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EDITORIAL

ANTIMICROBIAL RESISTANCE (AMR)



Antimicrobial Resistance (AMR) is one of the most formidable challenges to global public health today and has been recognized as a silent killer. It is estimated that around 1.27 million global deaths were due to AMR in 2019 contributing a total death of 4.95 million.

Indiscriminate use of antimicrobials in humans, animals and plants are the main drivers for emergence of antimicrobial resistance in the bacteria. In synergy with Global Action Plan (GAP-AMR) a national action plan for AMR (NAP-AMR) has been launched in 2017, the second version of NAP was published in 2022 which included the environmental dimensions for addressing complex AMR issues. The strategic objectives of NAP-AMR are aligned with the national needs and priorities.

Reports from India suggested the highest antimicrobial resistance rates are common among bacteria which cause both community and hospital acquired infections. Moreover, India was the highest consumer of antimicrobials, followed by China and the United States in 2010. The most commonly consumed antibiotics include broad spectrum penicillin, cephalosporin and fluoroquinolones. Antibiotics like Polymyxin and Carbapenems, which are usually reserved for multidrug resistant infections, have also seen a steep rise in consumption rates over time. All these enumerate the extent of antimicrobial resistant infections in India. It was found that despite a number of guidelines (NCDC, ICMR, WHO, State) are available on antimicrobial use in India, those are actually not followed rigorously.

The evolution of resistant pathogens expedited by the genetic adaptability and facilitated by global interconnectedness, has led to the emergence of “superbugs”—strains capable of resisting multiple classes of antibiotics. The effects are especially grave in low- and middle-income countries, where limited resources for diagnostic testing and infection control may hinder effective containment.

Currently, AMR surveillance in India is tertiary hospital based and focused on characterization of resistant isolates only. Most of the public information on containment of AMR, which are based on findings from tertiary care, may not be effective in controlling AMR in lower tier hospitals.

Since, 70% of Indian population reside in rural settings and receive services from primary and secondary tier hospitals, ICMR Antimicrobial Stewardship guidelines to be followed at each healthcare setting, which must have an identified stewardship team, hospital specific antimicrobial policy, guidelines for antimicrobial treatment and prophylaxis, periodical training, monitoring and reporting of antimicrobial use. The drivers of irrational antimicrobial use and AMR are not limited to healthcare providers. The community also significantly influences the prescription behaviors of the physicians. Addressing AMR requires going beyond clinical practices and understanding the socio-economic, behavioural, cultural, and educational factors of the community people at large towards antimicrobial use. Issues such as poor adherence to prescribed treatments and the over the counter purchase of medicines are major contributors to the development of AMR. One of the primary obstacles is the lack of proper knowledge about AMR and antimicrobial consumption. Many individuals have tendency to discontinue antimicrobial treatment mid-course due to financial constraints or a perceived improvement in symptoms. Easy

access to unqualified healthcare providers, and pharmacies those sell antimicrobials without prescriptions exacerbates the problem. Moreover, there is a significant lack of health education regarding AMR from healthcare providers and community influencers, which further complicates efforts to address this issue. Contribution of non-human health sector antimicrobial use such as veterinary, pharmaceutical and agricultural sectors towards developing AMR is of paramount importance and thus calls for a One Health intervention platform.

The current issue of Science and Culture on AMR not only focuses on the science behind AMR but also throws light on action points of the common people to tackle the problem. The articles published in this issue would satisfy the readers of diverse level of cultural and educational background, thus promise to improve the overall antimicrobial literacy of the population. Controlling AMR is a movement requiring participation of people from all levels with solution driven approaches for AMR challenge namely One Health dimensions of AMR, myths and facts about AMR and Antibiotic Consumption, Antimicrobial Resistance in the perspective of neonatal health etc. Other articles have thrown light on potential alternative therapies to antimicrobials such Bacteriophage therapy and Herbal formulations etc. An article on CRYSPAR CAS system enumerates on various pathways towards development of AMR. Thus compilation of diverse articles in this volume of journal would impart a comprehensive knowledge on various facets of AMR among the policy makers as well as the consumers.

Effective responses to AMR under One Health require collaborative policymaking, education, and public engagement. Data sharing, international agreements, and standardized monitoring across all relevant sectors are essential to track and curb resistance trends. Together, we can harness the strength of a unified, One Health approach to ensure that antimicrobial agents remain effective for generations to come

A multidisciplinary approach is required to tackle AMR effectively. This journal issue seeks to foster collaboration among researchers, clinicians, policymakers, and the public health community to develop and implement effective solutions. We hope this compilation not only expands understanding but also inspires actionable interventions to be undertaken against the growing threat of antimicrobial resistance.

We heartily thank the Editorial board of Science and Culture for providing us the opportunity of disseminating knowledge on emergence and transmission of AMR among the common people, who perhaps are the most vulnerable to its consequences. □

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Dr. Shanta Dutta, Director and Scientist 'G', ICMR-National Institute for Research in Bacterial Infections (ICMR-NIRBI) has made a significant contribution in enteric infectious disease and Antimicrobial Resistance (AMR) research by conducting both basic and applied studies with multifaceted outcomes impacting on improved understanding of disease epidemiology, transmission dynamics, diagnosis, prevention, control and management of enteric infections having enhanced implications on public health policies and practices. She has more than 300 publications and 3 patents to her credit. She is the Fellow of National Academy of Sciences, India (FNASc), West Bengal Academy of Science & Technology (FWAST), National Academy of Medical Science (FAMS).

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