




Antimicrobial resistance: a problem aggravated by the COVID-19 pandemic

Resistencia antimicrobiana: una problemática agravada por la pandemia de COVID-19

Resistência antimicrobiana: um problema agravado pela pandemia de COVID-19

Adriel Herrero Díaz^{1*} , Sandra López Berrio^{II} , Elisa de la Caridad Román Herrera^I 

^IUniversidad de Ciencias Médicas de Villa Clara. Villa Clara. Cuba.

^{II}Hospital General Docente Mártires del 9 de abril. Departamento de Microbiología. Villa Clara. Cuba.

*Corresponding author: adriel.hd02@gmail.com

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December 2019 will be remembered as the genesis of an unprecedented pandemic during the 21st century: the COVID-19, whose etiological agent is the SARS-CoV-2 virus. This marked the beginning of a stage where, along with the development of the disease, another well-known phenomenon was on the rise: antimicrobial resistance (AMR).

The World Health Organization (WHO) recognizes this phenomenon as a real threat to global health systems, including it among the top ten problems with which the human species is struggling, with around 700,000 deaths each year. By the year 2050, infections caused by bacteria with a high level of resistance to various antimicrobials will cause around 10 million deaths annually, either directly or indirectly, which will surpass neoplasms as the leading cause of death, according to experts.⁽¹⁾

WHO estimates more than 769 million diagnosed cases and 6.9 million deaths from COVID-19 worldwide from December 2019 to August 2, 2023; however, the number is expected to rise even higher.⁽²⁾



SARS-CoV-2 promotes the progression of superinfections through the dysregulation of the immune system of the infected and the secondary proinflammatory state presented by patients with severe forms of the disease. The admission of these patients to intensive care units (ICU) meant the need to perform invasive procedures such as artificial ventilation, creating the perfect scenario for the development of numerous co-infections.⁽³⁾

Difficult access to reliable sources of information, fear, stress, lack of precise guidelines, among other factors, led many people to self-medicate with antibiotics as a possible miracle treatment for this virus, perhaps out of survival instinct; nothing could be further from the real purpose of these drugs. The disproportionate and inappropriate indication of antibiotics in the COVID-19 field, added to the already existing use of antibiotics in the livestock industry, are factors that have favoured the appearance of resistant germs and decreased the effectiveness of future therapies.⁽⁴⁾

In the modern era, the acquisition of medications has become a simple task, visiting any pharmacy is enough and the alarming thing is that several medications that should be controlled, whose use should be ordered only by qualified personnel, can be acquired through different ways.

The same thing happens with antibiotics; any person can take them by his or her own decision for any symptom that may require pharmacological treatment, perhaps the most common is the use of antimicrobials for flu, the use of which is not justified because of its viral origin. During the coronavirus pandemic, this fact increased notably.

Among the microorganisms that report higher levels of post-pandemic resistance are *Klebsiella pneumoniae*, *Klebsiella oxytoca*, *Pseudomonas aeruginosa*, *Streptococcus pyogenes* and *Staphylococcus aureus*. They have developed mechanisms to evade the effect of various antimicrobials, becoming a serious problem at different levels of care. *Klebsiella pneumoniae* has shown a marked resistance to carbapenems, a fact that has alarmed the international scientific community; therefore, it is not illogical to speak of a post-COVID AMR phenomenon.^(5,6)

In Latin America, more than a quarter of *S. aureus* isolates are methicillin resistant. The implications are excess mortality, increased expenditure on antibiotic treatment and increased hospitalization in all regions of the world.⁽⁷⁾ This global situation, complex as it is, has been compounded by the effects of the coronavirus.

This global situation, complex in itself, was compounded by the effects of the coronavirus, a phenomenon for which neither the population nor the health services were prepared. The complex scenario experienced during the pandemic years increased the proliferation and circulation of multidrug-resistant strains throughout the planet.



This has demonstrated the urgent need to work hard on the work agendas of each country, based on five fundamental objectives:

- Increase studies and efforts for the creation of new therapies and antimicrobial drugs capable of responding to the current needs of microorganisms.
- Allocate a larger budget by national, regional and international organizations for the unification of forces in the fight against AMR.
- To massify information, prevention and education campaigns, with a view to reducing negligent attitudes on the part of the population.
- Control the use of antibiotics in the livestock industry, with a view to their elimination.
- Prepare both health personnel and health systems for the arrival of future pandemics, which, like the most recent one produced by COVID-19, will hinder the fight against AMR.

Humanity has had bitter experiences with pandemics. Unfortunately, in the future new pandemics will threaten the human species, reversing the achievements in the field of science and health. A culture of risk is the key to preserving personal and community health. It is up to everyone to assume the right activities or suffer the consequences of ignoring them. The decision is in the hands of every citizen, every organization and every government. In the not too distant future, we may regret not having taken the necessary measures in time.

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