Review of: "Meropenem Usage Assessment amid the Antibiotic Resistance Crisis: A Comprehensive Analysis in a Tertiary Care Hospital in Pakistan"

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Potential competing interests: No potential competing interests to declare.

Abstract

1. **Detailing Key Findings**: While the abstract presents results, it lacks specificity about the methodology and significant gaps identified. Including brief insights into issues like the lack of stewardship involvement or daily appropriateness checks would strengthen its impact.

Introduction

1. **Scientific Depth**: The introduction still needs more relevant references.

Specifically:

- How does empirical prescribing correlate with resistance emergence, especially for meropenem?
- Are there regional studies highlighting resistance patterns in Pakistan or similar healthcare systems?
- A gap exists in discussing how this study aims to bridge the understanding of usage patterns and resistance mitigation.

1. **Research Gaps**: Establish a direct connection between inappropriate meropenem usage and its impact on resistance. Without this, the study lacks relevance.
2. **Focus on Resistance Patterns**: The introduction should specify how empirical meropenem use relates to resistance development in specific pathogens like *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, or *Acinetobacter baumannii*.

Methods

In the study design and population, it is mentioned that 16 years and above were considered for the study. Are 16 years of age legally adults in your setting, or was assent taken if not?

1. **Importantly, statistical methods used should be described in the methods section.**
2. **Guidelines for Creatinine Clearance Adjustments**: State which guidelines or references (e.g., UpToDate, Stanford Antimicrobial Therapy Guide) were used for dose adjustments. If none were followed, this gap should be acknowledged.
3. **Therapy Modifications**:

- Explain how therapy was modified in 95% of cases. Provide data on:
  - **Dose adjustments**: How often were doses changed, and in what manner (e.g., reduced, increased)?
  - **Duration changes**: What percentage of modifications involved correcting inappropriate treatment duration?
  - **Drug additions/removals**: Were these changes based on clinical response or resistance data?

4. **Stewardship Process**:
   - Detail whether a structured antimicrobial stewardship process was in place. If not, who monitored therapy modifications (e.g., attending physicians, pharmacists)?
   - Were modifications made based on feedback from a stewardship or ID team?

Results

1. **Organisms and Resistance Patterns**:
   - From the 73% of cases where cultures were obtained, mention:
     - The organisms isolated.
     - Their susceptibility or resistance to meropenem.
   - Discuss whether resistance was seen predominantly in specific organisms (e.g., ESBL-producing *Enterobacteriaceae* or carbapenem-resistant *Pseudomonas*).
2. **Therapy Modifications**:
   - Provide a breakdown of the types of modifications in 95% of cases:
3. **Appropriateness Alignment**:
   - Specify how appropriateness was assessed and aligned with clinical guidelines. Was any criteria used, like the 5R's criteria for stewardship?
   - Highlight gaps, such as whether inappropriate duration correlated with worse outcomes.
4. **Stewardship Team**:
   - If no stewardship team was in place, mention who reviewed appropriateness and whether this was part of a formal review process.

Discussion

1. **Resistance and Organisms**:
   - Discuss the implications of isolated organisms and their resistance patterns on empirical prescribing practices.
   - Were the resistance patterns predictable based on hospital antibiograms or regional trends?

2. **Therapy Modifications**:
    - Elaborate on the nature of therapy modifications and their outcomes:
        - Did dose adjustments improve clinical outcomes?
        - How often were duration corrections made, and what impact did they have?
        - Were added or removed drugs based on culture results or empirical reasoning?
3. **Stewardship Process**:
    - Highlight the absence of a formal stewardship process (if applicable) and its potential impact on therapy appropriateness.
    - Compare findings to hospitals with active stewardship programs and discuss how a formal process might improve outcomes.

Figures

1. To the existing figures, captions should be added.
2. **Therapy Modifications**:
    - Add a figure or table illustrating the breakdown of therapy modifications (dose adjustments, duration changes, and additions/removals).
3. **Organisms and Resistance**:
    - Include a figure or table summarizing organisms isolated and their susceptibility patterns.
    - If data is not available, this absence should be explicitly noted and discussed as a limitation.

Limitations

1. **Resistance Data**:
    - Acknowledge if resistance patterns were not comprehensively analysed and explain how this limits the study's conclusions.
2. **Stewardship Gaps**:
    - Highlight the lack of a formal antimicrobial stewardship process (if true) as a significant limitation.

Conclusion

1. **Actionable Steps**:
    - Emphasize the need for a stewardship process to oversee appropriateness, therapy modifications, and resistance monitoring.
    - Recommend routine reporting of resistance patterns to guide empirical and culture-guided therapy.