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Etiology and antimicrobial susceptibility patterns of bacterial agents causing urinary tract infection in children under five year, Dar es Salaam, 2010

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Abstract

Background: The global magnitude of antimicrobial resistance is unknown and more likewise in the developing countries where the literature is very scanty and in most cases deficient. The empirical therapy of urinary tract infections (UTI) relies on the predictability of the agents causing UTI and knowledge of their antimicrobial susceptibility testing patterns. Also due to rapid change in antimicrobial susceptibility pattern and development of antimicrobial resistance, this information needs to be updated regularly. This study was conducted to determine the etiology and antimicrobial resistance patterns of bacterial agents of UTI among children under-five year presenting with clinical symptoms suggestive of UTI at two Municipal hospitals in Dar es Salaam.

Methods: This was a cross-sectional study which carried out at Amana and Mwananyamala Municipal hospitals from February to April 2010. Children who presented with symptoms of UTI were enrolled in the study. Mid stream Urine sample was collected from every child who was recruited in the study. Urine samples were cultured in Cystine-Lactose-Electrolyte Deficient (CLED) agar media and susceptibility test was done in Mueller Hinton agar using Kirby Bauer technique.

A questionnaire containing socio demographic information and antimicrobial drug use behaviors was administered to the children's parents. Data was entered, cleaned and analyzed using Epi info version 3.5.1 software.

Results: A total of 270 children were recruited, the mean age was 26 months, ±15SD with a range of 12 to 60 months. Male contributed 60% (162) of the respondents while majority (39%) were, aged less than twelve months. Seventy three percent of mothers were housewives. Of the 270 cultured mid-stream urine samples, 80 (29.6%) revealed a significant single isolate growth of $\geq 10^5$ colon-forming units per milliliter of urine, 33 (12.2%) had mixed growth, 27 (10%) non-significant growth, and the remainder 130 (48.1%) revealed no bacterial growth. *Escherichia coli* was the most common isolate 34 (42.5%), followed by *Klebsiella spp* 32 (40%), *Streptococcus spp* 4 (5%) while 3 (3.8%) were isolated each for *Staphylococcus aureus*, *Proteus mirabilis* and unidentified coliforms. *Pseudomonas spp* was isolated only once. The isolated bacteria had high resistance to amoxicillin 79 (98.7%), trimethoprim-sulfamethoxazole 77 (96.2) and ampicillin 76 (95%). They had less resistance against amikacin 6 (7.5%) and nitrofurantoin 16 (20%). Self medication to children showed no significant association with the development of multiple drug resistance.

Conclusions and Recommendations: Based on the results of this study, the empirical treatment of UTI should be done mostly with nitrofurantoin which revealed lower resistance; also ciprofloxacin can be secondly considered as amikacin has limited usage to pediatrics due to side effects. In view of the high drug resistance amongst bacteria (95 – 98%), therapy should mostly be done after culture and susceptibility test has been performed. Meanwhile more studies are required to get the baseline susceptibility patterns of antibiotics to be incorporated in the National guideline for management of UTI for under-fives.