

Using the Duke Activity Status Index (DASI) to calculate Metabolic equivalence of Task (METs) in haemodialysis patients with chronic kidney disease as an alternative to exercise stress testing.

Miss Amy Joyce¹, Miss Claire Carswell¹, Dr Frank McCarroll², Dr Girish Shivashankar²

¹Queens University Belfast, Belfast, United Kingdom, ²Altnagelvin Hospital, Derry, United Kingdom

Introduction: Functional capacity is a measure that encompasses cardiorespiratory fitness, muscle strength, neuromuscular function, flexibility and balance. Functional capacity plays an essential role in clinically important outcomes of patients with chronic kidney disease including quality of life, morbidity and survival. It also has some predictive value in postoperative outcomes of patients undergoing renal transplantation. The current gold standard for measurement of functional capacity is exercise stress testing to find maximal VO₂ output. This method is expensive, time consuming and not practical for all patients and is therefore not routinely carried out in clinical practice. The Duke Activity Status Index (DASI) is an alternative to exercise testing, where a short questionnaire is taken and Metabolic Equivalence of Tasks are calculated. It has several potential uses including assessing potential consideration for transplantation vs dialysis, monitoring functional capacity over time, screening for low functioning patients that may require support, incentivizing patients and units to improve physical activity as well as increasing awareness of the importance of functional capacity on outcomes. We administered the DASI questionnaire on 53 patients on hemodialysis in a Northern Ireland Renal Unit with the aim of assessing functional capacity of those considered and not considered for transplantation. We also aimed to assess whether the use of DASI was a practical alternative to exercise testing that could be incorporated into clinical practice.

Methods: We interviewed 53 patients using the DASI questionnaire while they attended the unit for haemodialysis. Scores were tallied and compared against age and sex as well as primary renal diagnosis and time since start of dialysis.

Results: The average MET for the entire unit was 5.44mlkg⁻¹min⁻¹. We found that METs decreased with age. The average MET in females was lower than males (4.94 vs 5.71 mlkg⁻¹min⁻¹). However, female average age was almost 10 years older than males (67.1 vs. 58.3 years). The trendline for METS fell from 5.81 to 4.61 mlkg⁻¹min⁻¹ when compared with time on dialysis ranging from 0 days to 4000 days. Patients were categorised based on their primary renal diagnosis and average METs for each group was compared. Those with chronic pyelonephritis averaged the lowest scores of 4.17mlkg⁻¹min⁻¹, while those with hypertensive renal disease scored highest with 7.9 mlkg⁻¹min⁻¹.

Discussion: From this process, we concluded that DASI alone cannot form the decision for transplant consideration, however it can be a valuable tool when used as part of the greater clinical picture. It is a relatively subjective form of assessment and therefore we suggest its use may be more appropriate for monitoring changes over time, where realistic individualized targets can be set and measured every 6 months. In previous studies using self-assessment, significant discrepancies have been found between presumed functional capacity by a clinician and a patient's self assessment. Therefore, carrying out the DASI questionnaire in renal units may highlight these differences and impact treatment plan, patient outcome and overall motivation to improve functional capacity.