

Cumulative antibiogram and retrospective chart review of pediatric antibiotic stewardship at Barnersville Junction Hospital: Monrovia, Liberia

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Background

Sepsis and antimicrobial resistance are major causes of pediatric mortality (Rudd KE, 2020 Jan 18)(Y, 2025)). Cumulative hospital antibiograms can provide crucial insight into antimicrobial resistance patterns, yet important gaps remain in understanding how to use these findings to update empiric treatment for suspected sepsis.

Methods

A retrospective chart review was conducted on bacteraemic children (1 month–15 years) admitted to Barnersville Junction Hospital in Monrovia, Liberia (July 2019–September 2022). The WHONET laboratory database supplemented clinical data. The study evaluated the appropriateness of empiric and targeted treatment (based on adherence to guidelines, or clinical review), and the origin of infection (community versus nosocomial).

Results

The study included a total of 444 patients, of which 53% (n=235/444) were male, and 50% (n=219/444) were <1 year of age. Of these, 377/444 (85%) of charts had sufficient clinical data for appropriateness of treatment analysis. The cohort was severely ill [39% (n=86/223 of MUAC eligible) severely malnourished and 72% (n=259/377) admitted to the ICU] and faced a very high mortality rate at 36% (n=137/377). Suspected sepsis was the primary reason for blood culture.

Treatment was appropriate in 78% of empiric and in 66% of targeted prescriptions. Community-acquired infections accounted for 53% (n=248/444) of the cohort, whereas nosocomial infections accounted for 31% (n=143/444). Multi-drug-resistant organisms were present in 20% of patient samples, of which 63% were resistant to penicillin/cephalosporin (ESBL) and 22% to carbapenem (CRO). The most common pathogens were *Klebsiella* spp (n=107, 23%), *Escherichia coli* (n=45, 11%) and *Staphylococcus aureus* (n=42, 9%).

Conclusion

Clinicians successfully followed empiric treatment guidelines but there is room for improvement in appropriately administering targeted treatment. Nosocomial infections as well as multi-drug-resistant infections were both very common. The study findings support changing first line empiric treatment of suspected sepsis in this population and more closely monitoring implementation of antibiotic stewardship programs.

Cumulative antibiograms are a crucial tool in understanding antimicrobial resistance but additional clinical information is needed to effectively update empiric treatment for suspected sepsis. Among a high burden of multi-drug resistant, and nosocomial infections, clinicians at BJH in Liberia effectively follow empiric treatment guidelines but support is needed to correctly implement targeted treatment.