Kentucky Antimicrobial Stewardship Innovation Consortium

Educational Pearl

Don't Let the Bug Beat You: Viridans Group Streptococci

Viridans Group Streptococci (VGS) are a diverse group of alpha-hemolytic (incomplete hemolysis, appears green on blood agar) and gamma-hemolytic (no hemolysis) *Streptococcus* spp. that colonize the oropharynx and gastrointestinal tract. Specific organisms include *S. salivarius* group, *S. mitis* group, *S. anginosus* group, and *S. bovis* group. VGS are pathogens in subacute bacterial endocarditis, dental infections, aseptic meningitis, and septic arthritis. Primary bacteremia may occur from GI translocation in neutropenic cancer patients undergoing chemotherapy.[1] Firstline treatment is typically a beta-lactam like penicillin or ceftriaxone, however are all beta-lactams useful in treating VGS infections?

Can you use cephalexin for VGS infections?

There are no Clinical and Laboratory Standards Institute (CLSI) breakpoints for VGS and cephalexin. VGS susceptibility to other beta-lactams such as penicillin or ceftriaxone do not predict cephalexin activity. In one study of 352 VGS isolates, 96% of isolates had a cephalexin minimum inhibitory concentration (MIC) of ≥ 2 µg/mL.[2] Optimal pharmacokinetic-pharmacodynamics targets are unlikely to be achieved with a MIC exceeding 2 µg/mL, even with high-dose cephalexin dosed at 1 gram every 6 hours.[3]

Can you use cefazolin for VGS infections?

There are no CLSI breakpoints for VGS and cefazolin. Cefazolin MICs against VGS are often under 2 µg/mL (CLSI *E. coli* susceptible breakpoint for cefazolin), however they can range to > 8 µg/mL, particularly with *S. mitis*.[4] In one large study of VGS susceptibility rates reported from Veterans Affairs Medical Centers in the United States from 2010 to 2020, cefazolin was commonly reported to be susceptible, however susceptibility interpretation was institution specific and a specific threshold was not reported or clearly consistent between institutions.[5]

Key Takeaway: Cephalexin has unreliable activity against VGS. Cefazolin may be an option, but its role is not well informed. VGS susceptibility to penicillin or ceftriaxone does not predict 1st generation cephalosporin activity.

References:

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