



EDITORIAL

Sepsis: The two sides of the coin

Sepsis: las dos caras de la moneda

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The term sepsis derives from the Greek 'sipsis', which means putrefaction or decay of organic matter. As a medical term, the concept of sepsis has been in constant flux. The current definition derived from the 2016 Third International Consensus of definitions of sepsis considers sepsis as a life-threatening organ dysfunction caused by a dysregulation of the host response to an infection¹.

In the pathophysiology of sepsis, the infection that stimulates the immune system is identified as the primary origin, generating the production of inflammatory and anti-inflammatory cytokines that ultimately do not achieve a balance, impacting the function of other organs, which is why it is considered a dysregulated immune response. Therefore, hyperinflammation and immunosuppression in sepsis can be identified as concurrent events, making management difficult¹.

Sepsis is a public health problem worldwide, with an estimated 31.5 million cases annually and approximately 5.3 million deaths. In addition, it can generate other long-term consequences such as functional cognitive decline and reduced ability to develop independent activities^{2,3}.

Sepsis risk factors are found more frequently in older people, males, and Afro-descendants. This is related to the distribution of comorbidities and geographical aspects³. Among the comorbidities that increase the risk of sepsis is cancer, mainly due to immunosuppression induced by disease and treatments (chemotherapy, radiotherapy, bone marrow transplantation, etcetera)⁴. In addition to interventions with invasive devices that increase the entry routes for different microorganisms².

This edition presents a case report related to sepsis in a cancer patient, in which two critical aspects can be highlighted, one of them is the etiology of sepsis, and the other is precisely the relationship between cancer and sepsis.

Regarding the first aspect, it is observed that the etiological agent of sepsis is not conventional in the sense of a rarely reported species of fungus. However, it is known that immunosuppression is the possible cause of the increased risk of fungal infections, and *C. albicans* is the most frequent agent. However, it would be essential to start considering other species present, forcing us to broaden the search for the etiological agent to those microorganisms that are rarely reported^{5,6}.

Regarding the second aspect, the relationship between sepsis and cancer, there are controversies because some authors point to a type of benefit of sepsis as a stimulant of antitumor properties of the immune response. On the other hand, sepsis is presented as a generator of increased susceptibility to tumor growth. The possibility of seeing sepsis as a way of increasing the immune response against the tumor is not recent since immunotherapy against cancer began with Coley,⁷ who from experience with two patients who had tumors with complete remission after infections, launched the hypothesis that the infections that occurred induced the production of substances that caused the regression of the tumor, and created a mixture of *S. pyogenes* and *S. marcescens* that was later called Coley's toxin and approved by the Food and Drug Administration of the United States for clinical trials only⁷.

Subsequently, based on Coley's hypothesis, the use of Bacillus Calmette Guerin (BCG) was implemented in the treatment of bladder cancer, and

the possible mechanism of action of this therapy has recently been studied in depth⁸.

Recently, a case of the potential benefit of sepsis in a patient with prostate cancer was published⁹. Within the mechanisms that could explain how an infection influences the antitumor response, it is suggested that the induction of the inflammatory response with the production of cytokines could stimulate the cells of the immune system, such as natural killer cells, CD4 and CD8 T lymphocytes, those that could simultaneously attack tumor cells⁸. An example of this possible mechanism could be two cases of infections caused by SARS-CoV-2 in patients with lymphomas who later presented remission of the neoplasia^{10,11}.

At this point, sepsis could be considered a phenomenon with two unpredictable faces since it is unknown what elements or factors determine the death or recovery from the infection and the subsequent impact on immunosuppression or potentiation of the antitumor response. In this regard, and light of advances in personalized medicine, some studies have been carried out to identify biomarkers that predict sepsis outcomes^{12,13}.

In conclusion, sepsis has a profound impact on the physiology that influences the different comorbidities of a patient, which could lead to different results, so it could be considered the two sides of the same coin in such a way that it is necessary to deepen the mechanisms of occurrence, in the factors that influence the different outcomes so that treatments according to the situation of each patient are achieved.

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