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Diffusing capacity of the lung for carbon monoxide: association with long-term outcomes after lung transplantation in a 20-year longitudinal study

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Shareable abstract (@ERSpublications)
In a cohort spanning 20 years, the D_{LCO} trajectory after lung transplantation is significantly associated with long-term outcomes including chronic lung allograft dysfunction and survival. https://bit.ly/3g3mvCk

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Abstract

Rationale The diffusing capacity of the lung for carbon monoxide corrected for haemoglobin (D_{LCOcor}) measures gas movement across the alveolar–capillary interface. We hypothesised that D_{LCOcor} is a sensitive measure of injurious allograft processes disrupting this interface.

Objectives To determine the prognostic significance of the D_{LCOcor} trajectory on chronic lung allograft dysfunction (CLAD) and survival.

Methods A retrospective analysis was conducted of all bilateral lung transplant recipients at a single centre, between January 1998 and January 2018, with one or more D_{LCOcor} measurements. Low baseline D_{LCOcor} was defined as the failure to achieve a D_{LCOcor} >75% predicted. Drops in D_{LCOcor} were defined as >15% below recent baseline.

Results 1259 out of 1492 lung transplant recipients were included. The median (range) time to peak D_{LCOcor} was 354 (181–737) days and the mean±SD D_{LCOcor} was 80.2±21.2% pred. Multivariable analysis demonstrated that low baseline D_{LCOcor} was significantly associated with death (hazrd ratio (HR) 1.68, 95% CI 1.27–2.20; p<0.001). Low baseline D_{LCOcor} was not independently associated with CLAD after adjustment for low baseline forced expiratory volume in 1 s or forced vital capacity. Any D_{LCOcor} declines ⩾15% were significantly associated with death, independent of concurrent spirometric decline. Lower percentage predicted D_{LCOcor} values at CLAD onset were associated with shorter post-CLAD survival (HR 0.75 per 10%-unit change, p<0.01).

Conclusion Low baseline D_{LCOcor} and post-transplant declines in D_{LCOcor} were significantly associated with survival, independent of spirometric measurements. We propose that D_{LCOcor} testing may allow identification of a subphenotype of baseline and chronic allograft dysfunction not captured by spirometry. There may be benefit in routine monitoring of D_{LCOcor} after lung transplantation to identify patients at risk of poor outcomes.