

Temporal Trends in Ceftriaxone resistant *Escherichia coli* infections

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Background:

This study describes trends in ceftriaxone resistance in blood & urine isolates of *E. coli* in our health care system over a 10 year time period

Methods:

Kaiser Permanente Northern California (KPNC) is an integrated healthcare delivery system providing care to approximately 3.9 million members. All microbiological testing is performed at a centralized microbiology laboratory. Databases were queried for the time period between Jan1, 2004 to Dec 31, 2013. Blood and urine isolates of *E. coli* were classified as ceftriaxone-susceptible (CTx-S) or ceftriaxone-resistant (CTx-R), based on standard criteria. Infection rates were calculated per 100,000 member-years and adjusted for 2013 KPNC membership

Cases were classified into 3 mutually exclusive groups:

- Healthcare-associated, hospital onset (HCA-HO): cases where index specimen was obtained during a hospitalization but at least 48 hours after admission
- Healthcare-associated, community onset (HCA-CO): cases where index specimen was obtained a) within 365 days of hospital stay, out-patient surgery, dialysis; b) within 365 days of a known stay at a skilled nursing facility
- Community-associated (CA): infections which are neither HCA-CO or HCA-HO

Results

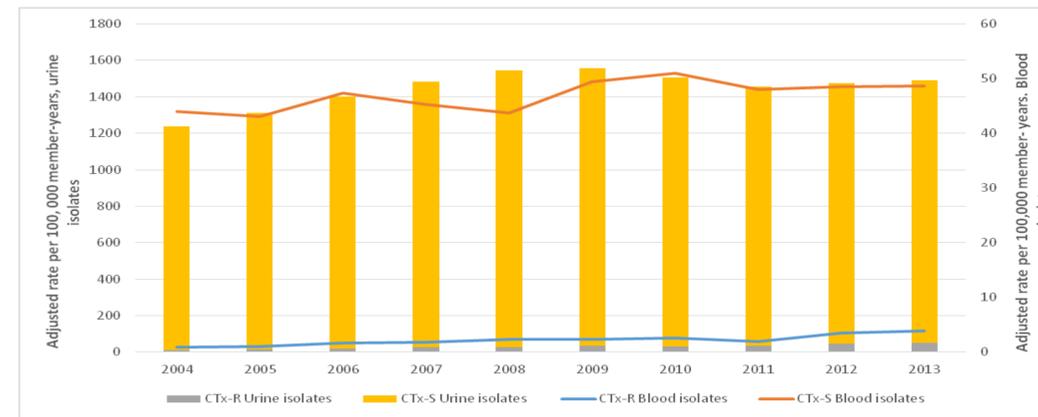


Figure 1: ceftriaxone susceptibility of *E. coli* isolates in blood & urine cultures, KPNC 2004-13

- Rates of CTx-R isolates increased by 3 fold for blood and by 3.5 fold for urine isolates over the study period
- Rates of CTx-S isolates remained stable over the study period for both blood and urine isolates

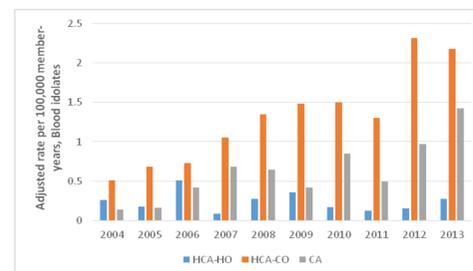


Figure 2: ceftriaxone resistant *E. coli* blood isolates, by group

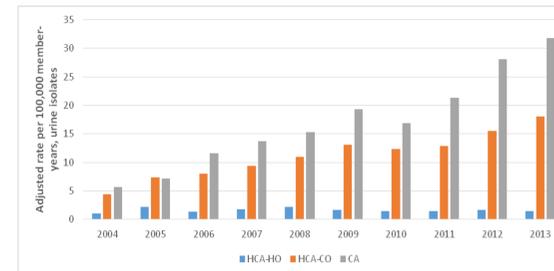


Figure 3: ceftriaxone resistant *E. coli* urine isolates, by group

- Blood isolates: Rates for CA onset cases increased by 9 fold; rates for HCA-CO cases increased by 3 fold. Rates for HCA-HO cases remained stable
- Urine isolates: Rates for CA onset cases increased by 4.5 fold; rates for HCA-CO cases increased by 3 fold. Rates for HCA-HO cases remained stable.

Results (continued)

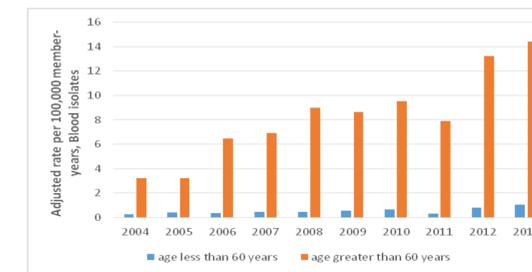


Figure 3: ceftriaxone resistant blood isolates, by age

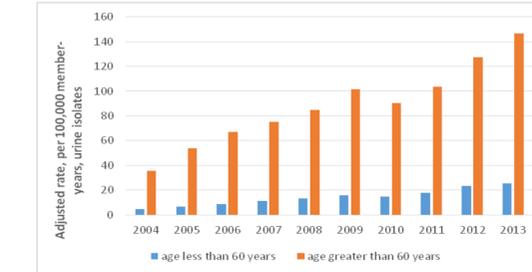


Figure 4: ceftriaxone resistant urine isolates, by age

- Rates of CTx-R isolates in blood and urine were higher in patients over the age of 60 years

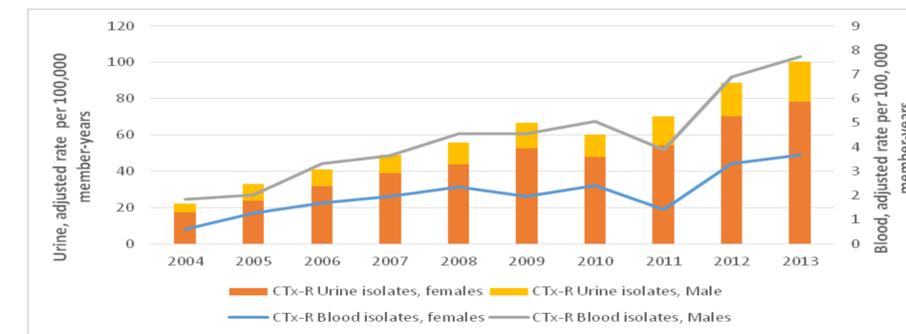


Figure 5: ceftriaxone resistant isolates in blood and urine, by gender

- Rates of ceftriaxone resistance in urine isolates were higher in women
- Rates of ceftriaxone resistance in blood isolates were higher in men

Conclusions:

Overall rates of ceftriaxone resistance in *E. coli* isolates were low. However, rates of ceftriaxone resistance increased significantly in CA and HCA-CO onset infections. Rates of ceftriaxone resistant isolates were higher in patients over 60 years. Men had higher rates of resistant blood isolates; women had higher rates of resistant urine isolates