LETTER TO THE EDITOR

To
Editor in chief,
Journal of Dhaka medical College,
Dhaka.

About the published article "**Antimicrobial resistance pattern among diabetic patients with urinary tract infection in Bangladesh**".

Dear editor in chief,

Thank you for consistently publishing one of the most prestigious journals in Bangladesh. I have thoroughly reviewed the articles featured in the April 2022 issue and found that they were all high-quality. However, the article about the antibiotic resistance pattern in Bangladesh particularly drew my attention.

Antibiotic resistance is an emerging global threat to the healthcare systems of almost every country. It is an overlooked pandemic that demands immediate attention. According to estimates, bacterial AMR was associated with 4.95 million (3.62-6.57) deaths worldwide in 2019, including 1.27 million (95% UI 0.911-1.71) deaths caused by bacterial AMR. Escherichia coli was among the six primary pathogens responsible for fatalities associated with resistance.[1]

Understanding the burden of resistance is crucial in tackling AMR, particularly in areas with limited surveillance and sparse data. The beauty of the articles lies in the fact that the study was conducted in Feni, where facilities are limited. I appreciate the effort of the researcher and their work in studying one of the prevailing immune-suppressed conditions in Bangladesh. Diabetes increases two-fold risk of antibiotic resistant in urinary tract infection.[2] Uncontrolled diabetes increases the risk further. It would be even better if they had stratified the participants according to diabetes control status.

However, the sample size in the study was relatively small, and it did not examine whether patients received prior antibiotics before providing the urinary sample—additionally, the collection and sensitivity analysis methods needed to be elaborated upon. It is crucial to report antimicrobial agents' minimal inhibitory concentration (MIC) values in a study that discusses microbial resistance patterns. However, the original research needed to provide this information. To determine the MIC values for the antimicrobial agents used, an agar dilution technique was employed on Mueller-Hinton agar (Oxoid) by the Clinical and Laboratory Standards Institute (CLSI) recommendations.[3]

An alarming finding in this research is that some isolates are still resistant to meropenem. Additionally, over 50% of cases were resistant to two or more antibiotics, with a few being pan-resistant.

The most concerning mechanisms in E. coli are the acquisition of genes that code for extended-spectrum â-lactamases, which provide resistance to broad-spectrum cephalosporins; carbapenemases, which provide resistance to carbapenems; 16S rRNA methylases, which provide pan-resistance to aminoglycosides; plasmid-mediated quinolone resistance (PMQR) genes, which provide resistance to fluoroquinolones; and mcr genes, which provide resistance to polymyxins.[4]

The increasing concern for treating UTIs is the evolution of multidrug-resistant strains of various organisms.

Multiple factors cause the development of resistant strains. In Bangladesh, antibiotics are easily accessible as over-the-counter (OTC) drugs.[5] However, the unregulated health system, with unqualified providers prescribing antibiotics in most cases in the informal sector, complicates the situation.[6] Additionally, pharmaceutical companies' aggressive and

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unethical marketing practices exacerbate the problem.[7] The regulatory regime in Bangladesh is weak, with limited human, technical, and logistical capacity to oversee this vast market[8]. Physicians frequently prescribe higher-generation antimicrobials, such as ceftriaxone, ciprofloxacin, and azithromycin.[9-12] while qualified prescribers in secondary and tertiary-level hospitals know the treatment guidelines. However, those in the Upazilas (sub-district) hospitals are not.[13,14]

Self-treatment, which involves taking medicine without consulting a qualified provider, is prevalent, according to the studies reviewed.[15] Additionally, in 70% of cases, uncertainty about the diagnosis led to prescribing excessive amounts of antimicrobials.[16] The consumption of poultry meat and eggs with residues of antimicrobials such as tetracycline, ciprofloxacin, Moxifloxacin, and amoxicillin is also high.[17] Furthermore, hospitals in Dhaka city are contributing to the issue by discharging untreated medical waste into water bodies, resulting in high levels of resistant E. coli in the water.[18] For instance, E. coli contaminates 80% of piped water.[19]

In 2015, the World Health Organization (WHO) initiated a Global Action Plan (GAP) to address the growing threat of antimicrobial resistance (AMR) worldwide, using a 'One Health' approach that recognizes the interdependence of human health, animal health, and the environment[20]. The Global Antibiotic Resistance Partnership analyzed the situation of AMR in Bangladesh and provided recommendations to tackle the issue.[21]

To support antibiotic stewardship efforts, the WHO Expert Committee on Selection and Use of Essential Medicines developed the "AWaRe classification" in 2017. The classification categorizes antibiotics into Access, Watch, and Reserve. Antibiotics in the Access group are the essential first empirical treatment options for infectious syndromes, while those in the Watch group are the second choice.[22]

We should conduct this type of study on a large scale to aid in surveillance and monitoring.

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