

Latent Tuberculosis in Chronic Dialysis Patients: Prevalence, Risk Factors, and Inflammatory Markers

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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 based on interferon-γ release assay (IGRA)
- Identify patient characteristics correlated with increased frequency of LTB

Methods

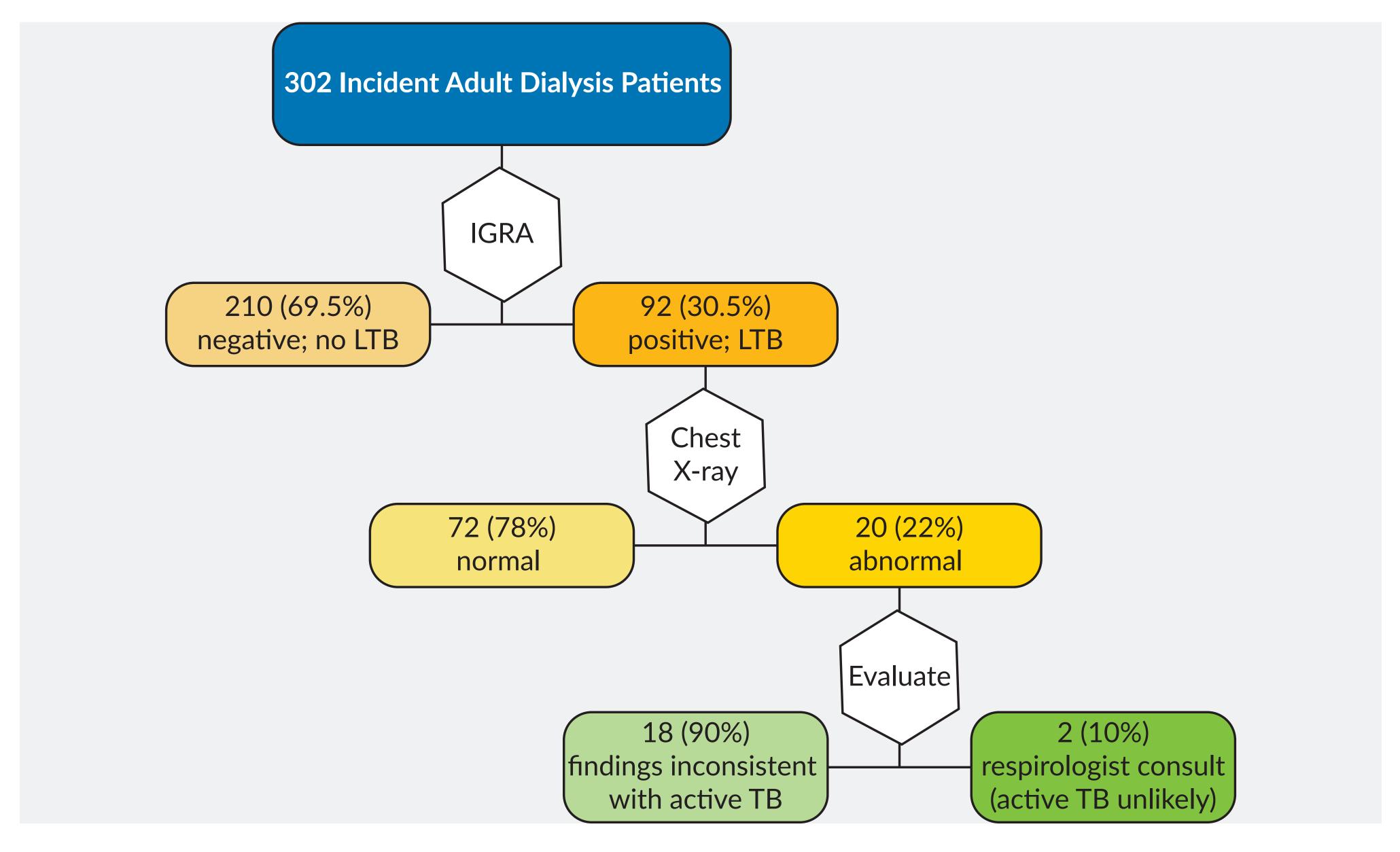
- Charts for 302 adult patients dialyzing at 2 facilities operated by a large dialysis organization in Jeddah, Saudi Arabia were reviewed.
- Information regarding administration of IGRA and the results of administered IGRAs, as well as demographic, radiological, laboratory data, and any relevant action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

Results

Identification of Patients with Latent Tuberculosis

- Upon admission to a participating dialysis centers, 302 adult dialyisis 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.

Figure 1: Identification of Patients with Latent Tuberculosis



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

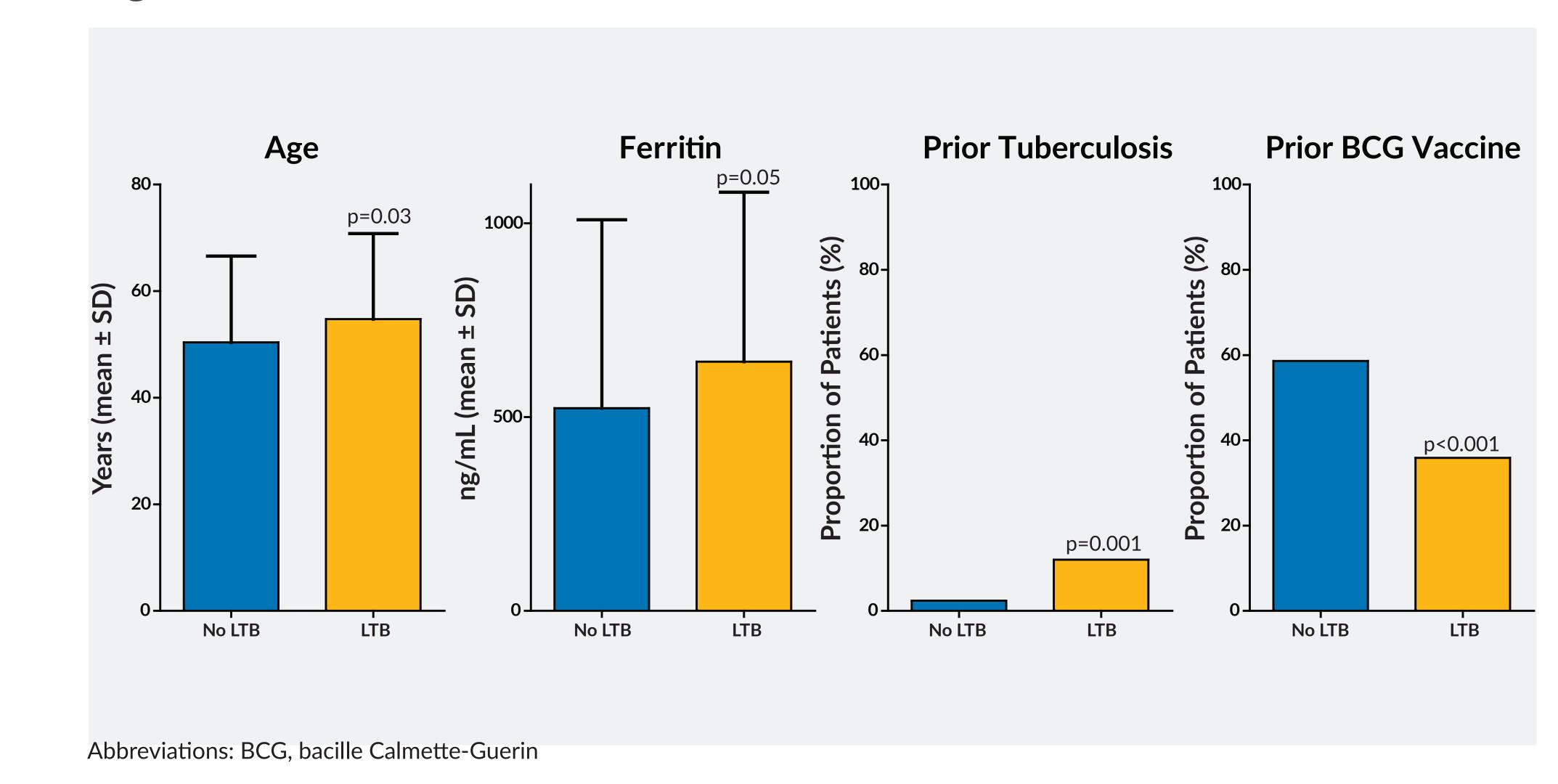


Table 1: Other Characteristics of Patients with and without LTB

	No LTB N=210	LTB N=92	P Value
Sex, male, n%	119 (57)	61 (66)	0.13
Vintage, months, mean ± SD	64.6 ± 77.0	53.2 ± 76.0	0.23
Diabetes, n (%)	85 (40%)	35 (38%)	0.70
HCV , n (%)	30 (14%)	12 (13%)	0.86
HBV , n (%)	8 (4%)	3 (3%)	0.35
Inflammatory markers (mean ± SD)			
Lymphocytes, 10 ⁹ /L	1.69 ± 0.6	1.71 ± 0.7	0.87
Neutrophils, 10 ⁹ /L	3.66 ± 1.7	3.45 ± 1.7	0.33
Platelets, 10 ⁹ /L	228.23 ± 77.1	221.81 ± 72.9	0.50
Neutrophil/Lymphocyte ratio	2.53 ± 2.3	2.41 ± 1.8	0.65
Platelet/Lymphocyte ratio	152.9 ± 96.1	147.8 ± 73.9	0.65
Albumin, g/dL	3.94 ± 0.38	3.86 ± 0.4	0.13
TSAT, %	35.5 ± 15.8	33.0 ± 12.5	0.18

Abbreviations: HBV, hepatitis B virus; HCV, hepatitis C virus; SD, standard deviation

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.

References

1. Rogerson TE, et al. Am J Kid Dis, 2013 Jan;61(1) 33-43.

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