LETTER TO THE EDITOR

Abusive use of antibiotics and corticosteroids during COVID era and future impact on human health: A critical analysis

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Dear editor,
Given the initial unknowledge of the physiopathology of COVID-19, several patients received high doses of antibiotics and anti-inflammatory drugs to control the host response against the infection, particularly in the respiratory and circulatory systems (Calderón-Parra et al. 2021, Ikeda et al. 2021). However, adverse effects and complications have been reported, showing the worsening of clinical conditions and organic deficits (Conti et al. 2022). Therefore, we discuss some critical points concerning the impact of such drugs on human health and alternatives to prevent future problems.

Notoriously, the advent of antibiotics improved the management of infections and reduced their mortality rates. On the other hand, the reckless use of antibiotics has led to antibiotic-resistant organisms and difficult treatments (Chedid et al. 2021). The abusive use of antibiotics boosted by the pandemic may, consequently, pose the risk of bacterial coinfection or superinfection (Calderón-Parra et al. 2021). Currently, the major challenge to health systems worldwide revolves around the issue of multiresistant pathogens, which may fight back most drugs available in clinical practice (Chedid et al. 2021).

Another health issue concerns the long-term use of antibiotics. Prolonged use of antibiotics unbalanced natural microflora and caused dysbiosis in hospitalized SARS-CoV-2 positive patients (Riad et al. 2020). Because of the possible disruption to the microbiota homeostasis, the incidence of oral candidiasis has raised remarkably and, unfortunately, such condition correlates with bacterial pneumonia and the subsequent severity of the disease (Nakajima et al. 2020, Riad et al. 2020). Therefore, the pandemic may represent a "trigger" for more virulent strains and, in the worst-case scenario, for the ineffectiveness of antibiotic drugs.

Alternatively, measures to deal with such risks include employing prognostic biomarkers — such as procalcitonin — to assess the infection severity and rationalizing the use of antibiotics in patients with COVID-19 (Tong-Minh et al. 2022). Another satisfactory biomarker to control sepsis, septic shock, and organ failure is the mid-regional proadrenomedullin (MR-proADM). This peptide has shown a

high prognostic value, representing a viable method to identify low or high-risk patients and patients requiring hospital discharge or admission to the emergency room (Sozio et al. 2022). Despite the limited availability of biomarkers assessing physiological deterioration in the COVID-19 frame, several clinical trials have demonstrated that procalcitonin and proadrenomedullin show an expressive discriminatory ability to identify severe cases of infection. Thereby, in future COVID-19 outbreaks, these biomarkers may provide more effective treatment, with clinical decisions based on the severity of the disease, besides monitoring the risk of disease progression and mortality (de Montmollin et al. 2022, Moore et al. 2022).

Concerning the inflammatory response, corticosteroids reduce "cytokine storms" in COVID-19, a potential weapon to repair organic damages (Ikeda et al. 2021). Nevertheless, prolonged use of these drugs declines immune response and, consequently, increases the risk of diabetes (Guzmán-Castro et al. 2022) and viral-induced acute pulmonary exacerbations in mild COVID-19 cases (Ikeda et al. 2021).

Besides, the overuse of these drugs appears to be associated in moderate and severe cases of COVID-19 with clinical manifestations of previous infectious diseases, including cutaneous herpes simplex (HSV-1 and HSV-2) and black fungus, respectively (Guzmán-Castro et al. 2022, Santana et al. 2022). Thus, alternatives have been proposed to outline these adverse effects, supporting the need for guidance of immunotherapy, such as anti-cytokine treatment (IL-1 and IL-6), IFNγ treatment, and C5a blocking (Van de Veerdonk et al. 2022).

To conclude, vaccination has contributed to decreasing COVID-19 infections, deaths, and hospitalizations (Moghadas et al. 2021). Thus, the previously discussed pharmacological interventions should be particularly meaningful to severe cases and patients with incomplete vaccination. Joint efforts of the multidisciplinary health team and rigorous criteria relative to drug prescription are valuable. More than ever, the critical sense is vital to avoid a future sanitary crisis by multidrug-resistant pathogens and the deterioration of human health with drugs' unexpected effects.

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