

# Indiscriminate Use of Antibiotics for COVID-19 Treatment in South Asian Countries is a Threat for Future Pandemics Due to Antibiotic Resistance

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Sohel Daria  and Md. Rabiul Islam 

Department of Pharmacy, University of Asia Pacific, Farmgate, Dhaka, Bangladesh.

**ABSTRACT:** The COVID-19 pandemic has put enormous strain on the global public health and healthcare systems. Here we aimed to assess the prevalence and impact of indiscriminate use of antibiotics for COVID-19 treatment in south Asian countries. We observed the indiscriminate use of antibiotics in south Asian countries and other similar parts of the world. Along with vaccines, people in poor and developing countries have been taking antibiotics and some other medications without proper jurisdiction during the waves of the COVID-19 pandemic. We all know that COVID-19 is a viral disease, and only a few patients might have bacterial co-infections. Therefore, the role of antibiotics is ambiguous in most COVID-19 cases. Consequently, the overuse of antibiotics would cause antimicrobial resistance that has the potential to become a 2-edged sword after the COVID-19 pandemic era. Our findings emphasize the judicious use of antibiotics in COVID-19 therapy, especially in poor and developing countries across the globe.

**KEYWORDS:** COVID-19 pandemic, COVID-19 treatment, antibiotics, antimicrobial resistance, antibiotic misuse, south Asian countries

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**CORRESPONDING AUTHOR:** Md. Rabiul Islam, Department of Pharmacy, University of Asia Pacific, 74/A Green Road, Farmgate, Dhaka 1205, Bangladesh. Email: robi.ayaan@gmail.com

The COVID-19 pandemic caused by novel coronavirus strain SARS-CoV-2 reveals various loopholes and fragility of the healthcare systems worldwide.<sup>1</sup> This ongoing pandemic badly impacted every aspect of public health and healthcare systems in any country.<sup>2–6</sup> The impact of this pandemic in south Asian countries is high where healthcare systems are more fragile.<sup>7–9</sup> Most COVID-19 patients develop mild/moderate symptoms (eg, fever, cough, tiredness, loss of taste and smell, difficulty breathing, or shortness of breath) that resemble a bacterial infection. Only 6% of the infected patients became critically ill and required ICU support. Moreover, only 20% of the intensive care unit (ICU) patients had a severe infection.<sup>10</sup> Physicians frequently prescribe different antimicrobials for COVID-19 patients due to the scarcity of an antiviral treatment approach and vaccine against COVID-19. Also, it is tough to differentiate between COVID-19 and bacterial pneumonia at the very early stage by examining the symptoms.<sup>11,12</sup> Study shows that 72% of COVID-19 patients got different types of antibiotics for their COVID treatment. However, only 1% to 16% of bacterial co-infection occurred who received antibiotics.<sup>13</sup> Studies found that in south Asia, about 70% of hospitalized patients have been administered a minimum of one or more antibiotics, whereas 100% of ICU patients received antibiotics.<sup>11,12</sup> Besides broad-spectrum antibiotics, many physicians indiscriminately prescribe antiviral, antimalarial, and antiparasitic drugs for COVID-19 patients. In Bangladeshi hospitals, the highest prescribed antibiotics were third-generation cephalosporins (60%) followed by macrolide (40%). Many patients who took antibiotics for COVID-19 treatment with earlier symptoms were found COVID-19 negative after the confirmatory test.<sup>13</sup> An interrupted time series analysis revealed a significant increase in

non-CAF antibiotic sales during the first wave of the COVID-19 pandemic.<sup>14</sup> A study conducted in Pakistan found that 88.1% of patients received multiple antibiotics without any culture and sensitivity tests. Azithromycin was the most frequently prescribed antibiotic to treat COVID-19 patients.<sup>15</sup> A study reported that antibiotic sales significantly increased during the first wave of COVID-19 epidemic in India.<sup>14</sup>

Frequent prescribing of antibiotics, availability of over-the-counter antibiotics through unregulated/unauthorized medicine shops (pharmacies), and uncontrolled use of antibiotics contribute to the current challenge of antimicrobial resistance (AMR). The situation has worsened due to the COVID-19 pandemic that will complicate the healthcare systems and health outcomes.<sup>16</sup> Experts are worried about the increasing AMR among people in Bangladesh and India. The hospitals have become the hub for AMR in these countries. The expert assumed that the indiscriminate use of antibiotics during the peak of the COVID-19 pandemic might reduce the effectiveness of some antibiotics.<sup>17</sup> A study in a Bangladeshi COVID-19 dedicated hospital found that almost 80% of antibiotics for COVID-19 treatment were unnecessary, and about 70% of the prescribed medicines were antibiotics.<sup>18</sup> Indiscriminate antibiotic use for treating COVID-19 patients will potentially develop AMR that might be the next global health pandemic.<sup>19</sup>

However, the COVID-19 mortality due to bacterial superinfection is more common than any other respiratory viral diseases.<sup>20</sup> Moreover, bacterial superinfection among hospitalized COVID-19 patients accelerates the disease progression and severity. The majority of COVID-19 patients are dying due to bacterial superinfection.<sup>21</sup> This condition urges antibiotic



therapy and ICU support for COVID-19 patients.<sup>22</sup> In that case, COVID-19 patients require antibiotics for proper management. But, there should have a balance between effective treatment and antimicrobial resistance. Therefore, physicians should follow antibiotic treatment protocols and guidelines extrapolated from international recommendations to manage bacterial superinfection in COVID-19 patients. Indiscriminate use of antibiotics without proper jurisdiction might create a future threat for another pandemic due to antibiotic resistance.

According to WHO, antibiotics become less effective against different strains of bacteria. As a result, many infections (eg, pneumonia, tuberculosis, and salmonellosis) are becoming difficult to treat. It warned that without prompt action to control the AMR, the world might face a “post-antibiotic” era where minor injuries and common infections might be lethal.<sup>23</sup> The major reasons for AMR across South and East Asia are the widespread accessibility of OTC antibiotics, lack of access to safe-pure drinking water, and inadequate sanitation fuel the spread of antibiotic-resistant “superbugs.”<sup>24</sup> The people of South Asia usually take antibiotics to treat common colds which are viral infection, and mild diarrheal illness that fuels the spreading of AMR in the community.<sup>25</sup> As people are used to taking antibiotics in treating common colds, and the symptoms of COVID-19 resemble colds/flu, it exacerbates the overuse of antibiotics. Non-qualified healthcare workers and professional physicians in the informal healthcare sectors are prescribing antibiotics without proper jurisdiction.<sup>25</sup> Moreover, this phenomenon has increased significantly during the ongoing pandemic. Sometimes the over-prescription of antibiotics in developing countries is linked with aggressive and unethical marketing practices of the pharmaceutical companies.<sup>26</sup> Such irrational use of antibiotics is putting a superfluous financial burden on patients of these countries.

After the detection of highly muted variant omicron, the daily caseloads of novel coronavirus are increasing alarmingly in south Asian countries.<sup>27</sup> Several countries imposed different restrictions on regular activities to curb the transmission of this deadly variant.<sup>28-33</sup> The impact of COVID-19 pandemic and its responses is tremendous on human life across the world.<sup>8,34-45</sup> Therefore, along with COVID-19 vaccines, people in poor and developing countries might consume a myriad of antibiotics and other drugs without prescription during the COVID-19 waves.<sup>46-55</sup> The lessons learned from the previous pandemic should be implemented to regulate the usage of antibiotics in these countries. The pandemic phase of COVID-19 might be ended after the Omicron wave; however, the COVID-19 will continue.<sup>56</sup> Drug and healthcare regulatory authorities in several south Asian countries are trying to impose a control system regarding the indiscriminate use of antimicrobials and prevent AMR. However, we find their inadequate efforts in some countries due to the lack of proper guidelines, laws, logistics, and resources. South Asian countries require strong legislation and public awareness to address the threat due to AMR. In this


regard, the healthcare authorities of south Asian countries can develop and implement country-specific antibiotic stewardship programs to assess and improve how antibiotics are prescribed by physicians and used by patients. The healthcare regulatory authorities should be more cautious in controlling the overuse of antibiotics in COVID-19 to prevent antibiotic resistance. The drug regulatory authorities should be more vigilant in implementing the antibiotic dispensing guidelines for outpatients. Also, they should take zero tolerance for antibiotic dispensing without prescription by the retailers. The healthcare authorities should monitor for rational use of antibiotics in hospitalized COVID-19 patients. Moreover, graduate pharmacists must be involved in the mainstream of the healthcare system to dispense antibiotics in a more controlled way. An electronic prescription tracking system can be adapted to dispense antibiotics to control the indiscriminate use of antibiotics. There should have a single computer database in which all the antibiotics that are dispensed are conveyed. Also, the authorities can set a maximum annual intake limit for antimicrobials. They should promote the prudent use of antibiotics in both hospitalized and non-hospitalized patients. We hope that the policymakers will recognize the seriousness of this issue and act promptly to reduce the irrational use of antibiotics during the devastating wave of the COVID-19 pandemic.

### Author Contributions

SD devised the study and wrote the first draft. MRI edited and revised the manuscript. Both the authors reviewed and approved the final submission.

### ORCID iDs

Sohel Daria  <https://orcid.org/0000-0001-7952-8147>

Md. Rabiul Islam  <https://orcid.org/0000-0003-2820-3144>

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