



## EDITORIAL

### Early and adequate empirical antibiotic treatment in sepsis saves lives, but how should it be provided?☆



### La administración precoz y adecuada de la antibioticoterapia empírica en la sepsis salva vidas; pero ¿cómo hacerlo?

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As is classically mentioned, sepsis constitutes a global health problem, with a high incidence, highly variable presentation, and important mortality and morbidity in its advanced stages (severe sepsis/septic shock).

In the last decade, the mortality rate due to sepsis treated in Intensive Care Units has progressively decreased thanks to the application of a series of measures in the first hours of the disorder and to the organizational adaptation of hospitals with a view to ensuring early care of patients with sepsis.<sup>1</sup> At present, initial management of the disorder is based on three principles: (1) early and aggressive resuscitation measures; (2) the early introduction of empirical antibiotic treatment; and (3) drainage of the septic focus.

Regarding empirical antibiotic treatment, it has been repeatedly pointed out that a delay in administering the first dose in patients with septic shock<sup>2</sup> and in individuals with severe sepsis<sup>3</sup> is correlated to increased mortality. On the other hand, the administration of inadequate empirical antibiotic treatment is also associated to increased mortality.<sup>4</sup> As demonstrated by the excellent work of

Suberviola et al., which is published in this journal, the administration of early and adequate antibiotic treatment is independently and synergically correlated to improved survival rates. Despite the described improvements, however, a large percentage of septic patients continue to receive inadequate or late empirical antibiotic treatment (over 30% of the patients in the mentioned series received inadequate treatment or treatment with a delay of over 6 h)—with the resulting impact upon mortality (a 25% increase in absolute mortality and a 79% increase in relative mortality for inadequate late treatment). There is consequently much room for improvement, and an in-depth analysis of the problem and its possible solutions is needed.

The initial management of sepsis requires very early administration of the antibiotic treatment that is most likely to be effective. The decision making process must take into account the origin of the infection, the most common causal microorganisms, the local resistance patterns, the patient comorbidities and the degree of contact with the health-care system, the concomitant administration of other drugs, and the presence of organ dysfunctions that can modify the pharmacokinetics of the antibiotic, among other factors. Furthermore, decision making must often take place at times when junior physicians do not have the support of an expert in severe infections and/or sepsis. The antibiotic treatment decisions must be made along with the adoption of other therapeutic measures such as early resuscitation and drainage of the septic focus. All these requirements

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mean that it is difficult to follow the recommendation of the Surviving Sepsis Campaign<sup>5</sup> to “administer effective intravenous antibiotics within the first hour after identification of septic shock and severe sepsis”.

Given the complexity of the problem, it is relatively common to decide to use an antibiotic or combination of antibiotics with a broad spectrum of action, and at high doses. This “compromise solution” can offer advantages,<sup>6</sup> though it also involves a number of risks, such as an increase in possible adverse effects, increased bacterial resistances and, paradoxically, inadequate patient management. Such an initial solution obligatorily must be followed by evaluation of the microbiological results, in order to allow the introduction of guided therapy as soon as possible.

Considering the above, it is essential for each center to have local protocols for the prescription of empirical antibiotic treatment in cases of severe sepsis, taking into account the different factors that condition the choice of antibiotic and the different guidelines developed by the scientific societies. Likewise, in organizational terms, the severe sepsis patient should receive a specific code allowing immediate care, without the logistic problems affecting the availability of antibiotics in the Departments that routinely attend patients of this kind. The constant developments in rapid microbiological diagnostic techniques should also contribute to ensure the early identification of inadequate treatments.<sup>7</sup>

Improvement in antibiotic prescription practice in septic patients, which has an impact upon survival, thus requires the creation of multidiscipline teams to develop local empirical prescription protocols, apply early guided therapy, supervise the process, evaluate the results obtained, and introduce the necessary improvements.

## Conflicts of interest

The authors declare that they have no conflicts of interest.

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