



OPEN ACCESS



ANTIBIOTICS OVERUSE/ MISUSE IN COVID-19 AND HOW TO MITIGATE?

Khalid Mahmood✉

Department of Medicine,
Lady Reading Hospital Pe-
shawar - Pakistan

Address for correspondence:
Khalid Mahmood
Department of Medicine,
Lady Reading Hospital Pe-
shawar - Pakistan

E-mail:
khalidm30@hotmail.com

Antibacterial drugs, also referred to as antibiotics, prevent the growth and development of bacteria. They are used to treat illnesses caused by pathogenic bacteria and include a variety of potent medications. For viral infections including common cold and flu, antibiotics are not recommended. Corona Virus Disease (COVID-19) is also an infection caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and antibiotics are mostly not required for its management. However, it is possible that secondary bacterial infections occur in some patients with COVID-19 leading to increased disease severity and possibly adverse outcome, for which antibiotics are recommended. These superimposed bacterial infections in COVID-19 are reportedly more common (14% to 28%) in hospitalised patients with severe disease and in intensive care unit (ICU) settings.^{1,2}

Antibiotics are not indicated in most cases of COVID-19 but too many of these patients get unneeded antibiotics on an empirical basis. Most, if not all, of the patients hospitalized with suspected or confirmed COVID-19 in major hospitals of Khyber Pakhtunkhwa, Pakistan have received antibiotics. In fact, the majority of these patients were on double and sometimes triple antibiotics combination. Besides Azithromycin other broad-spectrum antibiotics like Meropenem, Sulbactam-Cefoperazone and Tazobactam-Piperacillin have been commonly prescribed in our hospitals. Azithromycin in combination with Hydroxychloroquine was initially thought to be having some antiviral effect against SARS-CoV-2 and was used by our COVID-19 patients either themselves or on doctor's advice. Its efficacy, however, against COVID-19 was never established, and opposing conclusions were drawn in different studies.^{3,4} Furthermore the investigators of the RECOVERY trial found no additional benefit of Azithromycin when added to the standard care regimen.⁵

This overuse of antibiotics in COVID-19 is not limited to our setup. Data suggest that 50-75% of COVID-19 patients received antibiotics at some stage

in developed countries as well. In Michigan state of United States, over half of the hospitalized patients with COVID-19 during the peak months received antibiotics. Only 3.5% of the patients in their cohort had a super-vening bacterial infection. This amounts to putting 20 extra patients on antibiotics unnecessarily in the hope of treating one patient having both bacterial and viral infections.⁶

In general, Antibiotics put patients at the risk of opportunistic infections like Clostridium Difficile which can worsen their chances of recovery. It also exposes the users to many other adverse effects associated with their use. Besides, it adds to the ongoing pandemic of antibiotic resistance and the development of superbugs.⁷ Antibiotics resistance develops when these drugs are inappropriately prescribed and the bacteria develop a mechanism to evade these drugs. Health-care facilities are the main source of the emergence of antibiotic resistance. Furthermore, by inappropriately using Azithromycin in COVID-19 patients, it might lose its efficacy against XDR Salmonella which is rapidly spreading across Pakistan.⁸

At times it is difficult to differentiate between viral and bacterial pneumonia but when RT-PCR for COVID-19 result is positive one should start thinking about stopping the antibiotics unless there is a super-vening bacterial infection. It is recommended that patients should not be put on antibiotics for mild COVID-19. In moderate to severe disease, antibiotics should only be prescribed when there is evidence of superimposed bacterial infection as shown by raised White cell count, positive reports of culture, or raised Procalcitonin level. Remember low Procalcitonin is a sensitive marker of ruling out concomitant bacterial infection. In ICU admitted patients, PCT levels of > 1.00 µg/L rule in, whereas concentrations of < 0.25 µg/L rule out secondary bacterial infections with good predictive values.⁹ CRP is an acute-phase reactant that rises in moderate to severe cases but more so in bacterial superinfection and may help in deciding the use of antibiotics in the later stage

This article may be cited as

Mahmood K. Antibiotics Overuse/ Misuse in COVID-19 and How to Mitigate?. J Postgrad Med Inst. 2022; 36(2): 61-2. <https://doi.org/10.54079/jpmi.36.2.3122>

of COVID-19.¹⁰ By all means, the duration of antibiotic treatment should not exceed 7 days in general and evidence suggests that shorter durations can reduce the adverse effects of antimicrobials.¹¹

In summary, antibiotics should not be prescribed to prevent or treat COVID-19. However, if a patient is hospitalised with COVID-19, he/ she may need antibiotics as bacterial co-infection/superinfection is possible. The latter may be diagnosed in the appropriate clinical context and after doing relevant investigations.

In Pakistan, a relatively high rate of antibiotic prescribing is experienced and by prescribing short-course therapy, the burden of inappropriate antimicrobial use can be reduced. This will require a collective effort on the part of the healthcare providers, the various Medical Teaching Institutions, and the government to discourage this practice of inappropriate and overuse of antibiotics in COVID-19 patients. Furthermore, patients need to be educated and informed that not all fevers need treatment with antibiotics.

■ REFERENCES

1. Langford BJ, So M, Raybardhan S et al. (2020) Bacterial co-infection and secondary infection in patients with COVID-19: a living rapid review and meta-analysis. *Clin Microbiol Infect.* 26(12):1622-29. DOI:10.1016/j.cmi.2020.07.016.
2. Feng Y, Ling Y, Bai T, Xie Y, Huang J, Li J, et al. COVID-19 with different severities: a multi-center study of clinical features. *Am J Respir Crit Care Med.* 2020;201(11):1380-88. DOI:10.1164/rccm.202002-04450C.
3. Gautret P, Lagier JC, Parola P, Hoang VT, Meddeb L, Mailhe M, et al. Hydroxychloroquine and azithromycin as a treatment of COVID-19: results of an open-label non-randomized clinical trial. *Int J Antimicrob Agents.* 2020;56(1):105949. DOI:10.1016/j.ijantimicag.2020.105949.
4. Molina JM, Delaugerre C, Le Goff J, Mela-Lima B, Ponscarne D, Goldwirt L, et al. No evidence of rapid antiviral clearance or clinical benefit with the combination of hydroxychloroquine and azithromycin in patients with severe COVID-19 infection. *Med Mal Infect.* 2020;50(4):384. DOI:10.1016/j.medmal.2020.03.006
5. Berwingar O. Azithromycin, RECOVERY, and the power of large, simple trials. A randomised, controlled, open-label, platform trial. *Lancet.* 2021;397(10274):559-60.
6. Vaughn VM, Gandhi T, Petty LA, Patel PK, Prescott HC, Malani AN, Ratz D, McLaughlin E, Chopra V. A Flanders, S. Empiric Antibacterial Therapy and Community-Onset Bacterial Co-Infection In Patients Hospitalized with COVID-19: A Multi-Hospital Cohort Study. *Clin Infect Dis.* 2020;72(10):533-41 DOI:10.1093/cid/ciaa1239.
7. Mahmood K. Antibiotic Resistance-A disaster in Making. Editorial. *Khyber J Med Sci.* 2015;8(3):317-18.
8. Monthly update on XDR-Typhoid surveillance Pakistan-WHO-January 2021.
9. Van BM, Kox M, Frenzel T, Pickkers P, Schouten J. Biomarkers for antimicrobial stewardship: a reappraisal in COVID-19 times? *Crit Care.* 2020;24(1):600. DOI:10.1186/s13054-020-03291-w.
10. Potempa LA, Rajab IM, Hart PC, Bordon J, Fernandez-Botran R. Insights into the Use of C-Reactive Protein as a Diagnostic Index of Disease Severity in COVID-19 Infections. *Am J Trop Med Hyg.* 2020;103(2):561-63. DOI:10.4269/ajtmh.20-0473.
11. Wilson HL, Daveson K, Del Mar CB. Optimal antimicrobial duration for common bacterial infections. *Aust Prescr.* 2019;42(1):5-9. DOI:10.18773/aust-prescr.2019.001.