Evaluation of the Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) Score for Detecting Necrotizing Soft Tissue Infections in Diabetic Patients with Lower Extremity Infection

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Statement of Purpose

The Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score is used to distinguish necrotizing fasciitis from other soft tissue infections. LRINEC score was developed to detect necrotizing infections based on white blood cell count, glucose, hemoglobin, serum creatinine, sodium, and c-reactive protein. The aim of this study is to assess the ability of LRINEC to diagnose necrotizing fasciitis from other infections of the lower extremity in patients with diabetes.

Methodology and Procedures

From September 2017 to November 2018, 65 patients with diabetes mellitus presenting to the emergency department at the University of Cincinnati with concern for lower extremity infection and requiring surgical intervention were prospectively enrolled in the study. C-reactive protein, white blood cell count, hemoglobin, sodium, creatinine, and glucose were measured. The LRINEC score was then calculated and compared to the patient's clinical presentation to determine the usefulness of the score. Logistic regression was performed on each laboratory value. A diagnosis of necrotizing infection was defined by either clinical judgment or by specimen assessment by a board certified pathologist.

Level of Evidence

Level II: Prognostic Study

Literature Review

Diabetic foot wounds and infections are increasingly common due to a compromised host with neuropathy and abnormal biomechanics , and the ability to recognize an aggressive, necrotizing infection early in the course is crucial. However, early detection may be more difficult in the diabetic patient as in this patient population many clinical and laboratory findings that raise suspicion for NSTI may be absent. The profound neuropathy, electrolyte abnormalities including hyperglycemia and hyponatremia, diabetic nephropathy, and anemia may all lead to a delay in recognition and treatment of diabetics with necrotizing soft tissue infection (NTSI). Diabetes has also been associated as the most common comorbidity (70.8%) in a study of 87 patients with NSTI's. The necessity for early intervention in patients with NSTI has been well documented and delay in treatment has been shown to lead to an increased mortality.

Figure 1. (Above): Patient with a necrotizing soft tissue infection of the left foot

Literature Review Continued

Figure 2. (Above) Post debridement of a necrotizing soft tissue infection of the left lower extremity

LRINEC Lab Variable	P-value
C-reactive protein	**0.02**
White blood count	**0.007**
Hemoglobin	<u>0.8</u>
Sodium	*0.01*
Creatinine	<u>0.8</u>
Glucose	<u>0.12</u>
Total LRINEC score	**0.013**

Table 1. (Above): alpha = 0.05
Positive association: **Bold**
Negative association: *Italics*
No association: <u>Underlined</u>

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No financial conflicts of interest to disclose

Results

There was a significant positive association between the LRINEC score and diagnosis in patients with diabetes. Two variables showed significant positive associations (White blood cell count, p=0.007 and C reactive Protein, p=0.02) when compared to the specimen assessment by a pathologist. Sodium was a negative association and all other variables had no significant association. Lab variables are present in Table 1.

Analysis and Discussion

Due to multiple co morbidities, our patient population's baseline laboratory values are abnormal, thus making many of the lab values of the LRINEC less reliable in this population; heavy emphasis should be made on clinical suspicion as well as white blood count and C reactive protein values when diagnosing necrotizing soft tissue infections.

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