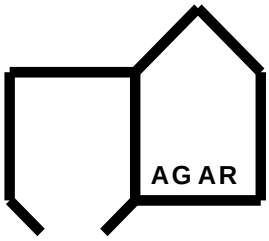

The Australian Group on Antimicrobial Resistance

http://antimicrobial-resistance.com

The Gram-negative Sepsis Outcome Program 2020

Progress Report

Objectives

The objectives of Gram-negative Sepsis Outcome Program 2020 are to monitor resistance, examine the extent of co-resistance and multi-resistance; and to detect emerging resistance to newer last-line agents such as carbapenems.

Progress (data as at 27nd January 2021)

Data for the third quarter of 2020 is in progress, with 91% of expected data received. Thirty-nine institutions across Australia have reported a total of 6,391 isolates (*Enterobacterales* *n* = 5,745, *P. aeruginosa* *n* = 566, *Acinetobacter* spp. *n* = 80) from different patient episodes of bacteraemia collected during 2020. *Escherichia* spp., *Klebsiella* spp., *P. aeruginosa* and *Enterobacter* spp. contributed 87.6% of all isolates.

Susceptibility Data

Antimicrobial MICs were determined at each institution using commercial systems, Vitek® 2 (BioMérieux) or Phoenix™ (BD). The results were analysed using EUCAST breakpoints.

Resistance to ceftriaxone was to 13.7% of *E. coli*, 8.5% of *K. pneumoniae* complex. An ESBL phenotype was observed in 14.9% of *E. coli* and 10.5% of *K. pneumoniae* complex. The proportion of *E. coli* and *K. pneumoniae* complex with acquired AmpC resistance phenotype (ceftazidime resistant and cefoxitin MIC > 8 mg/L) was low (4.4% and 5.1% respectively). Over 9.0% of *E. coli* and 5.5% of *K. pneumoniae* complex were resistant to gentamicin.

Resistance rates to ciprofloxacin was 17.0% for *E. coli*, 10.3% for *K. pneumoniae* complex, and 6.0% for *E. cloacae* complex.

Meropenem non-susceptibility among *Enterobacterales* was 0.5% overall, and 4.5% in *Enterobacter cloacae* complex. Meropenem resistance (MIC > 8 mg/L) was 3.4% (19/555) among *P. aeruginosa*; and 0.0% (0/71) among *Acinetobacter baumannii* complex. Tests for demonstration of carbapenemase activity and molecular characterisation of these strains is in progress.

Clinical outcomes

The sex ratio (number of males to 100 females) was 114 for all bacteraemia's. Overall, 22.5% of episodes were designated hospital-onset (HO) with the first positive blood culture collected > 48 h after admission. While only 14.8% of *E. coli* was HO, 28.0% of *Klebsiella* spp. (range 22.0%, *K. variicola* to 41.9%, *K. aerogenes*), 46.0% of *E. cloacae* complex, 40.4% of *S. marcescens*, 36.3% *Acinetobacter* spp. and 49.6% of *P. aeruginosa* were HO.

Principal clinical manifestation (PCM) was available for 5,647 (88.4%) isolates. The most common PCM in the community-onset (CO) bacteraemia caused by *Enterobacterales* were urinary tract (48.2%) and biliary tract infection (17.6%). With HO bacteraemia, the PCM were urinary tract infection (21.1%), febrile neutropenia (21.1%). Outcome data was available for 4,665 (73.0%) inpatient episodes. A significant difference in 30-day all-cause mortality between CO and HO was seen with *E. coli* bacteraemia (9.0% vs 15.7%; $p<0.01$).

Outstanding Results

Data from two participating hospital has not yet been received but is available.

Final data is not expected until March 2021. Demographic data validation checks and requests for isolates for molecular testing are in progress and are on schedule to be finalised for the preliminary report due 31st July 2021.