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Impact of Covid-19 Pandemic on Antimicrobial Resistance (AMR): An opinion

Maqbool M*

Department of Pharmaceutical Sciences, University Of Kashmir, Srinagar, India

***Corresponding author:** Mudasir Maqbool, Department of Pharmaceutical Sciences, University Of Kashmir, New colony Tullamulla Ganderbal Jammu & Kashmir pincode 191131, India, Tel: 9797240145; Email: bhatmudasir.scholar@kashmiruniversity.net

Opinion

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Antimicrobial resistance (AMR) develops when bacteria, viruses, fungi, and parasites evolve over time and cease to respond to antibiotics. It makes infections more difficult to treat and raises the risk of disease transmission, severe sickness, and death. Superbugs are genetically modified microorganisms that are resistant to treatment. Antimicrobial resistance, according to the World Health Organization, is a looming pandemic and the greatest threat to global health. By 2050, it is estimated that AMR will kill 10 million people each year. High rates of resistance against antibiotics often used to treat common bacterial diseases, such as urinary tract infections, sepsis, sexually transmitted infections, and various forms of diarrhoea, have been documented worldwide, indicating that we are running out of effective antibiotics. Antibiotic-resistant Mycobacterium tuberculosis strains, meanwhile, are posing a danger to progress in curbing the global tuberculosis epidemic [1]. Antiviral medication resistance is becoming more of a problem in immunocompromised patients, because continued viral replication and protracted drug exposure result in the selection of resistant strains. Most antivirals, including antiretroviral (ARV) medications, have gained resistance. Resistance has also been observed in malarial parasites and fungi [2]. The threat of AMR has been amplified by the COVID-19 pandemic, as many patients brought to hospitals with COVID-19 are given antibiotics to prevent secondary bacterial infections [3]. A review of studies published on hospitalized COVID-19 patients identified that while 72% (1450/2010) of patients received antibiotics, only 8% (62/806) demonstrated superimposed bacterial or fungal co-infections. Azithromycin is also commonly used with hydroxychloroquine, according to the WHO, albeit it is not currently recommended outside of COVID-19 clinical trials. Antibiotic use increased as a result of the lockdown and the use of telemedicine. Increased hospital admissions also increased the chance of multidrug-resistant germs being transmitted. During the pandemic, disruptions in health services are disrupting treatments for tuberculosis and the human immunodeficiency virus, which can lead to medication resistance selection. Similarly, interruptions in immunisation services can raise the risk of illness, potentially leading to antibiotic misuse [4-6]. The widespread use of biocidal chemicals for environmental and personal disinfection, including in non-health-care settings, is another possible hazard to AMR. Low-level exposure to biocidal chemicals can favour drug-resistant strains and increase the chance of antibiotic cross-resistance, especially among Gram-negative bacteria. These biocides are expected to be found in higher amounts in wastewater treatment plants and receiving waters. This could lead to higher levels of AMR in the environment, posing a human health risk to those who are exposed. The most recent version of the interim guidelines for clinical management of the COVID-19 Pandemic incorporates antimicrobial stewardship efforts to combat AMR in the COVID-19 Pandemic. Antibiotic therapy or prevention are not recommended for individuals with mild or moderate COVID-19 until signs and symptoms of bacterial infection are present, according to the guidelines. The guidelines also suggest that older persons in long-term care facilities and children younger than five years old with moderate COVID-19 should seek empiric antibiotic bacterial pneumonia treatment. Antibiotics in the WHO's AWaRe (access, watch, reserve) categorization of antibiotics designated as access, such as co-amoxicillin, should preferable be given to these non-hospitalized individuals [6-9].

To incorporate antimicrobial stewardship into the Pandemic response, it is necessary to:

- Improve clinical competence (ability to distinguish between signs and symptoms of severe COVID-19 and those of a superimposed bacterial or fungal disease); eliminate unnecessary antibiotic use, including daily de-escalation; evaluate the need for medical devices and other items that increase the chances of health-care-associated infections; and evaluate the need for medical devices and other items that increase the chances of health-care-associated infections.
- Ensure the availability of basic health services and a consistent supply of high-quality, low-cost antimicrobials, including antiretroviral and tuberculosis medications, as well as vaccinations.
- Reduce the time it takes for COVID-19 testing to be completed by enhancing testing methodologies and extending testing facilities, particularly for suspected patients, in order to reduce the desire to start antibiotics.
- Use biocides with extreme caution for environmental and personal disinfection, and prioritize biocidal agents that do not have or have a low selection pressure for antibiotic resistance.
- Identify research gaps (e.g., rapid and affordable diagnostic tests that distinguish between bacterial and viral respiratory tract infections; the short- and long-term effects of widespread use of biocides for environmental and personal disinfection, including cross-resistance to antimicrobials; and potential alternatives for sustainable environmental and personal disinfection) to ensure that antimicrobials remain effective [6].

In addition, the following antimicrobial stewardship activities should be included: auditing the treatment plan with intervention and feedback, formulary restriction and pre-authorization, educating health care providers about antimicrobial stewardship, switching from IV to PO therapy as soon as possible to shorten the hospital stay and reduce the risk of bacterial transmission, As a result, by taking sufficient safeguards, the global threat of AMR might be averted during the COVID-19 Pandemic [10].

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