Is usage of colistimethate sodium in pediatric oncology practice rational or rampant? -
A self audit of tertiary care centre

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Disclosure

- Nothing to disclose
Introduction

• Multidrug resistant (MDR) gram negative bacterial (GNB)
  • Common in pediatric oncology practice
• Rate of resistance in our unit
  • $\beta$-lactam/$\beta$-lactamase inhibitor (BL/BLI) - 66%
  • Carbapenem (CB) - 50%
• Only life line left behind is colistimethate sodium (CS)
  • Irrational usage of CS - predispose the development of resistance.
• Self auditing of CS administration
  • Provides measure of its rationality in usage
Aims and objectives

• To audit - CS administration in our unit
  • The frequency
  • The indication

• To evaluate -
  • The outcome of febrile neutropenia episode (FNE) following CS administration.
Methodology

- FNE - between January 2016 and July 2017
  - Retrospective analysis.
- 924 FNE was observed during study period
- FNE treated with CS (n=116/924) was 12.3%
- Surveillance stool culture was performed
  - At diagnosis of malignancy in leukemic children.
- De-escalation approach
  - Past history of MDR GNBI
  - Surveillance stool culture had MDR GNBI
Methodology

• CS was never administered in isolation
  • Administered either with carbapenems or tigecycline.
• CS given as infusion over 1 hour during all FNE

• Definitions
  • MDR: Non-susceptibility (intermediate or resistant) to at least 1 agent in 3 different class of antibiotics
  • Underweight; Weight for age < -2 Z score for age and sex in WHO growth chart
  • Stunting: Height for age < -2 Z score for age and sex in WHO growth chart
Results

- De-escalation approach-14 (12.1%) episodes
- At initiation of CS (IQR)
  - Duration of neutropenia-6 (5-10) days
  - Duration of FNE- 4 (3-5)days
  - ANC - 200 (100-400)/mm$^3$
- Co-morbidity
  - Underweight in 41 (35.3%)
  - Stunting in 28 (24.1%)
Results - Indication for CS initiation

- Clinical sepsis - 46 (40.3%) episodes
- Microbiologically documented infection (MDI) - 39 (33.6%) episodes
  - 33/39 (84.6%) episodes were by MDR GNB isolates
    - 18/33 - E.coli
    - 12/33 - K. Pneumonia
    - 3/33 - P.aeruginosa
- Previous MDI/ surveillance + ve by MDR isolates - 14 (12.1%) episodes
- Clinically documented infection (CDI) - 8 (6.8%) episodes
- Severe sepsis - 9 (7.4%) episodes
Results - primary malignancy

- Acute myeloid leukemia - 62
- Acute lymphoblastic leukemia - 42
- Non- Hodgkins Lymphoma - 9
- Other malignancies - 3.
Results - outcome

- Duration of CS administration was 14 (8-16) days
- Defervescence was attained in 102 (87.9%) FNE
  - Interval of 10.9 ±5.7 days
- 14 (12.1%) FNE culminated in mortality
  - Severe septicemia due to GNB isolates in 11
  - Clinical infection of respiratory tract in 3
- All the children who succumbed were managed with escalation approach
- Mortality was associated with stunting (P=0.03)
Conclusion

• CS was administered in 12% of FNE
• 2/5 times CS was initiated for clinical sepsis.
  • These FNE could have been due to malignancy or occult infection.
  • Robust biomarkers or clinical risk stratified approach to identify underlying malignancy or occult sepsis
• Children with stunting are expected to have poor outcome despite usage of CS and other broad spectrum antibiotics.
• Surveillance stool cultures to identify MDRI may guide us in utilizing antibiotic de-escalation approach.