Summary brief **October 2022**

High resistance to recommended antibiotics for treating urinary tract infections in Ghana: Is it time for a guideline review?

[1]Reference: Paper under review
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Key Messages

- Gram negative bacteria, mainly *Escherichia coli* and *Klebsiella spp*., were the commonest isolates that caused urinary tract infections.
- Over 60% multi-drug resistance (MDR) was observed among the most-common bacteria causing urinary tract infections in Ghana.
- High levels of resistance to nationally recommended antimicrobials for treating urinary tract infection, including cefuroxime, amoxiclav and ciprofloxacin, were observed.
- Urine specimens from men, older patients, originating from outside Accra and having antimicrobials present in the urine were factors associated with an increased risk of isolating an MDR organism.
- Current standard treatment guidelines for urinary tract infections (UTI) may not be effective in the face of high levels of resistance observed among isolated organisms, and this will require a review by the guidelines committee to reflect current resistance patterns.

What is the problem and why is it important?

Urinary tract infections (UTIs) are one of the leading causes of morbidity worldwide. Increasing antimicrobial resistance limits the options for treating urinary tract infections. There is limited data on antimicrobial resistance (AMR) among uropathogens (bacteria that cause urinary tract infection) in Ghana. Such data is useful for patient management and evaluation of treatment guidelines.

The "MDS-Lancet Laboratories" is the largest Private Medical Laboratory in Ghana with branches in 10 out of the 16 regions. The laboratory has data accumulated over the years which can serve as the evidence base for patient management, guideline evaluation and development. In this study, we describe antimicrobial resistance of uropathogens isolated from MDS-Lancet Laboratories over a five-year period.

MDR: Resistance to at least one antimicrobial agent from three or more classes of antibiotics

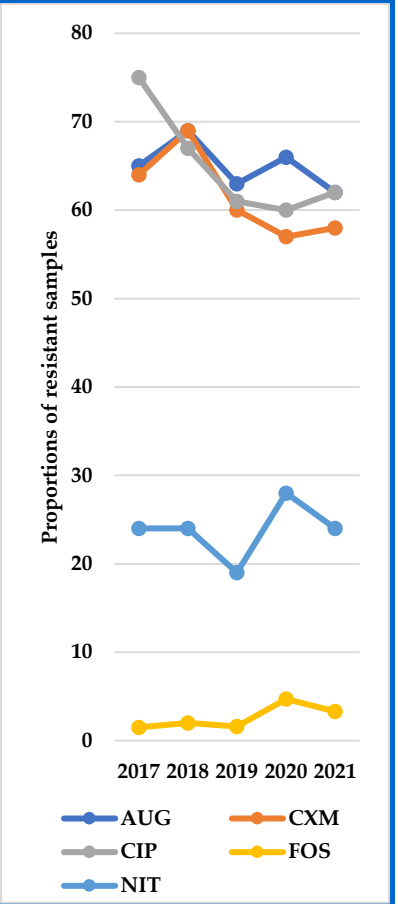

Figure shows high levels of resistance to cefuroxime, amoxiclav and ciprofloxacin and low Fosfomycin resistance among *E. coli* isolated from urine samples at MDS Lancet laboratories Ghana between 2017 to 2021

How did we measure it?

We conducted a retrospective analysis of all urine cultures obtained from the MDS Lancet Laboratories between 2017 and 2021. Proportions of uropathogens with antimicrobial resistance to oral and parenteral antimicrobials recommended by the Ghana standard treatment guidelines were determined. The proportion of MDR organisms and risk factors for the isolation of MDR organisms were also determined,

What did we find?

- Over 70% of urine cultures submitted were culture negative
- Of 20,010 positive urine cultures, *E. coli* (71%) and *Klebsiella* spp. (15%) were the commonest gram-negative organisms and *Enterococcus* spp. (1%) was the most common gram-positive organism.
- Among *E. coli,* the highest level of resistance to oral antimicrobials was to Amoxiclav (64.0%), Ciprofloxacin (62.3%) and Cefuroxime (60.2%); and the least resistance was to Fosfomycin (2%).
- *Klebsiella* spp. (69%) and *E. coli* (64%) demonstrated the highest MDR levels. Increasing age, men, residence outside Accra, and the presence of antibiotics in the urine were associated with a higher risk of having MDR bacteria

Implications

From a data perspective, The MDS-Lancet Laboratories has data accumulated over large time periods. It therefore provides an opportunity to study uropathogens and resistance patterns. This in turn can assist with validating and guiding treatment guidelines and AMR stewardship. From a results perspective, the dominant variables associated with a higher risk of MDR infections raise questions around differential treatment protocols as well as the social, environmental and biological factors that might be influencing these differences.

Recommendations

- Based on the current evidence, the recommendations of the standard treatment guidelines for the management of urinary tract infections may not be effective and may require review by the Ghana National Drugs program

- Investigating the utility of other oral antibiotics for treating UTIs by scientists may offer clinicians and patients more therapeutic options in the face of growing MDR urinary tract infections.
- Utilizing culture and susceptibility testing routinely by clinicians during the management of UTIs especially for men and elderly patients must be encouraged to avoid poor treatment outcomes because of resistant strains.
- Establishing laboratory-based surveillance of uropathogens nationwide, augmented by population-based antimicrobial resistance surveillance, will be useful to inform future policy and practices on urinary tract infections.