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Published In/Presented At

Kile, J., & Shastry, L. (2013). *A novel, network-wide outpatient generational urine antibiogram*. Poster presentation.

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A Novel, Network-wide Outpatient Generational Urine Antibiogram

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Background

Antibiograms are used to guide empiric antibiotic selection but do not take into account patient variables. In an effort to better assist our network's outpatient office practices, we hypothesize that an antibiogram based on age would produce varying susceptibilities and offer our providers valuable information to treat their patients. We designed a generational urine antibiogram to look at the susceptibility patterns, by age ranges, from urine isolates of our outpatient office practices.

Methods

One year of outpatient urine isolates and susceptibility data were retrieved and separated into age ranges as follows: age <20, 20-29, 30-39, etc. As per CLSI standards, 30 or more isolates of an organism and drug combination are considered significant. Fewer than 30 but greater than 10 isolates are included, demarcated in gray, and noted as being less statistically valid. The susceptibilities are color coded as the following: >90% is green, 70-89% is yellow, and <70% is red.

Results

E.coli was by far the most common pathogen throughout the age groups. *Enterococcus* species, *K. pneumoniae* and *P. mirabilis* provided a substantially smaller volume of isolates. *P. aeruginosa* did not appear until the 50-60 age range. Extended-Spectrum Beta-lactamase(ESBL) producers showed up in the 60-70 and 80+ age ranges, only.

In the outpatient setting, trimethoprim-sulfamethoxazole(TMP-SMX) and fluoroquinolones(FQs) are two of the most commonly used antibiotics for urinary tract infections. In the outpatient antibiogram, 15-20% of *E.coli* are resistant to TMP-SMX in all age groups; this is comparable to our inpatient urine antibiogram. FQs are active against *E.coli* for the age groups below 60; this is in contrast to our inpatient antibiogram. *E.coli* retains high susceptibility to cefazolin, and consequently, its oral equivalent cephalexin, throughout every age group; This is comparable to our inpatient antibiogram.

Conclusions

This novel, network-wide outpatient antibiogram provided differences in susceptibility when differentiated by age. In our opinion, cephalexin would be the appropriate choice for empiric treatment, when ESBLs and *P. aeruginosa* are not suspected. FQs can be used empirically, with >89 % susceptibility to *E.coli*, until the age of 70. A network-wide, outpatient generational urine antibiogram provides our clinicians a means to appropriately choose antibiotics based on age and outpatient status.

LVPG Urine Culture Antibiogram from Health Network Laboratories 2024 lehigh St - Allentown, PA 18103

Table showing urine culture antibiogram for ages <20. Columns include antibiotic classes like AMIKACIN, AMOXICAV, AMPICILLIN/AMOXICILLIN, etc. Rows include species like ENTEROCOCCUS SPECIES, ESCHERICHIA COLI, KLEBSIELLA PNEUMONIAE, and PROTEUS MIRABILIS. Susceptibility percentages are color-coded.

Urine Ages: 20-30 from 01/01/2012 to 12/31/12

Table showing urine culture antibiogram for ages 20-30. Similar structure to the <20 age group, showing susceptibility patterns for various species and antibiotics.

Urine Ages: 30-40 from 01/01/2012 to 12/31/12

Table showing urine culture antibiogram for ages 30-40. Shows the introduction of ESBL producers and changes in susceptibility for *E. coli*.

Urine Ages: 40-50 from 01/01/2012 to 12/31/12

Table showing urine culture antibiogram for ages 40-50. Continued tracking of *E. coli* and other pathogens.

Urine Ages: 50-60 from 01/01/2012 to 12/31/12

Table showing urine culture antibiogram for ages 50-60. First appearance of *Pseudomonas aeruginosa*.

Urine Ages: 60-70 from 01/01/2012 to 12/31/12

Table showing urine culture antibiogram for ages 60-70. High prevalence of ESBL producers.

Urine Ages: 70-80 from 01/01/2012 to 12/31/12

Table showing urine culture antibiogram for ages 70-80. Significant changes in antibiotic resistance.

Urine Ages: 80+ from 01/01/2012 to 12/31/12

Table showing urine culture antibiogram for ages 80+. Shows the most resistant profiles across various species.