HNELHD Cumulative Antibiograms 2019: Peel Commentary

Blood Cultures

The Therapeutic Guidelines: *Antibiotics* recommends gentamicin and flucloxacillin with the addition of vancomycin for patients with increased risk of MRSA and the addition of ceftriaxone for patients with suspected *Neisseria meningitidis* infection for the empirical treatment of adults presenting with community-acquired sepsis or septic shock without an apparent source of infection.

The predominant pathogens isolated from blood cultures collected in the Peel Sector were *Escherichia coli* and *Staphylococcus aureus*. *Escherichia coli* isolates demonstrated very high rates of susceptibility to gentamicin (92% susceptibility) and the *Staphylococcus aureus* isolates demonstrated high rates of susceptibility to flucloxacillin (88% susceptibility) and vancomycin (100% susceptibility).

Another Gram-positive organism of note that was isolated included *Streptococcus pneumoniae* (18 cases so not reported officially). The breakpoint for penicillin susceptibility for treating *Streptococcus pneumoniae* meningitis is an MIC ≤ 0.06 mg/L. Pneumococcal infections outside the central nervous system with MICs ≤ 2 mg/L will respond to high dose penicillin or other narrow spectrum β-lactam antibiotics.

No meropenem-resistant carbapenemase-producing *Enterobacterales* (CPEs; previously known as carbapenemase producing *Enterobacteriaceae*) organisms were isolated from the blood clinical isolates in the Peel Sector.

Urinary Isolates

The Therapeutic Guidelines: *Antibiotics* recommends: trimethoprim or nitrofurantoin as first-line empiric therapy for the treatment of acute uncomplicated cystitis in non-pregnant women; amoxicillin/clavulanate or trimethoprim or cefalexin or trimethoprim/sulfamethoxazole for the treatment of non-severe pyelonephritis in adults (non-pregnant); and intravenous therapy with ampicillin and gentamicin for severe pyelonephritis in adults (non-pregnant).

The predominant pathogen isolated from urine samples collected in the Peel Sector was *Escherichia coli* which demonstrated high rates of susceptibility to first line oral agents for cystitis and non-severe pyelonephritis (85% trimethoprim susceptibility, 97% nitrofurantoin susceptibility and 95% cefalexin susceptibility). The isolates had mixed susceptibility to first line intravenous therapy options for severe pyelonephritis (97% gentamicin susceptibility and 65% ampicillin susceptibility). However, when provided as combination therapy (in accordance with guideline recommendations), ampicillin and gentamicin provided effective coverage for likely causative organisms and remain recommended for use.

Other Gram-negative organisms frequently isolated included: *Klebsiella* species, *Proteus mirabilis,* other *Enterobacterales* and *Pseudomonas aeruginosa*. *Klebsiella* species isolates showed complete susceptibility to the first line intravenous option gentamicin (100% susceptibility) and high susceptibility to cefalexin and augmentin (91% and 94% susceptibility respectively) as a suitable oral options. Isolates of *Pseudomonas aeruginosa* isolates demonstrated very high rates of susceptibility to the first line intravenous therapy option (99% gentamicin susceptibility) as well as ciprofloxacin and norfloxacin as suitable oral options (95% and 96% susceptibility respectively).

Enterococci were the predominant Gram-positive organism isolated from urinary samples and demonstrated high rates of susceptibility to first line oral agents (90% amoxicillin susceptibility and 90% nitrofurantoin susceptibility) and empiric intravenous therapies (90% ampicillin susceptibility).

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For details of the methods used in this analysis see Cumulative Antibiograms 2019: Overview.
Other Isolates Commentary

The Cumulative Antibiogram for "Other Isolates" provides summary data of antibiotic resistance patterns for organisms obtained from sites other than blood and urine. Chiefly these bacteria are collected from skin, soft tissue, respiratory track and surgical sites.

The predominant pathogen isolated from the samples collected in the Peel Sector was *Staphylococcus aureus*. The Therapeutic Guidelines: *Antibiotics* recommends flucloxacillin as first-line empiric therapy for the treatment of most skin and soft tissue infections for patients who are not at increased risk of community-associated methicillin-resistant *S. aureus* (MRSA). The samples demonstrated high rates of susceptibility to flucloxacillin (81% susceptibility) as the recommended first line oral agent and cefalexin as the second line agent recommended for use in penicillin hypersensitivity. First line oral agents for the treatment of MRSA demonstrated high rates of susceptibility (83% clindamycin susceptibility, 99% sulfamethoxazole/trimethoprim susceptibility and 97% doxycycline susceptibility).

Another Gram-positive organism of note that was isolated included *Streptococcus pneumoniae*. The breakpoint for penicillin susceptibility for treating *Streptococcus pneumoniae* meningitis is an MIC ≤ 0.06 mg/L; 100% of the isolates tested were susceptible to benzylpenicillin. Pneumococcal infections outside the central nervous system with MICs ≤ 2 mg/L will respond to high dose penicillin or other narrow spectrum β-lactam antibiotics.

The most frequently isolated Gram-negative organisms were *Haemophilus influenzae*, *Escherichia coli* and *Pseudomonas*. The *Haemophilus influenzae* isolates (likely respiratory sources) had high rates of susceptibility to ceftriaxone (97%) and amoxicillin/clavulanate (91%). Isolates of *Pseudomonas aeruginosa* isolates demonstrated very high rates of susceptibility to the first line intravenous therapy option (97% gentamicin susceptibility) as well as ciprofloxacin and norfloxacin as suitable oral options (95% and 96% susceptibility respectively).

No meropenem-resistant carbapenemase-producing *Enterobacterales* (CPEs) organisms were isolated from the other clinical isolates in the Peel Sector.

For details of the methods used in this analysis see Cumulative Antibiograms 2019: Overview.