antimicrobial susceptibilities may vary depending on the geography as well as the host-related factors. Establishing the pattern of infection and antimicrobial sensitivities in the local environment is critical to rational use of antibiotics and the development of management algorithms. Severe acute malnutrition (SAM) results from a relatively short duration of nutritional deficit that is often complicated by marked anorexia and concurrent infective illness.^[1] There is more emphasis on malnutrition and infections due to that study showed high incidence of infections, especially pneumonia and gastrointestinal infections.

The main factors influencing the increasing resistance of pathogens causing these infections are poor hygiene, lack of education in general population (especially parents) and uncontrolled use of antibiotics in animal husbandry and agriculture as well as the irrational use of antibiotics in medicine.^[2 3 4] This paper considers the impact of socio-economic factors, as well as irrational antibiotic use, on the development of bacterial resistance in children and the experiences that have contributed to the reduction of bacterial resistance. In the USA, prescribing of antibiotics (especially penicillin) to pediatric population increased by 48% from 1980 to 1992, while in 44% of cases, antibiotics were prescribed to children for common cold the most common infections in pediatric are acute infections for respiratory, gastrointestinal and infections were gentamycin, Imipenam, meropenam, cefotaxime and ceftazidime. if selecting irrationality antibiotics cause increase in cost, selection of drug resistance organism and increased incidence of untoward side effects. Hence this work was planned to study the antibiotic sensitivity in a pediatric ward population. Children, especially infants, are particularly sensitive to these infections which contribute to high mortality in countries with inadequate health care. For example, in Asia, one infant dies every 2 min due to infections caused by resistant bacteria Infections.^[5] The high rates of antimicrobial sensitivity reported among these bacterial pathogens. Some strains of *Klebsiella* and *Pseudomonas* are resistant to Ciprofloxacin however, my results indicated *Klebsiella* are highly sensitive to Gentamycin, Imipenam and meropenam. *E. Coli* is highly sensitive to Gentamycin, Imipenam and meropenam my isolate also showed same pattern. *Klebsiella pneumoniae* is also well known in the environment and can be cultured from soil, water and vegetables. Mortality in *Klebsiella pneumoniae* is around 50% due to the underlying disease that tends to be present in affected persons. While normal pneumonia frequently resolves without complication, *Klebsiella pneumoniae* more frequently causes lung destruction and

pockets of pus in the lung (known as abscesses). The mortality rate for untreated cases is around 90%.^[6]

Escherichia coli is a common inhabitant of the human and animal gut, but can also be found in water, soil and vegetation. It is the leading pathogen causing urinary tract infections and is among the most common pathogens causing blood stream infections, wounds, otitis media and other complications in humans.^[7,8] *E. coli* is also the most common cause of food and water-borne human diarrhea worldwide and in developing countries, causing many deaths in children under the age of five years.^[9] However, the choice of antibiotics has to be guided by locally prevalent pathogens and their antibiotic susceptibility patterns. Due to the increasing problem of bacterial resistance to antibiotics and the frequent need to initiate therapy before microbiological diagnosis is available, a register of all positive bacterial cultures and their antibiotic sensitivities was maintained in one of the general paediatric ward of hospital. Hence this work was planned to study the antibiotic sensitivity in pediatric ward.

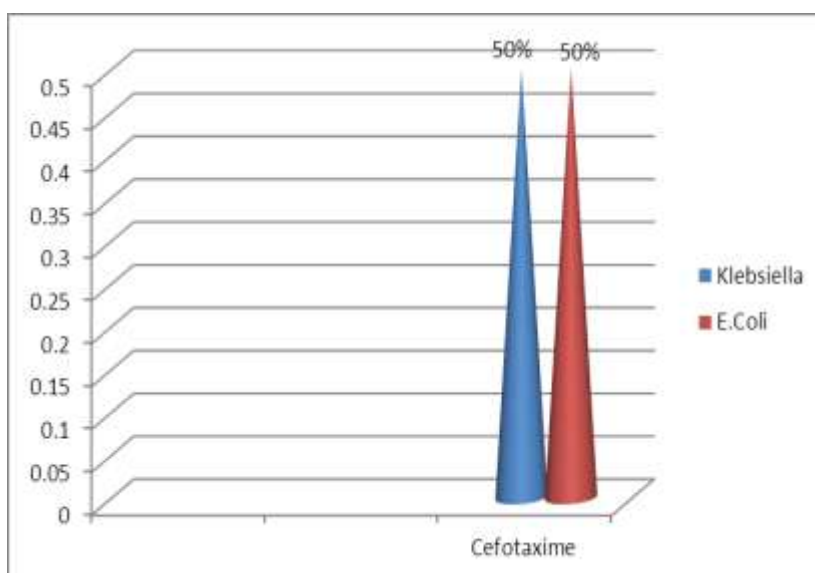
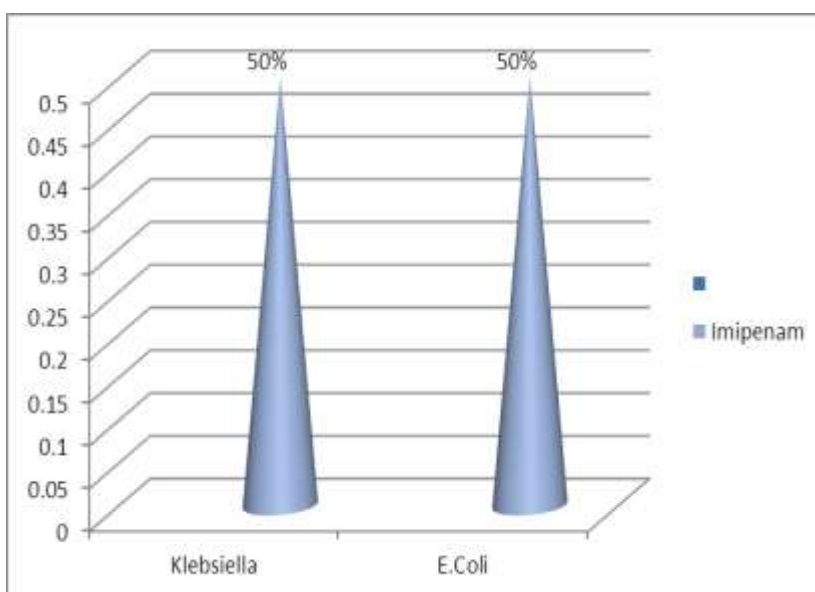
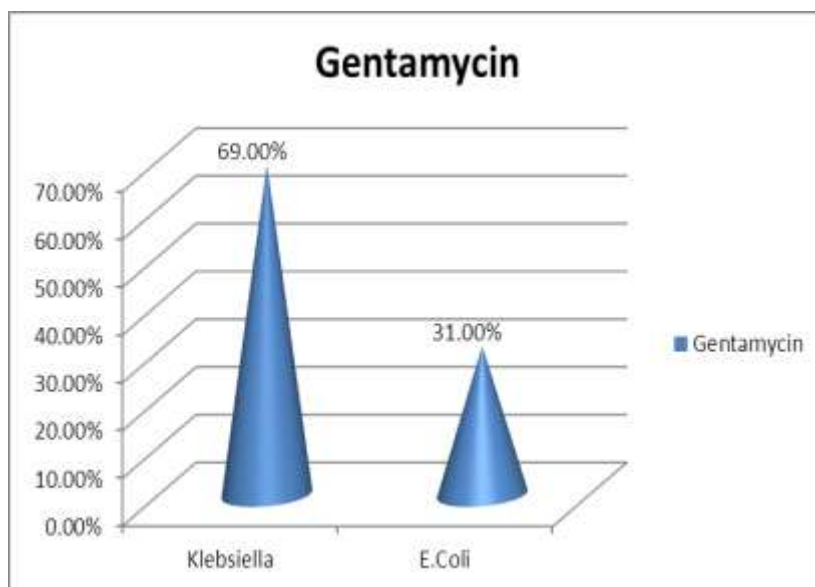
MATERIALS AND METHODS

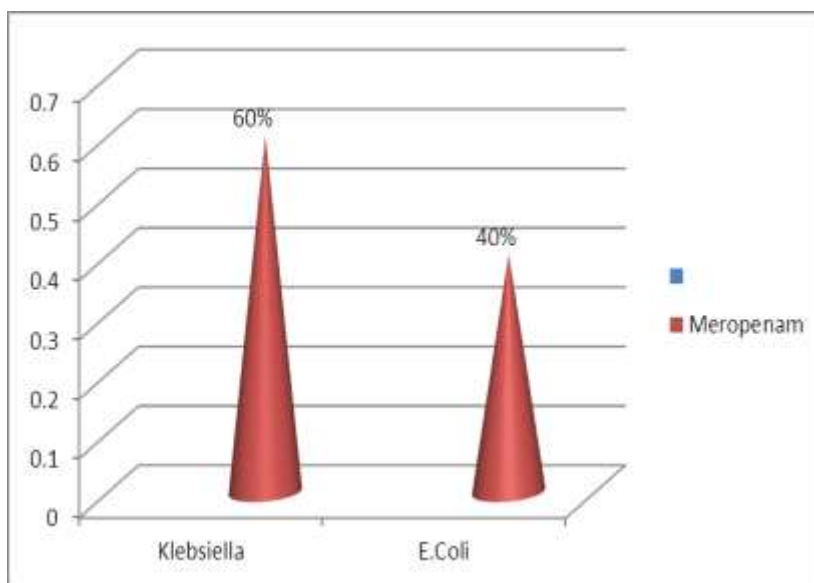
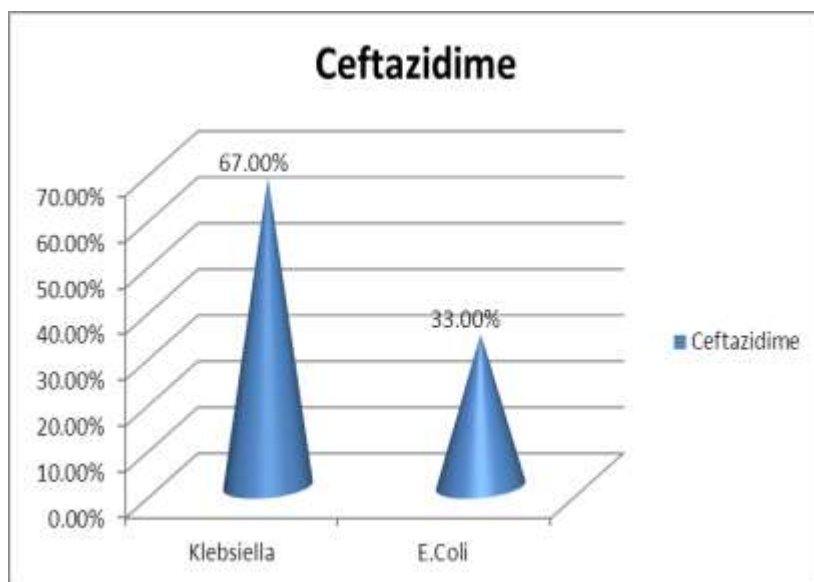
The study was based on retrospective observational study which was carried out in the department of pediatric ward at MVJ Hospital and Research Center. The duration of the study is 5 months in which antibiotic sensitivity report is collected from laboratory and microbiology department. This observational study was identified using electronic database such as MEDLINE and PUBMED search engine. Relevant English articles published in standard journals and database was reviewed. Data was extracted and methodological quality was assessed and tabulated.

RESULTS

Drugs	Klebsiella	E.Coli
Gentamycin	69.2%	30.7%
Imipenam	50%	50%
Cefotaxime	50%	50%
Ceftazidime	66.7%	33.3%
Meropenam	60%	40%

The sensitivity of these bacteria towards different antibiotics are found to be *E. coli* 30.7% and *Klebsiella* 69.2% for Gentamicin, *E. coli* 50% and *Klebsiella* 50% for Imipenem, *E. coli* 50% and *Klebsiella* 50% for Cefotaxime, *E. coli* 33.3% and *Klebsiella* 66.7% for Ceftazidime, *E. coli* 40% and *Klebsiella* 60% for Meropenem. The data from our study indicated that *Klebsiella* has shown more sensitivity to Gentamicin while *E. coli* is found to be more sensitivity to both Imipenem and Cefotaxime.





DISCUSSION

The sensitivity of these bacteria towards different antibiotics are found to be E.coli 30.7% and Klebsiella 69.2% for Gentamicin, E.coli 50% and Klebsiella 50% for Imipenem, E.coli 50% and Klebsiella 50% for Cefotaxime, E.coli 33.3% and Klebsiella 66.7% for Ceftazidime, E.coli 40% and Klebsiella 60% for Meropenem. The data from our study indicated that Klebsiella has shown more sensitivity to Gentamicin while E.Coli is found to be more sensitivity to both Imipenem and Cefotaxime.

Antibiotic sensitivity is the susceptibility of bacteria to a specific antibiotic. Antibiotic susceptibility testing (AST) is carried out to determine the sensitivity of an antibiotic to a particular microorganism. Significance of this study was for bacterial identification and

antibiotic susceptibility testing play an essential role in pediatric care and the control of antibiotic resistance by indicating which antibiotics are most likely to cure an infection, Reducing the empirical prescription of "broad-spectrum" antibiotics, which are partly responsible for the rapid increase in antibiotic resistance, Avoiding the unnecessary prescription of antibiotics reduces healthcare costs. ID/AST tests also play a role in epidemiological monitoring; making it possible to track changes in microbial resistance patterns in healthcare settings.^[10]

CONCLUSION

Antibiotic Sensitivity testing was a study is with the pediatric patients samples. Our observations indicated that among the different pathogens *klebsiella* and *e.coli* are most common cause for infection. The antibiotic susceptibility testing indicated that gentamicin is more sensitive to *klebsiella* and cefatoxime and imipenam are sensitive to *E.coli*. Rationality is the selection and antibiotics depending on bacterial sensitivity plays a vital role is the management of infectious diseases and bacterial resistance.

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