A Retrospective Study of Monocyte Distribution Width (MDW) in the Outcomes of Patients with COVID-19

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Background

• Sepsis is a major cause of mortality, and early recognition has been shown to improve outcomes.
• Monocytes play a crucial role in the innate immune response to infection.
• MDW describes size of circulating monocytes, and is calculated from a complete blood count.

Methods

STUDY GROUP
In the ED, patients presented with positive PCR testing for COVID-19.

DATA EXTRACTION
Utilized the EHR system using ICD-CM-10 coding for acute respiratory failure and sepsis.

STATISTICAL ANALYSIS
Data evaluated in terms of the area under the curve (AUC), ROC analysis, sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV).

Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sepsis</th>
<th>No Sepsis</th>
<th>t (95% C.I.)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDW</td>
<td>25.50 ± 5.930</td>
<td>23.13 ± 4.460</td>
<td>-3.13 (-3.87, -0.86)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Ferritin</td>
<td>858.5 ± 1164</td>
<td>638.8 ± 826.4</td>
<td>-1.17 (-593, 154)</td>
<td>0.25</td>
</tr>
<tr>
<td>D-dimer</td>
<td>7560 ± 17690</td>
<td>1933 ± 3732</td>
<td>-2.38 (-10335, -900)</td>
<td>0.02</td>
</tr>
<tr>
<td>Pro-cal</td>
<td>2.910 ± 6.100</td>
<td>0.950 ± 4.470</td>
<td>-2.28 (-3.68, -0.25)</td>
<td>0.02</td>
</tr>
<tr>
<td>Lactic acid</td>
<td>2.330 ± 1.880</td>
<td>1.640 ± 0.840</td>
<td>-2.91 (-1.16, -0.22)</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

• For detecting sepsis, MDW did not correlate with other inflammatory markers.
• MDW had the highest negative predictive value for death at 95%, and was 85% for sepsis.

Discussion

• In the emergency room, MDW is easily obtained from routine lab evaluations and has the potential to be a useful tool in the triage of COVID-19 patients.
• Future studies will be aimed at how MDW pertains to other disease processes, such as leukemia, lymphoma, etc.