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Sepsis and Organ Failure in Portugal

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Sepsis, defined as the host response to an infectious process, is one of the most frequent diagnoses in the intensive care unit (ICU), and when associated with organ system dysfunction, remains one of the most common causes of mortality in critical care. This paper reviews some of its characteristics in Portuguese ICUs.

A Portuguese prospective and multicenter study from 15 ICUs, including 701 patients (58% of them of medical with mean SAPS 38 ± 41), showed that, at admission, 34% of the patients were infected (Moreno et al. 1999). ICU and hospital mortality (20% and 30%, respectively), were significantly related to sepsis and septic shock. Organ dysfunction at ICU admission, assessed by SOFA score, was significantly associated with infection. There was also a correlation between SOFA score and mortality, sepsis and septic shock at admission or during ICU stay. At the same time, there were a number of patients with high SOFA scores, but without SIRS, sepsis or septic shock criteria.

Recently, another prospective multicenter study about community-acquired sepsis (CAS) in Portugal, included 2,643 ICU patients from 17 ICUs; 606 (23%) had CAS, 41% of the CAS patients had severe sepsis and 48% had septic shock (Carneiro et al. 2006). Microbiologically documented infection was found in 40% of patients. Septic patients had a longer ICU stay and a higher mortality rate than the control group. The authors concluded that there are now more patients admitted with CAS and more severe sepsis and septic shock, compared to previous, similar studies.

There are also other, international epidemiological studies with Portuguese data about: incidence of infections and sepsis (Alberti et al. 2002; Vincent et al. 2006), their influence on outcome (Alberti et al. 2003; Alberti et al. 2005) and incidence of organ dysfunction in ICU patients (Vincent et al. 1998). However, Portugal is poorly represented in these studies, and data from some of these studies is not published separately according to country of origin. Nevertheless, we can see in the Alberti study that, in 514 patients from three Portuguese centers with ICU stay longer than 24 hours, there was a high rate of infection on ICU admission (291 patients, 57%) and ICU acquired infections (122 patients, 24%) (Alberti et al. 2002). The SOAP study, which included 69 patients from 6 Portuguese ICUs, shows that 50 patients (73%) had sepsis and that 64% of them had severe sepsis (Vincent et al. 2006). ICU and hospital mortality of septic patients was high (32% and 38%, respectively), as was SAPS score ($46,2 \pm 14,8$). In this study, Portugal was the country with the highest frequency of sepsis and mortality.

The number of patients included in these studies is low and not representative of all Portuguese ICU patients. Nevertheless, Alberti et al. showed that, in Portugal, the rate of infection at ICU admission and during ICU stay is high, and the SOAP study observed a high rate of sepsis, severe sepsis and ICU and hospital mortality in Portuguese patients (Alberti et al. 2002; Vincent et al. 2006). How could we explain these results? Mortality rate in septic patients is almost double of that of nonseptic patients, because septic patients are generally more ill. However, this is not the sole explanation, because association between sepsis prevalence and mortality is stronger than between mortality and severity of disease measured by SAPS II (Warren and Ferguson 2006). The SOAP study's finding that there is an association between the degree of organ dysfunction and number of failing organs and mortality, already noted by Vincent (Vincent et al. 1998), suggests that organ failure was elevated in the Portuguese population, given the observed mortality in these patients. Differences in case-mix, admission criteria, pre- ICU and ICU resource utilization, widespread antibiotic use and subsequent impact on multiresistant microorganisms may also account for poor outcome in Portugal's septic patients.

In Portugal, there are few studies on the epidemiology of community, hospital and ICU-acquired infection and organ dysfunction in critical care patients. However, one can carefully state that there is a high severity of infection, sepsis and organ failure in this country that can not be explained just by differences in study protocols and methodology. Further research is needed to better identify the factors that contribute to this phenomenon and to take action in order to decrease mortality for severe infection and organ failure in Portugal. 4

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