Lack of Correlation Between Cardiac Magnetic Resonance Imaging and Endomyocardial biopsy in Immune Checkpoint Inhibitor-Associated Myocarditis

Nicolas Palakas MD, Juan Lopez-Mattei MD, Cezar Iliescu MD, Anita Deswal MD, MPH
Department of Cardiology, Division of Internal Medicine, University of Texas MD Anderson Cancer Center, Houston, Texas

Background

- Endomyocardial biopsy (EMB) is the current gold standard for diagnosis of immune checkpoint inhibitor (ICI) myocarditis
- EMB is invasive with risk of serious complications in <1% of cases
- Cardiac magnetic resonance imaging (CMR) is a non-invasive test that has established criteria for the diagnosis of myocarditis, with a high reported diagnostic accuracy in general myocarditis
- The role of CMR compared to EMB for the detection of ICI-associated myocarditis has not been examined

Objective

- To examine the agreement between CMR and EMB in immune checkpoint inhibitor-associated myocarditis

Methods

- Retrospective study evaluating all patients who had an EMB and were on or had received ICI between January 1, 2018 and May 31, 2018
- At our institution an EMB with 4 to 6 specimens is standard for patients with suspected ICM myocarditis
- Contraindications to EMB
  - Platelets <50,000, INR=2, lack of large vein access, clinically unstable, patient refusal
  - Cardiac pathologists trained in heart transplant rejection reviewed all EMB for the diagnosis of myocarditis defined by inflammatory infiltrate
  - CMR images were acquired using a 1.5T MRI scanner GE AW (Milwaukee, WI)
  - All CMR images were evaluated by a cardiologist board-certified in CMR. Myocarditis was evaluated using the Updated Lake Louise Criteria (2 out of 2 with supportive criteria)
  - CMR that met 2 out of 2 main criteria or met 1 main criterion and had supporting evidence were recorded as positive for myocarditis

Results

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Baseline Demographics and Cardiac Studies</th>
<th>EMB Positive</th>
<th>EMB Negative</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presenting LVEF (%)</td>
<td>n=18</td>
<td>n=10</td>
<td>n=28</td>
<td>n=28</td>
</tr>
<tr>
<td>&lt;40%</td>
<td>6/18 (33%)</td>
<td>2/10 (20%)</td>
<td>8/28 (29%)</td>
<td>14/28 (50%)</td>
</tr>
<tr>
<td>40-50%</td>
<td>7/18 (39%)</td>
<td>8/10 (80%)</td>
<td>15/28 (54%)</td>
<td>21/28 (75%)</td>
</tr>
<tr>
<td>&gt;50%</td>
<td>5/18 (28%)</td>
<td>0/10 (0%)</td>
<td>5/28 (18%)</td>
<td>8/28 (29%)</td>
</tr>
</tbody>
</table>

Conclusions

- The correlation of CMR and EMB in patients with ICM myocarditis appears lower than reported for myocarditis in general
- Patchy immune cell infiltration in ICI myocarditis may result in false negative EMB
- At present, clinicians should consider performing both CMR and EMB for evaluation of clinically suspected ICM myocarditis

References


Disclosures

The authors have no relevant disclosures.