The effects of anemia on cardiovascular status

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Left ventricular enlargement is a powerful predictor of cardiac failure and death in endstage renal disease. Regression improves prognosis. We have previously shown, in a long-term prospective cohort of dialysis patients, that sustained anemia is associated with cardiac overload, cardiac enlargement, cardiac failure and death. Recent observational work confirms that this process usually starts early in chronic renal failure, and consistently implicates declining hemoglobin and rising blood pressure levels as being etiological. We recently reported findings on a group of dialysis patients with 4 consecutive annual echocardiograms, following inception of dialysis therapy. Progressive left ventricular dilatation was seen, mostly, but not exclusively, in the first year. Anaemia was clearly associated with this process, mostly in the first year of dialysis therapy: the cardiac enlargement seen after I year was independent of standard risk factors, including haemoglobin levels. These data suggest that earlier treatment of anemia may achieve more than later treatment. Recent randomised trial activity, including ours, intervened relatively late in the anaemia-cardiomyopathy-cardiac failure-death continuum. The United States Normal Hematocrit Trial showed that a policy of later intervention with a normal hematocrit failed to prolong life and led to increased hemodialysis access loss, in patients with symptomatic ischaemic heart disease or cardiac failure. The Canadian Normalization of Hemoglobin Trial, which targeted hemodialysis patients without symptoms of cardiac disease, showed that higher targets failed to regress established left ventricular hypertrophy and dilatation. The higher target hemoglobin level, however, prevented the development of LV dilatation, and was associated with clear quality of life benefits, at no cost in terms of access loss and cardiovascular events. Thus, best evidence suggests that early intervention to avoid low hemoglobin levels improves cardiac outcomes in chronic renal failure patients. Several ongoing trials will soon confirm the benefits and risk of such an approach.