

Controversial Use of Antibiotics in Patient with Sars-Cov-2

Carlos Mauricio Vergara Lobo¹, Rafael Chica Polo², Dayana Judith De La Rosa González³, Cristina Isabel Balmaceda Herrera⁴, Carlos Andrés Pérez Lozano⁵, Carlos Mauricio Castro González⁶, Wanda Elena Jiménez Cordero⁷, Jamer Luis Benítez Ávila⁸

¹Pediatrician Specialized in Pediatric Infectology, Universidad de Buenos Aires, Argentina

²Pediatrician Specialist in Neonatology, Universidad de Buenos Aires, Argentina

³Epidemiologist Physician, Universidad Autónoma de Bucaramanga, Colombia

⁴General Physician, Universidad Libre de Barranquilla, Colombia

⁵General Physician, Fundación Universitaria de Ciencias de la Salud, Bogotá -Colombia

⁶General Physician, Universidad Libre de Barranquilla, Colombia

⁷General Physician, Universidad del Sinú, Montería

⁸General Physician, corporación universitaria Rafael Núñez, Cartagena

ABSTRACT

Background: The SARS-CoV-2 coronavirus is a new type of coronavirus that can affect people and the disease it causes is called COVID-19. Coronaviruses are enveloped RNA viruses that cause respiratory illnesses of varying severity, from the common cold to deadly pneumonia. The WHO first learned of the existence of this new virus on December 31, 2019, when it was informed of a group of cases of "viral pneumonia" that had been declared in Wuhan.

Methodology: A narrative review was carried out through various databases from January 2020 to June 2021; the search and selection of articles was carried out in journals indexed in English. The following keywords were used: Coronavirus, Sars-Cov 2, Covid 19, ARDS in Covid 19, Antibiotics Associated with Sars-Cov 2

Results: There are no controlled clinical trials evaluating the use of empirical antimicrobials in patients with COVID-19 or other coronaviruses. Therefore, the recommendations are based on extrapolation of data from other viral pneumonias that may suffer from bacterial superinfection, particularly viral pneumonias due to influenza.

Conclusions: The present review seeks to clarify the functional role that antimicrobials have with respect to infection by sars-cov 2 (COVID-19), in which circumstances they are necessary to use them and which do not merit it.

KEYWORDS: Coronavirus, Sars-Cov 2, Covid 19, ARDS, Antibiotics.

ARTICLE DETAILS

Published On:
08 September 2021

Available on:
<https://ijpbms.com/>

INTRODUCTION

Numerous coronaviruses, discovered in domestic poultry in the 1930s, cause respiratory, gastrointestinal, liver and neurological diseases in animals. Only 7 coronaviruses are known to cause disease in humans (1).

Most of the time, 4 out of 7 coronaviruses cause symptoms of the common cold. Coronaviruses 229E, OC43, NL63, and HKU1 cause about 15-30% of common cold cases. Serious lower respiratory infections, including bronchiolitis and

pneumonia, can occur very rarely, especially in infants, the elderly, and immunocompromised people (2).

Three of the 7 coronaviruses cause much more severe and sometimes fatal respiratory infections in humans than the other coronaviruses and have caused major outbreaks of deadly pneumonia in the 21st century:

SARS-CoV-2 is a new coronavirus identified as the cause of the 2019 coronavirus disease (COVID-19) that began in

Controversial Use of Antibiotics in Patient with Sars-Cov-2

Wuhan, China, in late 2019 and has spread around the world (3).

MERS-CoV was identified in 2012 as the cause of Middle East respiratory syndrome (MERS) (3).

SARS-CoV was identified in 2002 as the cause of an outbreak of severe acute respiratory syndrome (SARS) that began in China in late 2002 (4).

The Spanish Agency for Medicines and Health Products (Aemps) has issued a note in which it warns of the challenges posed by the Covid-19 pandemic for the effective use of antibiotics and the management of bacterial infections. And, they warn, "the excessive or inappropriate prescription of antibiotic treatments in the context of the pandemic could facilitate the development of resistant bacteria and reduce the effectiveness of future treatments." For this reason, they call for "extreme caution in the use of this type of medicine" (5).

Recent studies show that more than 70-80% of patients diagnosed with SARS-COV-2 received antibiotic treatment. This rapid increase in the use of antibiotic therapy can cause a significant increase in the selection of resistant bacterial pathogens, together with the appearance of other associated infections such as *C. difficile*, with an acceleration in the post-pandemic (6).

It is estimated that more than 10 million people could die from infections by resistant bacteria by 2050, this period being shortened due to the devastating impact of overuse during the pandemic, it is imperative to standardize and select patients who will require treatment antibiotic during SARS-COV-2 infection (7).

There is no clear evidence regarding the best treatment options in infections associated with COVID-19 and the proposed list is based on guidelines and recommendations in situations of this type of infection (such as ventilator-associated lung disease, sepsis, etc.) in other conditions (8).

In a critically ill patient due to COVID-19, secondary bacterial pulmonary infection is frequent (both due to the damage caused by the virus and due to infection associated with mechanical ventilation). The symptoms of secondary bacterial infection in patients with COVID-19 can be similar to those of the underlying viral infection, making it difficult to diagnose. This can be seen indirectly reflected in the high rates of intravenous antibiotics administered in Wuhan: 53% with non-severe disease and > 90% of patients hospitalized or in the ICU (9).

At present we are in a pandemic due to covid 19, it was declared a public health disease by the WHO on March 11, 2020 to date there are no clinical trials that support the specific treatment of this pathology, therefore this review has as objective to clarify when the use of antibiotics is indicated in patients carrying the sars-cov 2 virus (COVID 19) (10).

MATERIALS AND METHODS

A narrative review was carried out, in which the PubMed, Scielo and ScienceDirect databases, among others, were searched. The collection and selection of articles was carried

out in journals indexed in English from 2020 to 2021. As keywords, the following terms were used in the databases according to the DeCS and MeSH methodology: Coronavirus, Sars-Cov 2, Covid 19, ARDS in Covid 19, Antibiotics Associated with Sars-Cov 2. In this review, 50 original and review publications related to the subject studied were identified, of which 20 articles met the specified inclusion requirements, such as, articles that were in a range not less than the year 2020, that were full-text articles and that reported on the use of antibiotics in patients infected with sars-cov 2. As exclusion criteria, it was taken into account that the articles did not have information sufficient and that they did not submit the full text at the time of its review.

RESULTS

USE OF ANTIBIOTICS IN PATIENTS WITH SARS-VOC 2 AND ASSOCIATED BACTERIAL INFECTION

The COVID-19 pandemic constitutes an unprecedented challenge in all aspects of healthcare, including the effective use of antibiotics and the management of bacterial infections. Excessive or inappropriate prescription of antibiotic treatments in the context of the pandemic could facilitate the development of resistant bacteria and reduce the effectiveness of future treatments, so caution should be exercised in the use of this type of medication. Although COVID-19 is a viral infection and, therefore, it is not treated or prevented with antibiotics, there are diagnosed patients in whom there is confirmation or high suspicion of bacterial coinfection or superinfection. In these clinical conditions, it is inevitable to consider the prescription of antibiotic treatment. In a review study on bacterial or fungal coinfections in patients with COVID-19, it was found that 62/806 (8%) of patients presented some type of coinfection during admission. In addition, in a secondary analysis, they showed that 1450/2010 (72%) of patients received antibiotic therapy, at the intrahospital level, it is necessary to correctly use the diagnostic tests and document the possible bacterial coinfections, being necessary to perform the corresponding microbiological tests prior to initiation. From the empirical antibiotic, it can be difficult to differentiate COVID-19 pneumonia from bacterial pneumonia, due to overlapping clinical features, particularly cough, fever, hypoxia, and changes in chest radiographs (11,12). As in bacterial pneumonia, the blood concentration of C-reactive protein (CRP) generally increases in COVID-19 and generally increases significantly with severity, reflecting a virus-mediated inflammatory response to the use of antibiotics in patients with covid 19 and with bacterial infection and superinfection, the list of proposed antimicrobials is a reference and must comply with the guidelines and sensitivity of local pathogens to treatments (13).

DISCUSSION

Infections by covid 19 have been constant in the timeline since the presentation of the first cases, today being a

Controversial Use of Antibiotics in Patient with Sars-Cov-2

pandemic that has affected the general population, the most affected being those with some degree of vulnerability such as elderly patients. with multiple comorbidities, respiratory diseases among others, with the same increase in this at the extra and intrahospital level, the use of antibiotics has been increasing, contributing to a worse prognosis of the patient against covid 19 in addition to increasing bacterial resistance in the future, so The use of this type of drugs is being extrapolated without even having a study or clinical trial that supports the use of them in sars-cov2 infection without co-infection (14).

This issue should be addressed by clinical trials that support the appropriate pharmacological use against sars-cov2 infection without co-infection, thus establishing effective drug pillars, which would lead us to stop extrapolating antibiotics in this type of infections and thus decrease mortality from covid 19 in the near future and bacterial resistance in the future.

CONCLUSIONS

The use of antibiotics in times of covid has been overestimated, thus generating great consequences for the future, so it should be clarified that this type of medication is not indicated in every patient carrying the virus, certain clinical criteria must be met, diagnoses for the correct therapeutic drug exercise

REFERENCES

- I. Wei, W., Ortwine, J. K., Mang, N. S., Joseph, C., Hall, B. C., & Prokesch, B. C. (2020). Limited role for antibiotics in COVID-19: scarce evidence of bacterial coinfection. Available at SSRN 3622388.
- II. Lucien, M. A. B., Canarie, M. F., Kilgore, P. E., Jean-Denis, G., Fénélon, N., Pierre, M., & Ramon-Pardo, P. (2021). Antibiotics and antimicrobial resistance in the COVID-19 era: Perspective from resource-limited settings. *International Journal of Infectious Diseases*, 104, 250-254.
- III. Chedid, M., Waked, R., Haddad, E., Chetata, N., Saliba, G., & Choucair, J. (2021). Antibiotics in treatment of COVID-19 complications: a review of frequency, indications, and efficacy. *Journal of infection and public health*, 14(5), 570.
- IV. Miranda, C., Silva, V., Capita, R., Alonso-Calleja, C., Igrejas, G., & Poeta, P. (2020). Implications of antibiotics use during the COVID-19 pandemic: present and future. *Journal of Antimicrobial Chemotherapy*, 75(12), 3413-3416.
- V. Liu, C., Wen, Y., Wan, W., Lei, J., & Jiang, X. (2021). Clinical characteristics and antibiotics treatment in suspected bacterial infection patients with COVID-19. *International immunopharmacology*, 90, 107157.
- VI. Sulis, G., Batomen, B., Kotwani, A., Pai, M., & Gandra, S. (2021). Sales of antibiotics and hydroxychloroquine in India during the COVID-19 epidemic: An interrupted time series analysis. *PLoS medicine*, 18(7), e1003682.
- VII. Gagliotti, C., Buttazzi, R., Ricchizzi, E., Di Mario, S., Tedeschi, S., & Moro, M. L. (2021). Community use of antibiotics during the COVID-19 lockdown. *Infectious Diseases*, 53(2), 142-144.
- VIII. Leis, J. A., Born, K. B., Theriault, G., Ostrow, O., Grill, A., & Johnston, K. B. (2020). Using antibiotics wisely for respiratory tract infection in the era of covid-19. *bmj*, 371.
- IX. Yacouba, A., Olowo-Okere, A., & Yunusa, I. (2021). Repurposing of antibiotics for clinical management of COVID-19: a narrative review. *Annals of Clinical Microbiology and Antimicrobials*, 20(1), 1-8.
- X. Abu-Rub, L. I., Abdelrahman, H. A., Johar, A. R. A., Alhussain, H. A., Hadi, H. A., & Eltai, N. O. (2021). Antibiotics Prescribing in Intensive Care Settings during the COVID-19 Era: A Systematic Review. *Antibiotics*, 10(8), 935.
- XI. Comber, S. D., Upton, M., Lewin, S., Powell, N., & Hutchinson, T. H. (2020). COVID-19, antibiotics and One Health: a UK environmental risk assessment. *Journal of Antimicrobial Chemotherapy*, 75(11), 3411-3412.
- XII. Alzoubi, H., Alnawaiseh, N., Al-Mnayyis, A., Abu-Lubad, M., Aqel, A., & Al-Shagahin, H. (2020). COVID-19-knowledge, attitude and practice among medical and non-medical University Students in Jordan. *J Pure Appl Microbiol*, 14(1), 17-24.
- XIII. Hantoushzadeh, S., & Norooznezhad, A. H. (2020). Possible cause of inflammatory storm and septic shock in patients diagnosed with (COVID-19). *Archives of medical research*, 51(4), 347-348.
- XIV. Movahed, S. M. M., Akhavadegan, H., Dolatkhani, F., Nejadghaderi, S. A., Aghajani, F., Gangi, M. F., ... & Ghasemi, H. (2021). Different incidences of acute kidney injury (AKI) and outcomes in COVID-19 patients with and without non-azithromycin antibiotics: A retrospective study. *Journal of medical virology*, 93(7), 4411.