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Paper Poster Session

Lessons from surveillance of resistance in Gram-negatives

Age related antimicrobial resistance

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Background: On-going epidemiological studies into the increase in *E. coli* bacteraemia in Wales¹ and the UK² show that the increase is occurring mainly in the elderly population >65 years. Interim results from the study in Wales, suggests that increased resistance in urinary pathogens in the elderly may be contributing to the increase in bacteraemias due to failures of initial empiric therapy. This paper investigates resistance by age group to a range of pathogens to determine the extent of age related resistance.

Material/methods: Antimicrobial susceptibility data for urinary coliforms; blood culture isolates; and specific pathogens *Staphylococcus aureus*, *Haemophilus influenzae* and *Streptococcus pneumoniae* isolates were extracted from LIMS via regional DataStore systems by age group (<2, 2-15, 16-29, 30-49, 50-64, 65-79, 80+). Duplicates were removed from the data sets prior to analysis.

Results: Antimicrobial resistance for community urines: There has been a significant increase and higher rates of resistance to trimethoprim in urinary coliforms in the 80+ age group in the past 10 years (34% in 2005 to 47% in 2014), compared with 27% in 2005 to 37% in 2014 in the general population. At the same time, increases in resistance associated with age and gender have been observed with fluoroquinolone resistance increasing from 10% to 19% in 80+ females, and from 12% to 23% in 80+ males. Whilst resistance to other agents have not increased, they remain higher in the older age groups e.g. in 2014, nitrofurantoin resistance for urinary coliforms (excluding *Proteus* spp.) was 14% in 80+ males compared to 3% in 16-29 year old males. **Blood cultures:** In *E. coli* bacteraemias there has been a significant increase in resistance in the >65 age groups to a number of first-line agents, including co-amoxiclav, gentamicin, fluoroquinolones, piperacillin/tazoctam and third generation cephalosporins. For *Streptococcus pneumoniae* macrolide and tetracycline resistance is significantly higher in the >65 age groups, and for *Staphylococcus aureus* resistance to flucloxacillin and macrolides is significantly higher in the >65 age groups. Further data will be presented.

Conclusions: General population resistance rates are the basis for most empiric guidance. However, antimicrobial resistance is increasing in the >65 age group and in particular the 80+ age group, and is often significantly higher than that quoted for the general population. With knowledge of these data and with an increasingly ageing population, we should consider establishing separate guidance for the empiric treatment of infection in older people for whom general guidance may no longer apply.

1. <http://www.wales.nhs.uk/sites3/page.cfm?orgid=457&pid=28906>
2. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/442059/hpr2315_ec_oli.pdf