

Original Article

Rising Surge of Antimicrobial Resistance and Urinary Tract Infections in Pakistani Children: A Potential Life Threatening Scenario

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Abstract

Bacterial antimicrobial resistance (AMR) has become a leading threat to global public health. Depending upon raised global surge of AMR cases it has been speculated that by 2050, AMR associated death toll may surpass 10 million per year. One in five deaths occurred in children below five years of age, due to previously treatable infections such as vaccine preventable pneumococcal bacterial disease. In

January 2022, 1873 urine culture tests were evaluated and 34.4% tests were positive against multiple drug resistant strains. While in February 2022 1865 tests were evaluated against multiple drug resistant strains, and 31.7% positive tests were shown resistant. While in March 2022, the 28.2% tests were found resistant against multiple drugs. It has been reported from 75 different branches of Islamabad Diagnostic Center (covering whole Pakistan region) that several patients

did not respond to treatment or partially get treated after antibiotic treatment consequently remained unyielding or negative. Such untreated or partially treated patients lose the option of timely usage of specific sensitive antibiotic. This phenomenon is becoming leading cause of AMR in patients from Pakistan. It is the need of hour to leverage the estimates to course-correct action and drive innovation to stay ahead in the combat against AMR.

Keywords: Antimicrobial resistance, UTI, Pakistan

1. Introduction

Bacterial antimicrobial resistance (AMR) has become a leading threat to global public health. Depending upon raised global surge of AMR cases it has been speculated that by 2050, AMR associated death toll may surpass 10 million per year [1]. 204 countries and territories data depicted alarming impact of antibiotic resistance to the extent that AMR associated death rates even surpassed HIV/AIDS or malaria related deaths [2]. Besides AMR threats to other age groups, young children under the age of five remained particularly affected. One in five deaths occurred in children below five years of age, due to previously treatable infections such as vaccine preventable pneumococcal bacterial disease [2].

Urinary tract infection (UTI) is common infection faced in outpatient department or outpatient clinics. UTI is more common among females, children and elderly. In Pakistan it has been observed that many patients were started on antibiotics empirically, based on primary clinical symptoms. It has been reported from 75 different branches of Islamabad Diagnostic Center (IDC covering whole Pakistan) that several patients did not respond to treatment or partially get treated after antibiotic treatment consequently

remained unyielding or negative. Such untreated or partially treated patients lose the option of timely usage of specific sensitive antibiotic.

2. Material and Methods

A cross sectional study was conducted at 75 different branches of IDC. 5997 suspected UTI patients were recruited for examination of antimicrobial resistance. The study was approved by the institutional review board of IDC. Informed consent was obtained from study participants.

3. Results

In January 2022, 1873 urine culture tests were evaluated against multiple drug resistant strains and 34.4% tests were found resistant. Similarly, in February 2022 1865 tests were performed against multiple drug resistant strains and 31.7% positive tests remained resistant. However, in March 2022 2259 urine culture tests were evaluated against multiple drug resistant strains and 28.2% tests were found resistant to multiple drugs. This phenomenon is becoming leading cause of AMR in patients from Pakistan. The studies from previous decade indicated significantly higher cases (16.1%) of UTI clinical diagnosis with 30.11% cases remained resistant against *Escherichia coli*, while *Methicillin-resistant Staphylococcus aureus* among 49% of *Staphylococcus aureus* cases [3].

4. Discussion

Use of antibiotics should not be started before microbiological results and must be waited [4]. However, if deemed necessary to start antibiotic then midstream urine sample should be sent for culture beforehand, so that any change in antibiotics can be done afterwards. This study is a critical step that aids to comprehend the scale of AMR challenge. It is the

need of hour to leverage the estimates to course-correct action and drive innovation to stay ahead in the combat against AMR. Also, depending upon surge of AMR cases during crises of pandemic, there is also dire need to shift from the conventional antibiotic mode of treatment to alternative modes such as phage therapy [5].

Authors Contribution

RiU is principal investigator of the study. SRU performed the analysis and drafted manuscript. US conceived the study, critically revised the manuscript and is Co-Pi of study. US and SRU contributed equally to the study. ZZZP, AAK, and ReU assisted SRU and US for the study.

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