Control Number: 66

Abstract Category: Clinical Science in Cardio-Oncology

Title: Lack of Correlation between Cardiac Magnetic Resonance Imaging and Endomyocardial Biopsy in Immune Checkpoint Inhibitor-Associated Myocarditis

ABSTRACT BODY

Background

The gold standard diagnostic test for immune checkpoint inhibitor-associated (ICI) myocarditis is endomyocardial biopsy (EMB), but this is an invasive test with a 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 diagnostic accuracy. However, these are not specific to ICI myocarditis. Our aim was to examine the correlation between EMB and CMR in patients with ICI myocarditis.

Methods

We conducted a retrospective study evaluating all patients who had an EMB and were on or had received ICI between January 1, 2018 and May 31, 2019. At our institution an EMB with 4 to 6 specimens collected is standard for patients with suspected ICI myocarditis, barring any contraindications (platelets<50,000, INR >2, lack of venous access, clinically unstable) or patient refusal. Cardiac pathologists reviewed all EMB for the diagnosis of myocarditis defined by inflammatory infiltrate. A cardiologist board-certified in CMR reviewed all CMR performed during the same hospitalization as EMB, and was blinded to the EMB results. All CMR images were acquired using a 1.5T MRI scanner GE AW (Milwaukee, WI) and Lake-Louise criteria were used for the diagnosis of myocarditis.

Results

Of the 28 EMB performed, 17 (61%) of the patients also had CMR performed. Of the 18 patients with EMB positive for myocarditis, 50% had CMR performed and only 22% of these had evidence of myocarditis by CMR. On the other hand, of the 17 patients with suspected ICI myocarditis who underwent CMR, 35% had CMR findings suggestive of myocarditis and only 33% of these had EMB findings of myocarditis (Figure). The 4 patients with CMR positive for myocarditis and negative by EMB noted focal myocarditis regions of the left ventricle that were not in the septal wall.

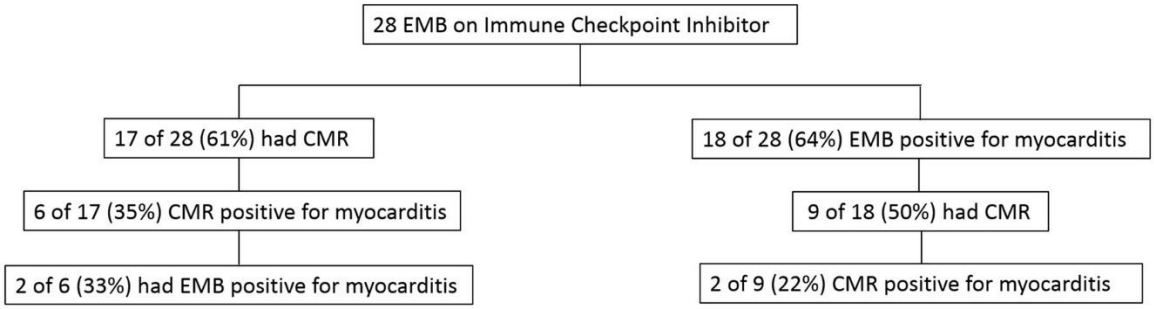
Conclusion

The correlation of CMR and EMB is patients with ICI myocarditis appears lower than reported for myocarditis in general. Patchy immune cell infiltration in ICI myocarditis may result in false negative EMB.

Clinical Implications

Clinicians should consider performing both CMR and EMB for evaluation of clinically suspected ICI myocarditis.

Image 1



EMB- Endomyocardial Biopsy; CMR- Cardiac Magnetic Resonance Imaging