

Title of the Internship: Assessment of fatigue in Hemodialysis patients and evaluation of the impact of physical activity on fatigue and quality of life

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Project description including a short introduction, aim/objectives and methods/approach to be used

Fatigue is one of the most prevalent and burdensome symptoms experienced by patients undergoing maintenance hemodialysis. Studies have reported that between 60% and 95% of dialysis patients suffer from moderate to severe fatigue, which negatively affects physical functioning, psychological well-being, social participation, and overall quality of life [1,2]. Fatigue has also been associated with increased hospitalization rates, reduced treatment adherence, and higher mortality risk [3].

The etiology of fatigue in hemodialysis patients is multifactorial and may involve anemia, chronic inflammation, uremia, sleep disturbances, depression, malnutrition, and reduced physical activity levels [4]. Physical inactivity is particularly common in this population, with many patients exhibiting markedly lower activity levels than healthy individuals of similar age [5]. This sedentary lifestyle may contribute to muscle wasting, reduced cardiorespiratory fitness, and worsening fatigue, creating a vicious cycle of physical deconditioning and symptom burden [6].

However, fatigue remains insufficiently assessed in routine clinical practice, and the relationship between fatigue severity and physical activity levels is not fully understood. A better understanding of this relationship may help identify effective non-pharmacological interventions to improve patient outcomes. We would like to describe baseline in-depth characteristics of fatigability and activity levels and/or sedentary behaviour in our hemodialysis cohort before developing a structured physical activity program.

The objective of this study is to assess the fatigability in patients undergoing maintenance hemodialysis. The primary outcome will be the physical activity and sedentary behaviour measured by an actigraphy device. Secondary outcomes will assess other fatigability parameters: 1) Handgrip protocol 2) questionnaires 3) the knee extensor strength 4) quadriceps thickness by US measurement 5) Heart Rate Variability 6) Root Mean Square of Successive Differences 7) 6-minute walk test 8) 1-Minute Sit-to-Stand Test. In a subgroup of patients we will assess through a 31PMRS the Phosphocreatinine recovery to assess the ability to repeat physical efforts and the energetic consumption by ATP/PCr measurement during exercise.

The results of this study will enable the development of a structured physical activity programme, comprising aerobic and strength training exercises carried out during dialysis sessions over a 12-week period.

References :

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