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Poster Session IV
Resistance surveillance in Gram-negatives

STABILITY OF ERTAPENEM MICS OF ESCHERICHIA COLI IN EUROPE: SMART 2008-2012

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Objectives:

With extended-spectrum beta-lactamases (ESBLs) increasing worldwide and rendering many antimicrobial agents ineffective, ertapenem is widely used to treat intra-abdominal infections (IAI). Since *E. coli* is the most predominant species causing IAI, it is important to monitor its susceptibility to be aware of changes over time. The Study for Monitoring Antimicrobial Resistance Trends (SMART) has tracked susceptibility of aerobic Gram-negative IAI pathogens since 2002. This report analyzes ertapenem susceptibility trends of *E. coli* in Europe over 5 years for evidence of 'MIC creep'.

Methods:

7,460IAI isolates of *E. coli* (including 856ESBL+ strains) were collected from IAI at 47 sites in 10 European countries thatsubmitted at least 20 isolates each year between 2008 and 2012. Susceptibilityand ESBL phenotypes were determined using the CLSI broth microdilution method. MICswere evaluated for trend over time using Pearson's correlation betweencalendar years and log-transformed MIC values; trends in ESBL+ rates were assessed using theCochran-Armitage test. Infections were deemed community-associated (CA)or hospital-associated (HA) if specimens were collected <48 or >=48 hoursfrom admission, respectively.

Results:

ESBL+ rates and ertapenem susceptibility for *E. coli* are shown below for all IAI:

Year	n	% Susceptible	MIC_{50}	MIC_{90}	GM MIC	% ESBL+[1]
2008	1,400	99.9	<= 0.03	<= 0.03	0.034	11.1
2009	1,535	99.7	<= 0.03	<= 0.03	0.034	10.5
2010	1,493	99.5	<= 0.03	<= 0.03	0.034	10.2
2011	1,472	99.7	<= 0.03	<= 0.03	0.034	12.1
2012	1,560	99.7	<= 0.03	<= 0.03	0.035	13.3

[1] Significant trend for increasing % ESBL+ ($p<0.05$). No trend was seen for MICs. GM=geometric mean.

Geometric mean MICs were only very slightly higher in HA compared to CA IAI (0.036 versus 0.033 mg/L, respectively, in 2012), and there was no statistically significant trend found in MICs when stratifying by these types of IAI. The increase in ESBL+ *E. coli* was significant in HA IAI (from 13.5% in 2008 to 18.7% in 2012; p=0.003), but not in CA IAI (5.7% to 6.9%; p=0.108).

Conclusions:

- Ertapenem exhibited consistent activity against *E. coli* from 2008–2012 in IAI from Europe, with >99% of isolates susceptible in 2012. Both MIC_{50} and MIC_{90} remained <=0.03 mg/L.
- Similarly to other regions of the world, the ESBL+ rate for *E. coli* has increased significantly over the past 5 years in Europe, especially in HA infections.
- No significant 'MIC creep' was observed in the *in vitro* activity of ertapenem vs. *E. coli* from 2008-2012; however, monitoring of susceptibility should continue, especially since ESBLs and carbapenemases are increasing worldwide, further reducing therapy choices.