

COMMENTARY

# Coronavirus (COVID-19) Pandemic: Concern about Misuse of Antibiotics

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**Abstract:** Novel coronavirus, a severe acute respiratory syndrome coronavirus 2 (SARSCoV-2) causes COVID-19, which has been a global threat for human health. The infection of coronavirus spread worldwide. Particularly, the rapid spread in the South American and Asian countries is concerning where population density is very high, and health facilities are inadequate compared to developed countries. In developing countries, people are less willing to go to physicians or hospitals to diagnose diseases. Self-medication is a widespread and prominent practice in those countries, particularly taking of antibiotics. Hence, antibiotics, particularly azithromycin and other last-resort antibiotics related to respiratory tract infection, might be misused or overused for COVID-19 treatment. Therefore, we recommend to the responsible authorities to take an urgent initiative to concern the people of developing and least developed countries about the misuse or overuse of antibiotics against the coronavirus.

**Keywords:** Coronavirus, Self-medication, Azithromycin, Misuse of antibiotics, Antibiotic resistance

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Novel coronavirus, a severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) originated from Wuhan, China, which has been a global threat for human health (WHO, 2020). High fever, dry cough, and breathing difficulties associated with respiratory complications are the main dreadful symptoms of SARS-CoV-2 infection. Lack of prophylactic vaccines and therapeutic protocols, high risk of hospitalization and death; all of these constitute severe challenges in patient management. SARS-CoV-2 virus transmits from human to human through micro-droplets arising from sneezing, coughing, or even talking loudly (Xu

*et al.*, 2020). A recent study found that the coronavirus remained viable and infectious from hours to few days depending on the surfaces and virus titer (van Doremalen *et al.*, 2020). No vaccines have been developed yet. However, scientists are trying to develop one. In the absence of vaccines, the number of deaths is increasing gradually. The total number of deaths surpasses 271,719 in the world as of May 08, 2020 (Worldometers, 2020).

Despite lack of proven treatment methods, a small number of drugs are being tested globally. Hydroxychloroquine and azithromycin are being used for emergency treatment of COVID-19 patients in USA (NIH, 2020). Besides, The New York Times recently reported that doctors are desperately using broad-spectrum antibiotics against the COVID-19 infected hospitalized patients because they feared the patients could be vulnerable to life-threatening secondary bacterial infections. Moreover, Dr. Teena Chopra, the hospital's director of epidemiology and antibiotic stewardship, stated that more than 80 percent of hospitals arriving patients were given antimicrobial drugs. She quoted, "at one point, we were afraid we would run out" and "many physicians were inappropriately giving antibiotics because, honestly, they had limited choices". Doctors across the USA are taking lessons from their overuse of antibiotics that could speed up the resistance to the lifesaving drugs as bacteria mutate (The New York Times, 2020). The pandemic not only provides lessons about the judicious use of antibiotics, but it also highlights another global health threat that has been mounting the threat of antimicrobial resistance (The New York Times, 2020). The United Nations reported that drug-resistant diseases cause at least 700,000 deaths that might be increased to 10 million deaths globally per year by 2050 if no action is immediately taken (UN, 2019).

In Japan, favipiravir (brand name avigan) and remdesivir were permitted to be used against COVID-19 (The Japan Times, 2020). The drug, remdesivir, is also permitted to be used in UK and Scotland against the virus as a trial basis (Glasgow Times, 2020). Recently, the US FDA allowed using remdesivir against COVID-19 treatment (FDA, 2020). In China, chloroquine phosphate is recommended to be used regarding the prevention and treatment of COVID-19 pneumonia (Gao *et al.*, 2020). Another drug, azithromycin, is an antibiotic used against bacterial infection, however this antibiotic was previously used for the treatment of Zika virus (Li *et al.*, 2019). A French study suggesting hydroxychloroquine's effectiveness in reducing viral load in patients with COVID-19, has caught considerable attention worldwide. The study also indicated that the addition of azithromycin could reinforce the effect of hydroxychloroquine. This finding led to the emergency authorization of hydroxychloroquine with or without azithromycin in hospitalized patients with COVID-19 (Gautret *et al.*, 2020). In Bangladesh, the drugs e.g., chloroquine, hydroxychloroquine, and azithromycin have been recommended in the treatment protocol of COVID-19 patients according to the "National Guidelines on Clinical Management of Coronavirus Disease-2019" (The Business Standard, 2020). Currently, azithromycin and hydroxychloroquine are being used to treat COVID-19 positive patients in Bangladesh. Besides, an antiprotozoal drug called ivermectin and an antibiotic doxycycline (a type of tetracycline) are currently being used for the treatment of COVID-19 infected patients in Bangladesh, even in India, ivermectin is being used in treatment of coronavirus patients (Zeenews, 2020).

Recently, the number of infections and deaths is rapidly increasing in South Asia and South-East Asia, particularly in Bangladesh, India, Pakistan, Indonesia. To the best of our knowledge, in developing and least developed countries like Bangladesh, where sanitation, personal hygiene, and social distancing are not adequate to prevent the outbreak of the virus. Moreover, people are generally not concerned about viral or other contagious dis-

eases. Also, several myths and fake news circulate in social and news media, affecting people's perceptions. Consequently, mass panic has triggered panic-buying, mistrust in the community, and unnecessary hospital visits (Hossain *et al.*, 2020).

In Bangladesh, people are usually infected by the seasonal flu, with the change of season where pneumonia, coughing, fever, and headaches are common occurrences, especially in children and elderly people. Self-medication is very common and prominent in developing countries, particularly taking antibiotics against cough, fever, food poisoning, ear and throat pain due to poor regulatory controls and ease due to being available (Biswas *et al.*, 2014). Their study found about 27% of the 1330 participants experienced self-medication with antibiotics, whereas azithromycin was about 21% and others were higher than azithromycin in Bangladesh. A recent study found that multi-drug resistance (MDR) have rapidly increased in Bangladesh and grew nearly two-fold in 2019 compared to 2015 (Safain *et al.*, 2020). They found alarming results that among 430 isolates, 53% came out as MDR with 96.6% of *Escherichia coli* and 90% of *Staphylococcus aureus*. These findings show the extent of overuse of antibiotics and emphasized the need for urgent steps to halt the increasing antibiotic resistance in hospital settings (Safain *et al.*, 2020).

Southeast Asia is considered to have the highest risk of antimicrobial resistance among all the WHO categorized regions (Hoque *et al.*, 2020). Often, antibiotics can be purchased from the pharmacy without a prescription. In addition, antibiotics are often over-prescribed and over-used. Concerned people are making stocks of azithromycin and sometimes hydroxychloroquine, ivermectin and doxycycline at their home as precautionary measures in the COVID-19 pandemic situation in Bangladesh (personal communication with drug traders). In addition, some antibiotics are being used against the respiratory organ infection and are also stored by general people at their homes. Thus, our concern about the misuse of azithromycin and other antibiotics particularly the last-resort antibiotics (aminoglycosides, amphotericin B, carbapenems, cefiderocol, colistin, linezolid, tigecycline, vancomycin etc.) in Bangladesh and other developing countries at this COVID-19 pandemic time. Subsequently, the misuse or overuse of antibiotics may enhance and spread of antibiotic resistances in those countries.

Therefore, stringent policies and regulations are very essential for the rational use of antibiotics to contain the spread of antibiotic resistances. Implementing existing policies and strategies remains a challenge due to poor awareness, inadequate resources, and the absence of national surveillance (Hoque *et al.*, 2020). Thus, we recommend that national and international organizations to take immediate initiative to - (i) improve awareness about the appropriate and rational use of antibiotics and prevent the misuse of antibiotics; (ii) regulate the appropriate disposal of expired/unused antibiotics; (iii) strengthen the surveillance and research; (iv) strengthen policies, programs and to ensure a robust national action plan to tackle antibiotic resistance; and finally (v) make information available on the impact of antibiotics and antibiotic resistance in developing and least developed countries particularly in Bangladesh.

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