

DYNAMIC STRENGTH ASSESSMENT IN AN OLDER-OLD FRAIL POPULATION: TO A CLINICAL TOOL DEVELOPMENT

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Keywords: Dynamic strength, frailty, functional status, gait, 30-s chair stand test

Summary: Physical frailty in later life is costly in terms of both money spent on medical care and the diminished quality of life of the patient and their relatives [1]. Early detection of weakness and proper adjustments in physical activity behaviors make it possible to prevent the frailty syndrome [2]. A decline in lower body function has been identified as a major predictor of subsequent disability [3]. Therefore, measures lower body strength and endurance are the keys to assess older adults' physical performance. In clinical practice, functional tests (i.e. strength, gait and 30-s chair stand test "30-s CST") are used but based on time or number of repetitions. However, latest advances of technology have demonstrated that inertial units are able to provide major information related to how the movements are performed [4].

In this paper, the relationship between maximal dynamic strength, measured with a leg press machine, was compared to both clinically-used and kinematic parameters of gait and the 30-s CST through the use of a single inertial sensor. A group of seven frail oldest-old was tested to assess their physical status. The idea here is to develop a tool that could be suitable in the clinical practice to help to identify the most relevant physical outcomes to prevent disability. Our results show that values of dynamic strength are significantly associated with chair-kinematics (i.e. sit-to-stand "SiSt" duration, power values during the SiSt and stand-to-sit "StSi" transfers). In particular, R-values ranges from 0,82 for the max. power during SiSt and -0,76 for the SiSt duration, $p < 0.05$. On the other hand, normally used parameters such as the time required to perform the 5-m gait test, and the number of repetitions in the 30-s CST not present associations with maximal dynamic strength.

As a conclusion, the use of inertial units can provide a tool to assess dynamic strength in clinical settings in an easy and affordable manner. This may lead to an important help tool to clinicians and physiotherapist to undergo the corresponding actions to promote independent living in later years of life.