Utility of 18F-FDG PET/CT in evaluation of Staphylococcus aureus bacteremia

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Staphylococcus aureus bacteremia (SAB) is often complicated by metastatic infection. Metastatic foci of infection can be asymptomatic in up to two thirds of patients and are associated with higher morbidity and mortality.

PET/CT has high diagnostic accuracy in the evaluation of granulomatous bloodstream infection. In SAB, PET/CT may lead to earlier detection of infectious foci, lower relapse rates,1 and improved three-month mortality.2 Prompt diagnosis of distant sites of infection is key to appropriate and timely intervention, and guiding duration of antimicrobial therapy. We present a preliminary report of our experience with 18F-FDG PET/CT in the evaluation of SAB.

Method

All patients with SAB who underwent 18F-FDG PET/CT as part of their evaluation at Mayo Clinic Rochester from January 2010 to January 2017 were included in this retrospective analysis. Demographics, clinical information, laboratory testing, microbiology, echocardiography, and imaging data were collected. Primary outcomes were new findings of metastatic infection on PET/CT with subsequent modification to therapy.

Results

We present the preliminary findings of eleven patients with SAB who underwent PET/CT during the study time period. Patient characteristics are summarized in table 1.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Median duration of symptoms</td>
<td>14 days (IQR 9-37)</td>
</tr>
<tr>
<td>Blood cultures</td>
<td>N=6/11</td>
</tr>
<tr>
<td>Mean peak CRP</td>
<td>176 (SD 121.2)</td>
</tr>
<tr>
<td>Mean peak ESR</td>
<td>83 mm/h (SD 19.1)</td>
</tr>
<tr>
<td>Leukocytosis</td>
<td>9% (N=1/11)</td>
</tr>
<tr>
<td>Median BMI</td>
<td>30 (IQR 28-34)</td>
</tr>
<tr>
<td>Median age</td>
<td>67 years (IQR 59-79)</td>
</tr>
<tr>
<td>Female gender</td>
<td>45% (N=5/11)</td>
</tr>
<tr>
<td>Positive TEE</td>
<td>9% (N=1/11)</td>
</tr>
<tr>
<td>Mean Charlson Comorbidity Index</td>
<td>4.5 (SD 2.9)</td>
</tr>
</tbody>
</table>

Two patients required readmission in our cohort; one had MSSA prosthetic knee joint infection at 60 days from initial presentation, the other was refractory to septic shock and negative blood cultures at 58 days, peased away shortly thereafter.

Discussion

PET/CT demonstrated focal infection in 50% of patients with SAB in this study.

Conclusion

18F-FDG PET/CT is a useful tool for detection of metastatic foci of infection in SAB.

References


Table 1. Summary of patient characteristics

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Figure 1a: Fixed right supraventricular TEE showing right atrial and right ventricular thrombus.

Figure 1b: Coronal spine sagittal FDG PET/CT demonstrating large FDG activity at C6.

Figure 1c: Coronal spine sagittal FDG PET/CT demonstrating large FDG activity at T2.

Figure 2a: Increased focal FDG uptake noted on PET/CT in the right lower neck region.

Figure 2b: Increased focal FDG uptake noted on PET/CT in the right lower neck region.

Figure 3: Increased FODG uptake on PET/CT in the right lower neck region.

Figure 4: Increased focal FDG uptake on PET/CT in the right lower neck region.

Figure 5: Increased focal FDG uptake on PET/CT in the right lower neck region.

Figure 6: Increased focal FDG uptake on PET/CT in the right lower neck region.

Figure 7: Increased focal FDG uptake on PET/CT in the right lower neck region.

Figure 8: Increased focal FDG uptake on PET/CT in the right lower neck region.

Figure 9: Increased focal FDG uptake on PET/CT in the right lower neck region.

Figure 10: Increased focal FDG uptake on PET/CT in the right lower neck region.

Figure 11: Increased focal FDG uptake on PET/CT in the right lower neck region.

Figure 12: Increased focal FDG uptake on PET/CT in the right lower neck region.

Figure 13: Increased focal FDG uptake on PET/CT in the right lower neck region.

Figure 14: Increased focal FDG uptake on PET/CT in the right lower neck region.

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