

ADAM10 as a Potential Blood Biomarker of Cognitive Frailty

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Abstract : Introduction: Considering the increase in life expectancy of world population, there is an emerging concern in health services to allocate better care and care to elderly, through promotion, prevention and treatment of health. It has been observed that frailty syndrome is prevalent in elderly people worldwide and this complex and heterogeneous clinical syndrome consist of the presence of physical frailty associated with cognitive dysfunction, though in absence of dementia. This can be characterized by exhaustion, unintentional weight loss, decreased walking speed, weakness and low level of physical activity, in addition, each of these symptoms may be a predictor of adverse outcomes such as hospitalization, falls, functional decline, institutionalization, and death. Cognitive frailty is a recent concept in literature, which is defined as the presence of physical frailty associated with mild cognitive impairment (MCI) however in absence of dementia. This new concept has been considered as a subtype of frailty, which along with aging process and its interaction with physical frailty, accelerates functional declines and can result in poor quality of life of the elderly. MCI represents a risk factor for Alzheimer's disease (AD) in view of high conversion rate for this disease. Comorbidities and physical frailty are frequently found in AD patients and are closely related to heterogeneity and clinical manifestations of the disease. The decreased platelets ADAM10 levels in AD patients, compared to cognitively healthy subjects, matched by sex, age and education. Objective: Based on these previous results, this study aims to evaluate whether ADAM10 platelet levels of could act as a biomarker of cognitive frailty. Methods: The study was approved by Ethics Committee of Federal University of São Carlos (UFSCar) and conducted in the municipality of São Carlos, headquarters of Federal University of São Carlos (UFSCar). Biological samples of subjects were collected, analyzed and then stored in a biorepository. ADAM10 platelet levels were analyzed by western blotting technique in subjects with MCI and compared to subjects without cognitive impairment, both with and without presence of frailty. Statistical tests of association, regression and diagnostic accuracy were performed. Results: The results have shown that ADAM10/ β -actin ratio is decreased in elderly individuals with cognitive frailty compared to non-frail and cognitively healthy controls. Previous studies performed by this research group, already mentioned above, demonstrated that this reduction is still higher in AD patients. Therefore, the ADAM10/ β -actin ratio appears to be a potential biomarker for cognitive frailty. The results bring important contributions to an accurate diagnosis of cognitive frailty from the perspective of ADAM10 as a biomarker for this condition, however, more experiments are being conducted, using a high number of subjects, and will help to understand the role of ADAM10 as biomarker of cognitive frailty and contribute to the implementation of tools that work in the diagnosis of cognitive frailty. Such tools can be used in public policies for the diagnosis of cognitive frailty in the elderly, resulting in a more adequate planning for health teams and better quality of life for the elderly.

Keywords : ADAM10, biomarkers, cognitive frailty, elderly

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