

Initial antibacterial therapy with cephalosporins III in children with upper urinary tract infections: is this choice rational?

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Region or country of focus Russia

Empirical antibiotic choice in urinary tract infections aims at targeting the most probable causal pathogens. Due to growth of antibacterial resistance of uropathogens prescribing of cephalosporins III to children with UTI, including pyelonephritis, becomes widespread.

The objective of our study was to analyze whether the use of cephalosporins III as initial therapy in children with acute and chronic pyelonephritis was microbiologically/causally and clinically sound.

Study design Retrospective analysis of 118 medical charts of hospitalized patients aged 1 month – 18 years in whom cephalosporins III (ceftriaxone, cefotaxime, cefoperazone, cefixime) were used on admission, was carried out in parallel with analysis of 118 results of their urine bacteriology tests. Children were not treated with antibiotics prior to hospital admission. Urinary samples were collected prior to any antibiotic prescription. We excluded cases with negative bacteriology tests.

Results and lessons learned

Empirical therapy with cephalosporins III in children with pyelonephritis was not microbiologically justified in 85% of cases (n=100). In 22% of cases (n=26) isolated bacteria were resistant to cephalosporins III, these were enterococci and E.coli isolates, resistant to cephalosporins III and sensitive to aminoglycosides. In 63% of cases (n=74) bacterial isolates were sensitive to cephalosporins III (gram-negative pathogens), but were also sensitive to cephalosporins II, aminopenicillins and/or their combinations with beta-lactamase inhibitors.

Comparison of immediate clinical and laboratory outcomes of antibiotic treatment options of pyelonephritis in children revealed equal efficacy of aminopenicillins (including their combinations with beta-lactamase inhibitors), cephalosporins III and aminoglycosides.

Policy relevance or importance to public health or clinical medicine

Empirical use of cephalosporins III was not microbiologically justified in the majority of cases and posed additional risks to public health in terms of selection of resistant bacterial strains. Aminopenicillins (including their combinations with beta-lactamase inhibitors), cephalosporins II and aminoglycosides could be used alternatively.