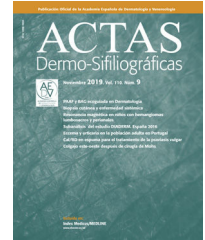




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RESIDENT FORUM

[Translated article] RF—Procalcitonin: An extremely useful biomarker in dermatology

FR—Procalcitonina: una prueba complementaria extraordinariamente útil en dermatología

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PALABRAS CLAVE

Procalcitonina;
Infección bacteriana;
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Early diagnosis of a severe infection in a patient with inflammatory dermatosis and systemic symptoms may pose a challenge for dermatologists. Some clinical and analytical signs and symptoms, such as fever, leukocytosis, or raised levels of acute-phase reactants such as C-reactive protein (CRP) are sometimes not useful, as they are often secondary

to the associated inflammation. Unfortunately, bacterial cultures are slow and of variable sensitivity. Identifying the presence of an infection is essential, as inflammatory dermatosis will require immunosuppressive or immunomodulatory treatment and the bacterial infection will require antibiotic treatment. Could procalcitonin (PCT) be a solution?

PCT is a precursor protein of calcitonin that is secreted by thyroid C cells. It has no hormonal activity and reaches levels in blood of less than 0.005 $\mu\text{g/L}$ in healthy individuals.^{1–3} In a bacterial infection, multiple proinflammatory cytokines are released, including tumor necrosis factor α and interleukins 6 and 8, which stimulate production of PCT in different tissues, increasing levels in serum.^{1–3}

In recent decades, many studies have supported the value of PCT in diagnosing bacterial infections.³ Its utility in some dermatologic processes has recently been reported (Table 1). Koh et al.⁴ performed a retrospective study of the predictive factors of sepsis in 176 patients with Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN). Hypothermia and PCT of 1 $\mu\text{g/L}$ or higher were the only 2 predictive markers for bacteremia. In a retrospective study of 42 patients with SJS, Wang et al.¹ showed that levels of PCT were higher in subjects with a systemic bacterial infection than in subjects with a cutaneous infection

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Table 1 Characteristics of procalcitonin and its potential use in dermatology.

Characteristics	Precursor protein of calcitonin, with no hormonal activity, secreted by thyroid C cells ¹⁻³
Mechanism of production in bacterial infection	Proinflammatory cytokines (TNF- α , IL-6 and IL-8) stimulate production in different tissues ¹⁻³
Principal utility	Ruling out bacterial infection (high NPV ^a)
Optimum cutoff points in dermatologic pathology	SJS-TEN: 0.65 μ g/L (SE, 84.6%; SP, 89.7%) ¹ Neutrophilic dermatoses (SS, PP, AGEP): 1.3 μ g/L (SE, 100%; SP, 79.4%) ² PP: 1.5 μ g/L (SE, 75%; SP, 100%) ⁵

Abbreviations: AGEP indicates acute generalized exanthematous pustulosis; IL-6, interleukin 6; IL-8, interleukin 8; NPV, negative predictive value; PP, psoriasis pustulosa; SE, sensitivity; SJS-TEN, Stevens Johnson syndrome-toxic epidermal necrolysis; SP, specificity; SS, Sweet syndrome; TNF- α , tumor necrosis factor alfa.

^a Given its high NPV, a PCT below the cutoff value practically rules out sepsis or severe systemic bacterial infection.

or with no infection. Those authors determined that PCT levels in excess of 0.65 μ g/L identified a bacterial infection with a sensitivity of 84.6% and a specificity of 89.7%. Yeo et al.² also performed a retrospective evaluation of the predictive value of PCT as a marker of severe bacterial infection in 41 patients with neutrophilic dermatosis and systemic symptoms (Sweet syndrome, pustular psoriasis, and acute generalized exanthematous pustulosis). The optimum cutoff was established at 1.3 μ g/L, with a sensitivity of 100%, a specificity of 79.4%, a negative predictive value of 100%, and

a positive predictive value of 50%. In a retrospective study of 64 individuals with generalized pustular psoriasis, Wang et al.⁵ determined that a PCT of greater than 1.5 μ g/L was able to identify a bacterial infection with a sensitivity of 75% and a specificity of 100%. In everyday clinical practice, most laboratories consider a PCT of greater than 0.5 μ g/L to be abnormal, as it is associated with high sensitivity and a high negative predictive value. This means that a PCT of less than 0.5 μ g/L practically rules out sepsis or severe systemic bacterial infection. The optimum discriminatory level of PCT in inflammatory dermatosis may be higher, as discussed above.

Identifying a bacterial infection in patients with inflammatory dermatosis is important and difficult. Determining PCT may be extraordinarily useful. The optimum discriminatory value for PCT varies depending on the dermatosis and ranges between 0.5 and 1.5 μ g/L.

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