work and Mount Sinai Hospital, University of Toronto, Toronto, Ontario, Canada; Fernando Frutos Vivar, MD, Andrés Esteban, MD, PhD, Unidad de Cuidados Intensivos, Hospital Universitario de Getafe, Madrid, Spain

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Clinical Relevance of the LRINEC (Laboratory Risk Indicator for Necrotizing Fasciitis) Score for Assessment of Early Necrotizing Fasciitis

To the Editor:

Early diagnosis of necrotizing fasciitis with subsequent operative debridement has been shown in many studies to improve survival (1, 2). However, delayed diagnosis is frequently seen because early in the evolution of this disease, it is often clinically indistinguishable from other more benign soft-tissue infections such as cellulitis. We developed the Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score (3) with the hope that routine laboratory parameters for the assessment of severe soft-tissue infection may yield diagnostic clues of the presence of necrotizing soft-tissue infection, even early in the evolution of the disease when clinical findings were nondiagnostic.

The LRINEC score was developed retrospectively by comparing the laboratory parameters (complete blood count, electrolytes, erythrocyte sedimentation rate, and C-reactive protein) of patients with proven necrotizing fasciitis vs. patients with severe soft-tissue infections. On validation with our own data, at a cutoff of a LRINEC score of ≥ 6, the score has a positive predictive value of 92.0% and negative predictive value of 96.0% (3). One weakness of this study we acknowledge is its retrospective nature that predisposes the study to selection bias (4). Prospective validation of the score is needed before routine application can be recommended.

Wang and Hung (5) recently performed a prospective study using tissue saturation monitoring for diagnosing necrotizing fasciitis. A total of 234 consecutive patients who fulfilled the United States Centers for Disease Control and Prevention criteria of soft-tissue infections were enrolled into the study. Of these 234 patients, 19 were later confirmed to have necrotizing fasciitis and 215 patients had cellulitis. Routine parameters for evaluation of soft-tissue infection were taken at admission. In this study, the majority of cases were early necrotizing fasciitis. Early diagnosis was possible because of a rigorous protocol that combined tissue oxygen saturation monitoring, computed tomographic scanning, and tissue biopsy. As a secondary analysis, Dr. Wang (6) used the LRINEC score in his study subjects and found a positive predictive value of 40% and a negative predictive value of 95%.

The performance of the LRINEC score in this prospective model shows a high specificity but a low sensitivity. The implications are two-fold. First, the majority Dr. Wang's patients had early necrotizing fasciitis. A negative predictive value of 95% (a low false-negative rate) shows that the LRINEC score will not miss these cases (early necrotizing fasciitis). Second, from a clinical standpoint, specificity is more important than sensitivity. To this end, the LRINEC score seems to fulfil the purpose for which it was originally devised. When the score is <6, necrotizing fasciitis is quite unlikely. From Dr. Wang's data of a positive predictive value of 40%, a high false-positive rate is expected for early necrotizing fasciitis. For patients classified as high risk based on the LRINEC score, urgent further evaluation is needed. The use of additional tools, such as computed tomography, magnetic resonance imaging, tissue biopsy, or tissue oxygen monitoring can exclude or confirm necrotizing fasciitis. The LRINEC score therefore functions as tool to limit and more importantly target the use of these expensive (but more sensitive) modalities to such high-risk patients. We hope that early diagnosis and reduction in mortality is possible with such an approach.

Chin-Ho Wong, MD, MRCS(Ed), Department of Plastic, Reconstructive and Aesthetic Surgery, Singapore General Hospital, Singapore; Lay-Wai Khin,MD, MSC, Clinical Trials and Epidemiology Research Unit, National Medical Research Council (NMRC), Ministry of Health, Singapore

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