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**Cardiopulmonary assessment of patients with end-stage kidney disease**

Sir,
The recent investigation by Agarwal highlights the need to consider pulmonary disease as part of the cardiovascular disease spectrum among end-stage renal disease (ESRD) patients. The prevalence of pulmonary hypertension (PHT) was present in 38% of a large ESRD cohort and was associated with poor survival [1]. There are a number of intriguing observations.

The observation that patients with PHT had a greater midwall fractional shortening and cardiac index but had a greater mortality rate is interesting. The correlation between PHT and left atrial diameter strongly suggests a cardiac aetiology to PHT. In the context of an increased left atrial diameter and an associated increase in mortality, the greater midwall fractional shortening and cardiac index are likely to represent greater myocardial workload rather than better myocardial systolic function. It therefore seems plausible that patients with PHT may have reduced cardiopulmonary functional reserve and consequently a greater mortality. A reduced cardiopulmonary functional status is evident in paediatric and adolescent patients with ESRD who have a limited cardiopulmonary capacity just 16 months after starting haemodialysis compared to their counterparts with normal renal function [2]. As the author points out, the similarity in left ventricular mass index suggests that diastolic dysfunction is not a likely explanation of the increased cardiovascular events.

The observation that a lower diastolic blood pressure was associated with mortality is unsurprising. Patients with ESRD are prone to arterial stiffness, which results in a lower diastolic blood pressure. These in turn result in reduced coronary blood flow, compounding any increase in cardiac workload, and may ultimately lead to an increase in cardiovascular mortality [3].

The association between PHT and patients who were on a vitamin D receptor activator may relate to endothelial dysfunction associated with vitamin D deficiency [4, 5]. Prospective studies to investigate the beneficial effect of therapeutic vitamin D supplementation on cardiovascular disease among chronic kidney disease patients are crucial.

The challenge that lies ahead is to identify an integrative approach to cardiac investigations that is most likely to yield a practical approach to the management of an individual patient. Consideration of PHT as part of the cardiovascular disease spectrum among ESRD patients is crucial.

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