Introduction

Necrotizing fasciitis (NF) is a rare, complex disease with a mortality rate between 25-35%. Typically, the infecting agent invades the soft tissues, aggressively attacking deep soft tissue layers with resultant liquefaction within hours of the initial exposure. Early diagnosis is key to lowering mortality rates. However, disease rarity, along with the inverse relationship of physical exam to symptom severity may contribute to a delay in diagnosis and treatment. The gold standard treatment includes emergent fasciectomy, serial débridements, broad spectrum antibiotics, local wound care, and eventual skin grafting. In this case study, a 49-year-old male presented with acute NF of the left lower extremity. A novel antimicrobial formula was employed in the treatment protocol.

Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Score</th>
<th>Time</th>
<th>Score</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creatinine</td>
<td>≥2.0 mg/dL</td>
<td>4-hour</td>
<td>≥2.0 mg/dL</td>
<td>4-hour</td>
</tr>
<tr>
<td>White blood cell count (WBC)</td>
<td>≥12,000/μL</td>
<td>1-hour</td>
<td>≥12,000/μL</td>
<td>1-hour</td>
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<tr>
<td>Monocytes</td>
<td>≥1.1-1.55</td>
<td>48-hour</td>
<td>≥1.1-1.55</td>
<td>48-hour</td>
</tr>
<tr>
<td>Neutrophils</td>
<td>≥255/mm³</td>
<td>1-hour</td>
<td>≥255/mm³</td>
<td>1-hour</td>
</tr>
<tr>
<td>Lactate dehydrogenase</td>
<td>≥13 mg/dL</td>
<td>2-hour</td>
<td>≥13 mg/dL</td>
<td>2-hour</td>
</tr>
<tr>
<td>Total glucose</td>
<td>≥100 mg/dL</td>
<td>1-hour</td>
<td>≥100 mg/dL</td>
<td>1-hour</td>
</tr>
</tbody>
</table>

*LRINEC score of ≥6 correlates with a 93.4% likelihood of NF infection.

Case Report

12/9/16 (7:29pm)

- 49-year-old Hispanic male with complaints of shortness of breath and leg pain. Hemoglobin decreased from 14.6 g/dL to 10.6 g/dL. Laboratory tests showed anemia, hypokalemia, and lactic acidosis.
- In the emergency department, broad spectrum antibiotics, and salvage cells were administered. Serum creatinine increased from 0.7 to 1.2 mg/dL.

Results

12/9/16-12/10/17

- White blood cell count (WBC) was 23x10³/μL. Wound cultures positive for beta-hemolytic group A strep.
- Serum creatinine increased to 1.5 mg/dL, serum potassium decreased, giving a LRINEC score of 8. 
- Diagnostic Septic shock secondary to NF of the lower extremity.
- Treatment: To OR for emergent débridement and fasciectomy.

12/15/16 (11:00pm)

- Intra-op Erythema, edema, and liquefaction of LIE.
- Extensive lesions from the mid thigh medially and laterally down to the ankle. Significant pusulence in the subcutaneous tissues and surrounding fascia.
- Post-op: WBC rose to 25x10³/μL/mL. Wound cultures positive for beta-hemolytic group A strep. Broad spectrum IV antibiotics began.

12/21/17

- Follow up débridement and salvage procedure with Venetan. Negative pressure therapy applied to avoid fluid collection. Post-op IV antibiotics continued.
- WBC 10x10³/μL/mL. Concern about viability of limb.

12/24/17

- Post-surgical WBC reduced to 22x10³/μL/mL.
- Post-op IV antibiotics continued. Daily dressing changes with Hexagen, Adaptic, and Kerlix.
- Wound improved. WBC decreasing.

12/28/17

- MORE intra-op débridement performed with application of split-thickness skin graft harvested from right thigh. Hexagen, Adaptic, and negative pressure therapy applied to the grafted wound base.
- IV antibiotics continued. Post-surgical WBC reduced to normal (10x10³/μL/mL).

1/2/17

- Patient discharged from hospital with daily dressing changes of Hexagen, Adaptic, Kerlix, and light ACZ wraps.

2/12/17

- 6-week post-op evaluation: Patient returned to work as a construction worker at a normal activity level.

Discussion

Necrotizing fasciitis (NF) is a limb and life-threatening soft tissue infection with acute onset and rapid progression. The rapidly progressive nature of NF requires prompt aggressive surgical débridement and antimicrobial therapy. The gold standard treatment includes emergent fasciectomy, serial débridements, broad spectrum antibiotics, local wound care, and eventual skin grafting. In this case study, a 49-year-old male presented with acute NF of the left lower extremity. A novel antimicrobial formula was employed in the treatment protocol.

References

5) Marshack F, Glueck J, Woodward S. Are there any reasons to change our behavior in necrotizing fasciitis with the advent of new antibiotics? Curr Opin Infect Dis (2017), 30:172−179. DOI:10.1097/COI.0000000000000477
6) Alexander R. Perez DPM, MSW, Alexander R. Perez DPM, Jack B. Yuan DPM, Herbert Dardik MD FACS, Thomas Bernik MD FACS