ABSTRACT FOR THE GENERAL PUBLIC

Pathological processes associated with ageing increase the risk of cognitive deficits and dementia. Frailty syndrome may significantly accelerate these pathological processes in the elderly population. Frailty syndrome, also known as weakness or reserve depletion syndrome, is characterized by decreased physiological function and neuropsychiatric symptoms, including cognitive decline and depressive states. In people with cardiovascular disease, among other heart failure, the risk of frailty is three times higher. Cardiovascular risk factors have been shown to be more prevalent in people diagnosed with frailty syndrome. Further, frailty syndrome is particularly observed in severe heart failure, which increases the risk of mortality, increases hospital readmission, and reduces patients' quality of life. In addition, co-occurrence of cognitive impairment and frailty syndrome significantly increases the risk of dementia in the heart failure population.

The main research objective of this project is to understand better the association between frailty syndrome and co-occurring cognitive decline and the impact each has on the development of dementia and mild cognitive impairment in patients with heart failure. In the first research task, we will analyze the risk factors associated with the development of heart failure in the elderly. We will investigate the correlation between the occurrence of frailty syndrome and the deterioration of cognitive processes in people with heart failure. The second objective will be to examine a group of patients with heart failure in order to identify problems of a mental nature due to chronic disease (heart failure) and the emergence of a syndrome of frailty, manifested by cognitive impairment over time. This research will include an analysis of depressive and anxiety disorders, as they are considered potential risk factors for cognitive impairment in the population with cardiovascular problems and frailty syndrome. The last research aim will be to analyze the relationship between mild cognitive impairment and self-care behaviours and adherence to therapeutic recommendations. In this way, the results of our research will allow us to modify and optimize interventions and the principles of care for patients with heart failure in the elderly, with particular attention to the weakening of cognitive processes.

To achieve these research goals, we will perform physiological/clinical measures of frailty and psychological assessments in patients over the age of 60 with a diagnosis of heart failure. Psychological measurements will be based on self-descriptive questionnaires measuring the level of depression and anxiety symptoms. A clinical frailty scale will be used to assess the physical frailty to identify the frailty phenotype. A walking speed test and a dynamometric measurement of handgrip strength also will be performed. Specific cognitive abilities will be assessed using a series of paper-pencil neuropsychological tasks. Of particular interest to us are the cardiovascular factors contributing to cognitive decline in specific cognitive domains, including executive function, working memory and attention. For example, deficits in executive functions, defined as the ability to program and control their own actions, are prevalent in the population with heart failure. Impairment of executive functions in patients with heart failure significantly impedes the implementation of daily tasks, interferes with self-care and increases dependence on others. Another important cognitive domain that can be impaired in heart failure is attention. Attention allows a person to maintain for a certain time the concentration on a given task and facilitates memory processes. Deterioration of attention may result in a subjective feeling of memory impairment in patients, which is considered an important predictor of the onset of dementia in the elderly.

The development of frailty and cognitive impairment in cardiovascular disease is particularly important, because cardiovascular diseases are one of the most common causes of both morbidity and mortality in Poland and the world. The prevalence of overlapping frailty and cognitive impairment in patients with heart failure therefore necessitates a routine assessment of these components in the care of patients with cardiovascular disease. The findings of this project will support the development of interventions designed to improve outcomes, including reducing readmissions, reducing mortality, improving self-care and improving adherence to therapeutic recommendations in patients with heart failure. Moreover, the results of this study will help to fill the existing gap in the world literature related to the identification of cardiovascular factors that contribute to cognitive impairment, including deficits in executive function or attention, in patients with a diagnosis of heart failure and frailty syndrome.