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Guest Editorial

Silent slow pandemic of antimicrobial resistance

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Antibiotics discovered in the 1920s have averted countless deaths by combating microbial pneumonia, tuberculosis, and meningitis. However, microorganisms have evolved the ability to fight back over the decades, developing resistance to the very drugs that once annihilated them—becoming so-called *"antibiotic-resistant superbugs."* The growth of antimicrobial resistance (AMR) limits our capacity to cure diseases and impedes attempts to accomplish universal health care and the health-related sustainability goal. AMR is a global concern that has to be dealt with immediately and identified as one of the ten leading public health dangers to humans globally. The frightening aspect of AMR is nefarious and quiet. According to the most recent estimates, AMR would be responsible for over 10 million deaths every year by 2050.[1]

The pandemic spurred by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) virus has placed enormous strain on public health and the world economy.[2] One of the repercussions of these misfortunes was the shortage of certain critical, life-saving medications due to the effect of interim lockdown of production facilities, export prohibitions, and hoarding by public entities. Simultaneously, the pandemic increased the requirement for analgesics, muscle relaxants, anesthetics, and even antimicrobial agents in hospitals.[3] The superfluous use of antimicrobials might very well lead to significant financial burden on healthcare organizations. This can be prompted by the drug itself and the expense of administering different antimicrobial treatments to those who have adverse outcomes as a result of the drug use, thus triggering a vicious cycle.

The substantial percentage of Coronavirus disease 2019 (COVID-19) patients admitted to the hospital wards and intensive care units (ICUs) globally, makes them particularly susceptible to secondary infections. Against a background increased risk of circulating bacterial strains and the possibility of infection via invasive procedures, deteriorating inflammatory parameters may make it more difficult for the health care professionals to distinguish COVID-19 severe inflammatory reaction from bacterial infection.[4]

The higher proportion of antimicrobial use during COVID-19 patient populations is already being blamed for the resurgence in multidrug-resistant organisms and include: Klebsiella pneumoniae producing extended-spectrum -lactamase, carbapenem-resistant Enterobacterales that produce New Delhi metallo—lactamase, Acinetobacter baumannii, and methicillin-resistant Staphylococcus aureus, Candida glabrata, pan-echinocandin resistant; and Aspergillus fumigatus which is multitriazole resistant.[5] The populations of lower- and middle-income countries are estimated to worsen disproportionately, with many already vulnerable people being pushed into impoverishment. Congested living conditions with inadequate sanitation,

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insufficient access to high-quality healthcare, and frequently irrational use of readily available over-the-counter antimicrobial agents significantly contribute to gut colonialism and the spread of antimicrobial-resistant microbes.[5] AMR is toxic to the environment, in part because patients excrete a significant portion of their drug intake into waste water, which can contaminate rivers and seas with drug residues.[4,5]

While some progress has been made, there is still a long way to keep up with newly emerging antibacterial and antifungal resistance. Possible concerns might influence antimicrobial stewardship efforts and drive antibiotic resistance during the new coronavirus disease 2019 (COVID-19) pandemic. Antibiotics are given to many people who have a mild infection without pneumonia or a moderate infection with pneumonia. Azithromycin is also commonly used with hydroxychloroquine, according to the WHO, though it is not currently indicated beyond the COVID-19 clinical studies. During the first wave, we all have seen rampant use of doxycycline, hydroxychloroquine, azithromycin, amoxicillin-clavulanic acid, ivermectin and many other drugs. There are trials available on almost every other drug in covid, including ACE inhibitors, antivirals, monoclonal antibodies, steroids, even ranitidine. Long term implications on use of doxycycline and azithromycin for treatment of their routine indications will need to be elucidated.The World Health Organization advises against using antibiotics in mild cases of covid-19, but recommends them in severe cases where there is a high risk of secondary bacterial infections and death.[6]

As part of the broader agenda, medical professionals should continue to avoid inappropriate prescription; a message that has been heeded with varying degrees of success over the last few years and merits reiteration during the current pandemic. Also as the concept of mixopathy is coming up, this message will need to be percolated more vigourously amongst new fraternity, if moves like bridge courses are implemented. To decrease the need for antibiotics, primary and secondary prevention of infection is quite important. We should have ability to recognise signs and symptoms of severe COVID-19 and those of a superimposed bacterial or fungal disease to minimise superfluous antibiotic use, including frequent de-escalation; intermittent re-evaluation of need for medical devices that raise the risk of health-care-associated infections and antibiotic use; and to enforce proper infection prevention and control measures by revising infection control committee and antibiotic policies time to time as per need. As health care respondents, there should be a coherent supply of high-quality, low-cost antimicrobials, as well as vaccinations.[7] Enhancing COVID-19 assessment tools and expanding testing capacity to reduce the need to initiate antibiotics by decreasing turnaround time, particularly critical for suspected patients. Notably, we should priotise public health interventions by providing access to safe drinking water, adequate sanitation, and high-quality healthcare. Raising awareness about antimicrobial resistance (AMR) challenges, implementing policy incentives, and enforcing appropriate regulations, all contribute to the fight against resistance.[7]

Before the start of SARS-CoV-2 pandemic itself, annihilating AMR required immediate robust solutions. And now when we are in the throes of a pandemic, it is essential to understand the pathogenesis of SARS-CoV-2 infection and the possibility of bacterial co-infections. This issue is magnified in developing nations, where statistics on resistance patterns are hard to obtain, contagious microbe transmitting situations are desirable, and management resources are inadequate. Antimicrobial stewardship actions are guided by the principles of proper prescriptions and optimal use of antimicrobial drugs, quality diagnosis and treatment, and pathogen control and mitigation, and these initiatives must be strengthened, even more so in developing nations. Conserving antimicrobial efficacy as a global resource will require the participation of the entire society. Effective and context-specific educational programs are required to effect transformation.

1. Conflict of Interest

None.

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