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A New Age for Sepsis/Septic Shock Diagnosis and Management?

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On March 27th, 2012, Rory Staunton, 12 years old, is playing with his friends. Then he falls and procures a bruised arm. His mother disinfects and put a band-aid on the wound. During the following hours the boy did worse seriously, although he was visited and treated at hospital. The case was under estimated until it was too late. It resulted an undiagnosed case of sepsis [J. Dwyer, The New York Times, July 11, 2012]. From such a case we can learn some things: 1) people does not know "sepsis"; 2) doctors have not yet a tool to early diagnose sepsis, without blood sample tests; 3) "Time" is the most precious variable [1,2].

So, let's try take stock of the situation.

On April 2014 the New England Journal of Medicine published the results of the trial ProCESS (Protocolized Care for Early Septic Shock): a multi centers study conducted on 1341 patients of 31 academic hospitals of United States [3]. The trial compared three different way to approach and care the septic shock during the first 6 hs: 1) A protocol based on the Early Goal Directed Therapy (EGDT), that we learned from the study of Rivers, et al. and subsequently included into the guidelines of the Surviving Sepsis Campaign (SSC), [4,5]; 2) A less aggressive protocol Standard Therapy (ST) which based more on fluid therapy and systolic blood pressure (SBP) target than on other haemodynamic monitoring targets; 3) The "usual care" protocol which therapy based on a not-protocolized treatment, then according the personal experience of the team who took care of the patient. All the adult patients were enrolled within 6 hs from the suspected sepsis or within 2 hs from the diagnosis of septic shock, if they matched > 2 items defining a Systemic Inflammatory Response Syndrome (SIRS) and who had refractory hypotension (SBP < 90 mmHg or > 90 mmHg after fluid load and vasopressor administration) or hyperlactatemia (> 4 mmol/L) [3].

The main result was that mortality at 60-90-365 days did not show any difference. Common items were that patients received large-spectrum antimicrobial therapy within 3 hs (76%) or 6hs (97%). The Editorial by Lilly CM focused on the importance of the early antimicrobial therapy to make survival increasing in all the groups of patients. The ProCESS trial defined the lower boundaries of fluid therapy avoiding the risk of renal failure due to a too low treatment or pulmonary impairment due to a fluid overload. Furthermore, ProCESS trial showed again that hemodynamic monitoring does not affect the outcome [6].

Given similar results from other trials (ARISE, ProMISE [7,8]), an international consensus for a revision of the sepsis/septic shock treatment was considered deserving. In fact, recently, the Society of Critical Care Medicine and the European Society of Intensive Care Medicine convened a task force to revise the definition of sepsis/ septic shock (Sepsis-3) [9,10].

The Sepsis-3 pointed out "…septic shock is defined as a subset of sepsis in which underlying circulatory, cellular, and metabolic abnormality are associated with a greater risk of mortality than sepsis alone." The task force reports that in septic shock patients, mortality risk rises (OR 1.4) when lactatemia > 2 mmol/L after fluid resuscitation. Then we have to lower the lactatemia alert threshold we learned from Rivers, et al., as it permits to doctors to detect the harm of sepsis earlier than in the past. Finally, after the analysis of a very large database, trials and meta-analyses, Sepsis3-Task Force provide a tool for an early detection of patient potentially affected by sepsis: the so called "quick-SOFA" (qSOFA), a kind of score that includes only 3 items: 1) the respiratory rate > 22/min; 2) altered mentation; 3) systolic blood pressure < 100 mmHg. An adult patient with two of these clinical symptoms may suffer from an upcoming severe infection [10].

A new era is starting to verify whether qSOFA is really helpful as a tool to early identify patients with an infection, to "buy time" that we will use for an appropriate antimicrobial therapy precociously. Will it contribute to reduce sepsis mortality? I think only Time will answer the question.

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