Introduction

- Patients with end-stage renal disease frequently have immune dysfunction, leaving them more vulnerable to infection than the general population.
- Infections, particularly blood stream infections and pulmonary infections, are leading causes of morbidity and mortality in this population.
- Screening and prevention strategies must be implemented in dialysis clinics to reduce infection risk.
- Screening for latent tuberculosis (LTB) is an important preventative strategy in countries with moderate or high disease burden.
- Among patients with ESRD, interferon-γ release assay (IGRA) positivity is more strongly associated with radiologic evidence of past tuberculosis infection than a tuberculosis skin test.¹

Objective

This continuous quality improvement project was conducted to:
- Ensure that screening of dialysis patients for LTB was being carried out according to relevant policies
- Understand the prevalence of LTB in the patient population
- Identify patient characteristics correlated with increased frequency of LTB
- Prevent active tuberculosis in dialysis patients

Methods

- Charts for 302 adult patients dialyzing at 2 facilities operated by a large dialysis organization in Jeddah, Saudi Arabia were reviewed.
- Information regarding administration of IGRA and the results of interferon-γ release assay (IGRA), as well as demographic, radiological, laboratory data, and any relevant action plans, were recorded.

Results

Identification of Patients with Latent Tuberculosis

- Upon admission to a participating dialysis centers, 302 adult dialysis patients were screened for LTB by IGRA (Figure 1).
- A total of 92 patients (30.5%) were positive.
- Of these, 83 (90.2%) were asymptomatic; 7 (7.6%) had a cough, and 2 (2.2%) had experienced weight loss.
- Patients with a positive IGRA received chest X-rays to rule out active disease.
- 20 patients (21.7%) had abnormal chest X-rays.
- Of those with abnormal chest X-rays, 18 had findings inconsistent with TB.
- The remaining 2 patients were evaluated by a respirologist who thought active TB was unlikely.

Characteristics of Patients with Latent Tuberculosis

- Compared to patients without LTB, patients with LTB (as detected by a positive IGRA) were, on average, older; had a significantly higher ferritin level, were more likely to have a previous history of TB, and less likely to have received the BCG vaccine (Figure 2).
- Other characteristics, including sex, dialysis vintage, history of diabetes or viral hepatitis, and other inflammatory markers were similar across the two groups (Table 2).

Figure 2: Characteristics of Patients with and without LTB

Table 1: Other Characteristics of Patients with and without LTB

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No LTB N=210</th>
<th>LTB N=92</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>48 (±10.5)</td>
<td>55 (±10.5)</td>
<td>0.03</td>
</tr>
<tr>
<td>Sex, male, n (% )</td>
<td>124 (58.5)</td>
<td>44 (48.9)</td>
<td>0.32</td>
</tr>
<tr>
<td>Diabetes</td>
<td>44 (21.4)</td>
<td>43 (46.9)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>History of viral hepatitis</td>
<td>48 (22.8)</td>
<td>30 (32.6)</td>
<td>0.05</td>
</tr>
<tr>
<td>History of TB</td>
<td>57 (27.1)</td>
<td>28 (30.4)</td>
<td>0.50</td>
</tr>
<tr>
<td>History of BCG vaccination</td>
<td>52 (25.2)</td>
<td>39 (42.5)</td>
<td>0.001</td>
</tr>
<tr>
<td>Ferritin (ng/mL, mean ± SD)</td>
<td>64.6 ± 77.0</td>
<td>500 (124)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Figure 1: Identification of Patients with Latent Tuberculosis

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References


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Summary and Conclusions

- The prevalence of LTB in the dialysis units studied was 30.5%.
- Patients with a past history of TB, with no history of BCG vaccination, and those with more advanced age may be more likely to have LTB than patients without these features.
- Although inflammatory markers are not generally high in patients with LTB, our study showed that ferritin is elevated in patients with LTB.
- Screening dialysis patients with unexplained persistently high ferritin levels for LTB should be considered in appropriate settings.