Antimicrobial Stewardship Audits in Central Health: De-Escalation of Meropenem

Choosing Wisely Canada Recommendation

Don't start or prolong broad-spectrum antibiotic treatment unless clinically indicated.

Objective

Interventions such as audit and feedback are core elements of hospital antimicrobial stewardship programs. Central Health (CH) performed an audit on antibiotic de-escalation of meropenem.

Practice Points

1. De-escalation is the process whereby the empiric antibiotic(s) are stopped or narrowed in spectrum of activity based on antimicrobial susceptibility testing reports. This typically occurs on about the third day of antimicrobial therapy. De-escalation aims to reduce selection of antimicrobial resistant bacterial flora by lowering antibiotic pressure, reduce risk of adverse drug effects and decrease costs.

2. Meropenem is an antimicrobial with activity against P. aeruginosa and extended spectrum beta-lactamase (ESBL)-producing organisms. It is frequently used for severe bacterial infections such as pneumonia, febrile neutropenia, intra-abdominal infection, urinary tract infection, and polymicrobial skin and soft tissue infections. Since it possesses a broad spectrum of activity, meropenem is used extensively as empirical therapy for life-threatening infections and should be immediately de-escalated if the identified pathogen does not require such treatment or stopped if the illness process is found to be non-infectious in nature.

3. Inappropriate use of broad-spectrum antimicrobials such as meropenem can be reduced without harming patient outcomes.

Methods (J. Bautista and N. Power)

A one-year audit (Jan 1 – Dec 31, 2020) was conducted on all adult, non-obstetrical inpatients at all Central Health facilities to determine: 1) if bacterial culture and susceptibility (C&S) testing was ordered on those patients prescribed meropenem and 2) if meropenem was de-escalated based on C&S results.

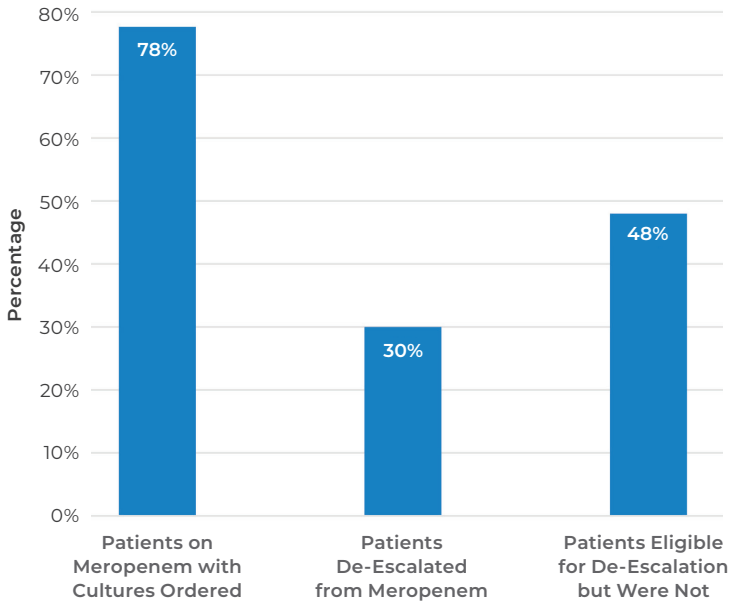

Figure 1. Meropenem De-Escalation Audit Results 2020 (n=94)

- A total of 94 patients were ordered meropenem during the audit period. Of these, 73 patients (78%) had bacterial C&S tests ordered. Of the 73, 28 patients (30% total) had meropenem narrowed to more targeted therapy (e.g., ciprofloxacin and metronidazole) or had meropenem discontinued following the reporting of C&S testing results and 45 patients (48%) could have had meropenem de-escalated or discontinued based on C&S testing results.

Conclusions

1. Patients for whom broad-spectrum antibiotics such as meropenem are being prescribed should have bacterial C&S collected to allow for potential de-escalation to targeted narrower-spectrum antibiotics or discontinuation of antibiotics. This audit revealed broad-spectrum antibiotic use without concomitant culture occurs in more than 20% of cases in the context of meropenem use. This is suboptimal from an antimicrobial stewardship and medical care perspective.

2. The observed rate of infections which exclusively require meropenem in CH is low. This is a useful factor when considering empiric antibiotic therapy.

3. This audit showed that de-escalation following empirical treatment with meropenem represents a significant opportunity for improvement in antibiotic use. Due to specific patient history and clinical presentation, it is acknowledged that meropenem may have been an appropriate agent, despite the C&S results reported. However, identification of reasons that led clinicians to forego de-escalation in context where microbiological C&S results support it was beyond the scope of this audit.

4. Prescribers are encouraged to utilize available local antimicrobial susceptibility patterns to select empiric treatment regimen.

5. Prospective audit and feedback to prescribers is a type of antimicrobial stewardship initiative that could improve antibiotic use in CH.