

PHYSICAL FUNCTION IN CHRONIC RENAL FAILURE

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PROBLEM: When compared to general population norms, physical function is suboptimal in end-stage renal disease. However, recent studies indicate that physical function is already impaired prior to the initiation of renal replacement therapy, implying that the initial decline in physical function originates in the chronic renal insufficiency (CRI) phase of the renal disease trajectory. Given the significance of physical function as a clinical outcome, there is a paucity of physical function research in CRI.

PURPOSE: To measure physical function at three distinct phases (based on creatinine clearance – Ccr) of the disease trajectory in CRI: normal renal function with underlying renal disease (Ccr \geq 75 ml/minute), moderate CRI (Ccr 40-60 ml/minute), and advanced CRI (Ccr \leq 30 ml/minute); and to establish if physical function is different between these groups.

DESIGN: Data was collected from 25 patients from each of the Ccr bands, to generate a total patient population of 75. We measured self-reported activities of daily living (Duke Activity Status Index – DASI), self-reported physical activity (Stanford 7-Day Physical Activity Recall Interview – PAR), muscle endurance (sit to stand 60 test – STS60), and laboratory variables (haemoglobin, creatinine, urea, albumin, bicarbonate).

FINDINGS: STS60 was significantly lower in the moderate CRI group when compared to the normal renal function group ($p < 0.05$). This difference occurred without a difference in haemoglobin between these groups. Although the moderate CRI and normal renal function groups did not differ on the basis of the DASI and PAR scores, both the DASI score ($p < 0.001$) and the PAR score ($p < 0.05$) were significantly lower in the advanced CRI group when compared to the moderate CRI group.

CONCLUSION: Physical function is already impaired in moderate CRI, although the perception of diminished functional status occurred at lower levels of renal function. The significant difference in muscle endurance between the moderate CRI and normal renal function groups, in the absence of a concurrent difference in haemoglobin, may substantiate the uraemic myopathy hypothesis, whilst further indicating that myopathy may originate early in renal disease.

RELEVANCE: Rehabilitation efforts need to be initiated early in the course of chronic renal disease. Interventions aimed at increasing and sustaining muscle endurance, if initiated in moderate CRI, have the potential to prevent the decline in functional status as renal function deteriorates.