Know Which Patients Are Prone to Faster Renal Clearance

You'll hear buzz about antibiotic dosing in patients with "augmented renal clearance" (ARC)...or higher clearance than normal.

Up to two-thirds of general ICU patients may have ARC...a creatinine clearance above 130 mL/min...usually during their first week in the ICU.

The concern is that ARC may lead to inadequate antibiotic blood levels...due to faster clearance of meds.

But put this in perspective. Most evidence suggests ARC isn't associated with worse outcomes...possibly because it often lasts a few days or less. And some experts think ARC is a marker for patients more likely to recover from critical illness.

Also, confirming ARC can be complex. Cockcroft-Gault or similar equations can underestimate it, so you need a timed urine creatinine...which can be cumbersome for nurses and subject to error.

For now, use risk factors to identify possible ARC patients...and consider the entire clinical picture when evaluating antibiotic dosing.

Think about ARC in critically ill patients who are younger and male with minimal organ dysfunction and normal or low serum creatinine.

Also suspect ARC in patients with trauma, neuro injuries, burns, or early sepsis...since ARC may be triggered by increased cardiac output or possibly loss of brain autoregulation.

Evaluate antibiotic dosing for possible ARC patients using the organism, MIC, infection site, clinical response, etc. Traditional dosing may be adequate for a less severe infection, especially with a low MIC.

But maximize antibiotic dosing for severe infections in these patients. For example, consider high-dose extended infusions...such as meropenem 2 g IV over 3 hours given every 8 hours or piperacillin/tazobactam 4.5 g IV over 4 hours given every 6 hours.

Monitor vancomycin and aminoglycoside levels closely to keep them in goal range...and prevent toxic levels that could occur once ARC resolves.

See our chart, Augmented Renal Clearance: FAQs, for more on ARC risk scoring and approaches for managing these patients.

Key References:
- Pharmacotherapy 2015;35(11):1063-75
- Clin Pharmacokinet 2018;57(9):1107-21
- Crit Care 2013;17(1):R35

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