



## LETTERS TO THE EDITOR

### Sepsis biomarkers in severe burn patients: Cut-off point or time profile?



### Biomarcadores de sepsis en pacientes quemados graves: ¿punto de corte o perfil temporal?

Dear Editor,

In regard to the review article on “Infections in critically burn patients” by Hidalgo et al., we agree on the importance of developing new strategies to improve the infection diagnosis and management of these patients.<sup>1</sup>

We concur on the lack of evidence in the use of serum biomarkers to differentiate Systemic Inflammatory Response Syndrome (SIRS) from sepsis in this population. Probably, this situation is a consequence of several factors. Firstly, sepsis diagnosis is difficult after severe thermal injury and requires the use of strict criteria described by the American Burn Association in 2007.<sup>2</sup> Secondly, authors exploring the utility of specific biomarkers of infection fail to apply the same sepsis yardstick,<sup>3–5</sup> therefore published studies revealed a high level of heterogeneity. It would be due to classical sepsis definition, which includes little pathophysiological information.<sup>2,6</sup> Lastly, mention that our group has explored the role of C-Reactive Protein (CRP) and Procalcitonin (PCT) for sepsis diagnosis in a small population of patients with severe burn injury.<sup>7</sup> Our results show that the role of PCT in identifying infectious processes in critically burned patients is superior to CRP. Specifically, we found that increases in PCT levels showed a better discriminatory capacity for detecting sepsis, as compared to changes in CRP levels. Consequently, we consider that use of static cut-off points in this complex situation provides less information than temporal changes.

Hopefully, in the next years, through well designed multicenter studies in severe burn injury patients, we would be able to validate our hypothesis and to demonstrate that temporal profile of serum biomarkers might identify high-risk patients of sepsis after severe burn injury guiding antibiotic treatment accordingly in our intensive care units.

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### Conflicts of interest

The authors declare no conflict of interest.

### References

1. Hidalgo F, Mas D, Rubio M, Garcia-Hierro P. Infections in critically ill burn patients. *Med Intensiva*. 2016;40:179-85.
2. Lavrentieva A, Kontakiotis T, Lazaridis L, Tsotsolis N, Koumis J, Kyriazis G, et al. Inflammatory markers in patients with severe burn injury. What is the best indicator of sepsis? *Burns*. 2007;33:189–94.
3. von Heimburg D, Stieghorst W, Khorram-Sefat R, Pallua N. Procalcitonin – a sepsis parameter in severe burn injuries. *Burns*. 1998;24:745–50.
4. Barati M, Alinejad F, Bahar MA, Tabrisi MS, Shamshiri AR, Bodouhi NO, et al. Comparison of WBC, ESR, CRP and PCT serum levels in septic and non-septic burn cases. *Burns*. 2008;34:770–4.
5. Lavrentieva A, Papadopoulou S, Kioumis J, Kaimakamis E, Bitzani M. PCT as a diagnostic and prognostic tool in burn patients. Whether time course has a role in monitoring sepsis treatment. *Burns*. 2012;38:356–63.

6. Levy MM, Fink MP, Marshall JC, Abraham E, Angus D, Cook D, et al. 2001 SCCM/ESICM/ACCP/ATS/SIS International Sepsis Definitions Conference. *Crit Care Med.* 2003;31:1250–6.
7. Egea-Guerrero JJ, Martínez-Fernández C, Rodríguez-Rodríguez A, Bohórquez-López A, Vilches-Arenas A, Pacheco-Sánchez M, et al. The utility of C-reactive protein and procalcitonin for sepsis diagnosis in critically burned patients: a preliminary study. *Plast Surg (Oakv).* 2015;23:239–43.

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## Author's reply



### Respuesta de los autores

We read with interest the letter sent by JJ Egea-Guerrero et al. The authors agree to the comment of the review<sup>1</sup> that the routine use of biomarkers cannot be recommended in the differential diagnosis of inflammation from sepsis. The same conclusion has been achieved by Seoane et al. in a recent article.<sup>2</sup>

Egea-Guerrero et al. refer to one preliminary report about the diagnostic value of C-Reactive Protein and Procalcitonin<sup>3</sup> in this population. The authors processed and analyzed 157 samples of 17 severe burn patients. The authors suggested that changes in Procalcitonin over time differentiated patients with sepsis and patients without sepsis only based in the ROC curves, but they did not provide data of sensitivity, specificity and likelihood ratios of different cut-off values that could help clinicians in differential diagnosis. We agree with them that it is necessary new well-designed studies to provide new insights on this topic.

### Conflict of interest

None declared.

## References

1. Hidalgo F, Mas D, Rubio M, Garcia-Hierro P. Infections in critically ill burn patients. *Med Intensiva.* 2016;40(3):179–85.
2. Seoane L, Pérttega S, Galeiras R, Astola I, Bouza T. Procalcitonin in the burn unit and the diagnosis of infection. *Burns.* 2014;40:223–9.
3. Egea-Guerrero JJ, Martínez-Fernández C, Rodríguez-Rodríguez A, Bohórquez-López A, Vilches-Arenas A, Pacheco-Sánchez M, et al. The utility of C-reactive protein and procalcitonin for sepsis diagnosis in critically burned patients: a preliminary study. *Plast Surg (Oakv).* 2015;23:239–43.

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