



## Meropenem as a broad-spectrum antibiotic choice for various bacterial infections

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### ABSTRACT

There are Numerous Antibiotics are available for the Treatment of numerous kinds of Bacterial Infections but the selection of Particular antibiotic will always hold the Key. The Study was carried out to evaluate whether Meropenem as a Choice of Antibiotic for various Bacterial Infections. To assess the effectiveness of Meropenem, the field survey for this project was conducted through a structured questionnaire for the doctors out in Bengaluru for Period of 2 months with the Support of Micro Labs Pvt. Ltd by involving 150 leading Doctors in the City from March to April 2020. The Survey population was chosen based on convenient random sampling. Analysis was done based on the several diseases associated with the Bacterial Infections and the occurrence of these Infections observed in their Clinical Practice every week. Comparison of Infections in ICU'S and comparison were made with the other available Antibiotics for the combination treatment and different conditions on using Meropenem. The Study Outcomes indicated that Most of the Doctors favored Meropenem as the Antibiotic Choice for their Prescription.

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### INTRODUCTION

In the current framework antibiotics which play a very pivotal to support the life of human beings. Antibiotics are the medication given to the patients to cease the infections which are caused by the bacteria (Wiseman *et al.*, 1995). They do this by stopping the growth of bacteria by killing or keeping from copying themselves and also reproducing. Meropenem is a broad-spectrum antibiotic which

is used to treat diverse types of bacterial infections. In this it includes infections like bacterial meningitis, intra-abdominal infections, sepsis, and also pneumonia (Goyal and Rajput, 2014). It is an intra venous injection. Intra-abdominal infection (IAI) is a broad term that enclose a number of infectious processes, including peritonitis, diverticulitis, cholecystitis, cholangitis, and pancreatitis. Primary peritonitis is an infection of the peritoneal cavity without breaking of the entire gastrointestinal (GI) tract (Bauernfeind *et al.*, 1989). Skin and Soft tissue Infections (SSTIs) are clinical activity of variable exhibition, etiology and seriousness that multifaceted microbial intrusion of the layers of the skin and prime delicate tissues (Lenhard *et al.*, 2017). SSTIs go from gentle diseases, for example, pyoderma, to genuine perilous contaminations, for example, necrotizing fasciitis.

Meningitis is a contamination in films (meninges) abutting the cerebrum and spinal rope (Zhanel *et al.*, 1998). Meningitis can be brought about by a bacterial, parasitic or viral disease. Meningitis can be intense, with a brisk beginning of manifestations, it

very well may be incessant, enduring a month or much more, or it tends to be gentle or aseptic (Santos *et al.*, 2001).

The common side effects are head ache, vomiting, nausea, twinge, rashes, and also pain at the site of the injection (Lerma and Group, 2001). The considerable side effects will include clostridium difficile injection, anaphylaxis allergy, and also seizures (Schmutzhard *et al.*, 1995).

The person who is hypersensitive to the beta lactam antibiotic is more to be anticipating to meropenem also. Using this drug during the pregnancy is on the whole safe. Meropenem will normally show its action of drug by the bacterial death and also by the obstructing of the synthesis of the cell wall (Force *et al.*, 2008).

It is a broad-spectrum antibiotic which is used to treat many bacterial infection Intra-abdominal infections, Pneumonia, Sepsis, Meningitis (Kulengowski *et al.*, 2018).

## MATERIALS AND METHODS

### Nature of Research

An explained and the descriptive approach was followed as the research is involved conducting a survey in which data is collected on the drug Meropenem and to understand the sales of the drug and the other competitive brands in Bengaluru. It is aimed at collecting data from doctors working in Bengaluru.

### Research design

The field survey for this project was conducted through a structured questionnaire for the doctors. The questionnaire consists of both open-ended and close ended questions. All the data collected is both primary data and secondary data which has been used for the project (Jiang *et al.*, 2018).

### Universe and survey population

The study was conducted in Bengaluru. Survey population was chosen based on convenient random sampling. The sample consists of 150 Doctors in Bengaluru of the areas of north part and south part of Bengaluru.

### Sample size and technique

The sample consists of 150 doctors. The selection of doctors was done based on the random sampling (Kulengowski *et al.*, 2019).

### Data collection and data resources

The study is based on the primary data and the secondary data.

### Primary data

The survey was collected through the predetermined questionnaire and which is filled by the personal interview. The survey is also conducted from the national Criticare Conference 2020.

### Secondary data

Scanned various sources to accesses the secondary data which has formed the reference base.

### Study period

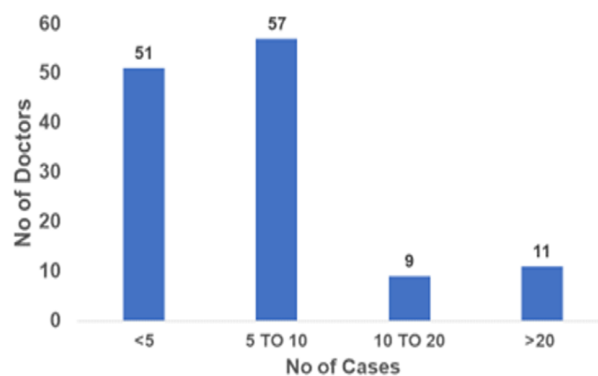
A Prospective study was conducted for 2 months March and April 2020 in Micro labs Pvt Ltd, Bengaluru.

### Method of data collection

Information was gathered directly from the individual doctor through the questionnaire and the interview method.

## RESULTS AND DISCUSSION

As Indicated in Figure 1. 40% of doctors observe <5 cases of complicated intra-abdominal infections in their practice every week. 45% of doctors observe 5 to 10 cases of complicated intra-abdominal infections in their practice every week. It explains about the No of cases of complicated Intra Abdominal Infections observed in clinical practice every week. X-axis: No of Cases, Y-axis: No of Doctors. In this analysis feedback of 128 doctors has been collected and the compilation of collected data is done. The results are analyzed and compared with each other. 51 doctors observe <5cases, 57 observe 5 to 10, 9 doctors observe 10 to 20 and 11 doctors observe >20 cases of complicated intra abdominal infections every week.



**Figure 1: Analysis of the Number of cases of complicated Intra Abdominal Infections.**

As Indicated in Figure 2. 71% of the doctors observe <5 cases of complicated skin & skin structure infections in their practice every week. It explains about the number of cases of complicated skin and skin

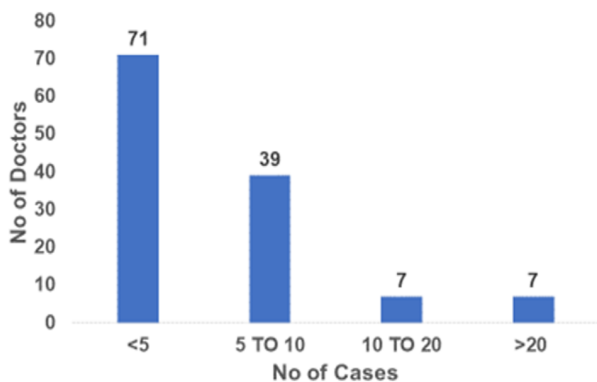


Figure 2: Analysis of Number of cases of complicated Skin & Skin structure Infections.

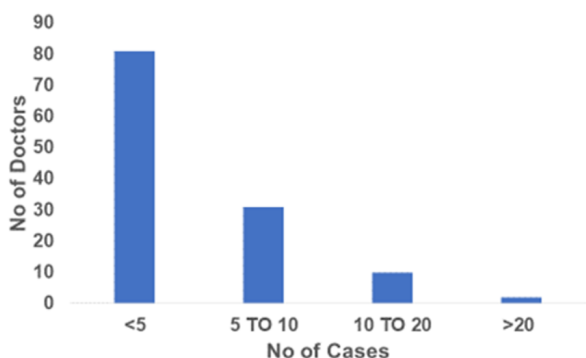


Figure 3: Analysis of Number of cases of bacterial meningitis in practice every week.

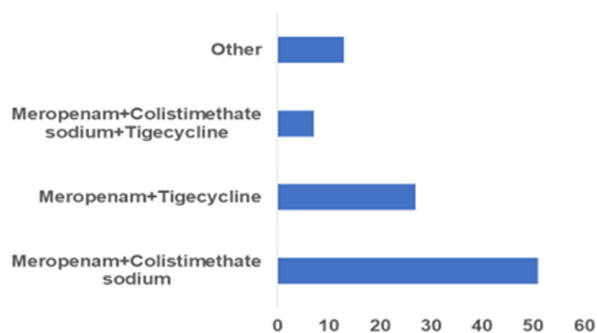


Figure 4: Analysis of combination of drugs treatment of sepsis.

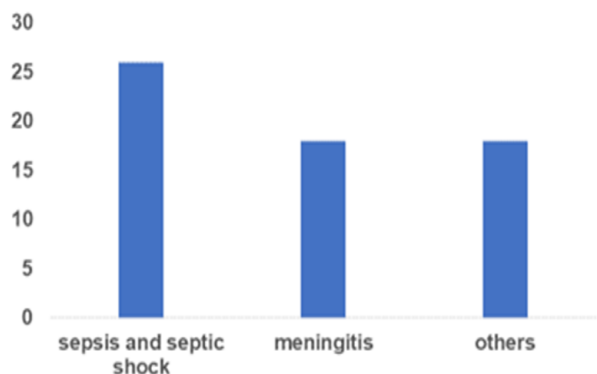


Figure 5: Analysis of different conditions in which they prescribe Meropenem for more than 10 days.

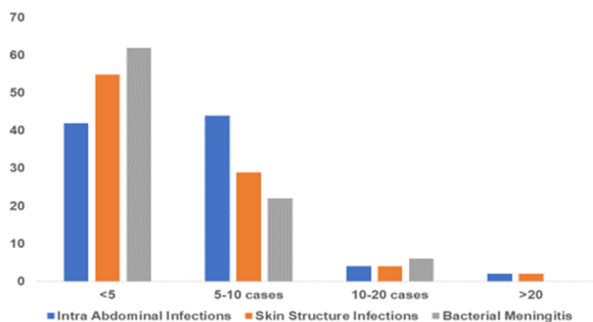


Figure 6: Comparison of infections in <50 bedded ICU'S.

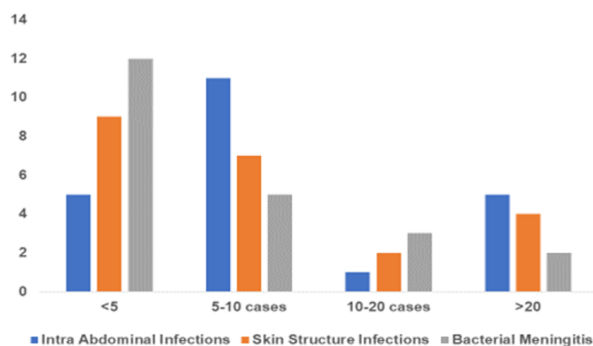


Figure 7: Comparison of infections in 50-100 bedded ICU'S.

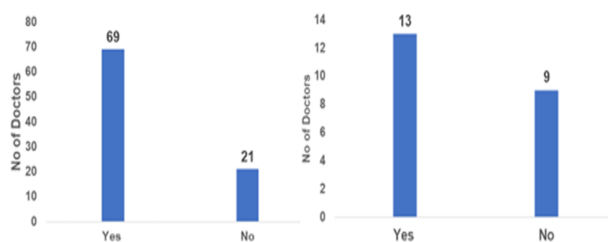


Figure 8: Percentage of Doctors prescribing Meropenem (MicroLabs brand of Micropenam) <50 and 50-100 bedded ICU'S.

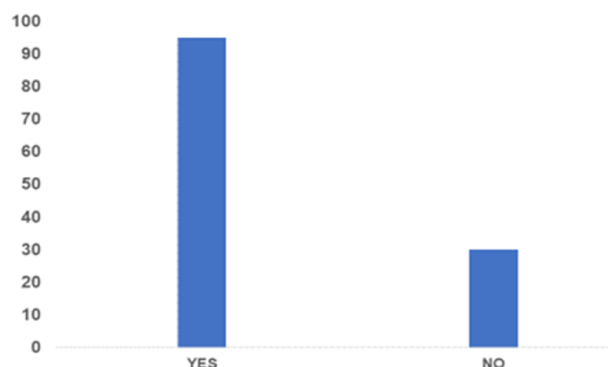


Figure 9: Analysis on Prescribing Micropenam Brand of Micro Labs.

structure infections observed in clinical practice every week. X-axis: No of cases Y-axis: No of doctors. In this analysis feedback of 124 doctors is collected and the compilation of data is done. The results are analyzed and compared with each other. 71 doctors observe <5 cases, 39 doctors observe 5 to 10 cases, 7 doctors observe 10 to 20 cases and 7 doctors observe >20 cases every week in their clinical practice.

As Indicated in Figure 3. 65% of doctors observe <5 cases of bacterial Meningitis in their practice every week. It explains about the number of cases of bacterial infections observed in clinical practice every week, X-axis: No of cases, Y-axis: No of doctors. In this analysis feedback of 124 doctors is collected and the compilation of data is done. The results are analyzed and compared with each other.

As Indicated in Figure 4. 52% of the doctors combine meropenem with colistimethate sodium in the treatment of sepsis. 30% of the doctors use tigecycline as a preferred combination with meropenem. It explains about the different combination of drugs preferred in the treatment of sepsis X-axis: No of doctors Y-axis: combination of the drugs. In this analysis feed back of 98 doctors is collected and the compilation of data is done. The results are analyzed and compared with each other.

51 doctors prefer meropenem+colistimithate sodium, 27 doctors prefer meropenem+ tigecycline, 7 doctors prefer meropenem+ colistimithate+ tigecycline, 13 doctors prefer other combination of drugs combining with meropenem in the treatment of sepsis.

As Indicated in Figure 5. The conditions doctor prescribe meropenem for more than 10 days: Sepsis and septic shock, meningitis, blood stream infections, complicated UTI, intra abdominal infections, multiple organ dysfunction and polynephritis. It explains about the different conditions in which they prescribe meropenem for more than 10 days, X-axis: Disease condition, Y-axis: No of doctors. In this analysis feedback of 62 doctors is collected and the compilation of data is done. The results are analyzed and compared with each other. 25 doctors prescribe meropenem in the cases of sepsis and septic shock, 18 doctors prescribe meropenem for the patients in the meningitis, and few doctors also prescribe in other different conditions.

As Indicated in Figure 6. It explains about the Comparison of infections in <50 bedded ICU'S, X-axis: Number of cases Y-axis: No of doctors, By comparison of 3 different approved indications all the 3 conditions i.e, intra abdominal infections, skin and skin structure infections, bacterial meningitis are seen in

10 cases approximately every week in <50 bedded ICU'S every week.

As Indicated in Figure 7. It explains about the Comparison of infections in 50-100 bedded ICU'S X-axis: Number of cases; Y-axis: No of doctors. By comparison of 3 different approved indications all the 3 conditions i.e, skin and skin structure infections, bacterial meningitis are seen in 10 cases approximately every week in 50-100 bedded ICU'S. As Indicated in Figure 8. It explains about the percentage of the doctors who prescribe Meropenem in <50 & 50-100 bedded ICU'S. By comparison of <50 and 50-100 Bedded ICU's 76% of the doctors prescribe Meropenem in <50 bedded ICU's and only 59% of the doctors prescribe Meropenem in 50-100 bedded ICU's.

As Indicated in Figure 9. It explains about the prescribing behavior of the Meropenem (Micro Labs brand of Micropenam). In this analysis the feed back from 120 doctors is collected, and compilation of the given data is done and the results are analyzed and compared with each other. In this 95 doctors says yes and 30 doctors they say no. By this analysis results we can see that the 76% of the doctors prescribe the Meropenem (Micro Labs brand of Micropenam).

## CONCLUSIONS

The study carried out on analyzing the various types of Infections Caused and the drug choices for these Infections. The use of Antibiotic Meropenem for various Infections. The Findings suggested that the Majority of the Medical Practitioners Preferred Prescribing Meropenem. To sum up it was found by Opinion of Doctors that Antibiotic Meropenem can be effectively used as a Preferable Antibiotic to treat the different kind of Infections.

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## Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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