Abstract Group: 9.1. Respiratory Function Technologists/Scientists

Keyword 1: COPD - diagnosis Keyword 2: Extrapulmonary impact Keyword 3: Peripheral muscle

Title: Clinical impact of the relationship between low bone mineral density and peripheral muscle strength in patients with COPD

Mr. Glenn 27960 Leemans glenn.leemans@ua.ac.be 1,2,3, Mr. Kris M.H. 27961 Ides Kris.ides@artesis.be 2,3, Dr. Lieve 27962 De Backer Lieve.debacker@ua.ac.be MD 2, Mr. Hilde 27963 Vaerenberg hilde.vaerenberg@ua.ac.be 2, Mr. Kevin 27964 De Soomer kevin.desoomer@uza.be 2, Dr. Dirk 27976 Vissers dirk.vissers@artesis.be 1,3 and Prof. Dr Wilfried 27981 De Backer wilfried.debacker@ua.ac.be MD 1,2. 1 Faculty of Medicine and Health Sciences, University of Antwerp, Wilrijk, Antwerp, Belgium, 2610 ; 2 Respiratory Medicine, University Hospital Antwerp, Edegem, Antwerp, Belgium, 2650 and 3 Department of Health Sciences, Artesis University College Antwerp, Merksem, Antwerp, Belgium, 2170.

Body: Introduction COPD is a respiratory disease with systemic consequences such as osteoporosis. It is known that this impaired bone mineral density (BMD) correlates with physical inactivity. If physical inactivity does depend on muscle strength, a correlation between muscle strength and osteoporosis must exist. Objective To evaluate how strong peripheral muscle strength is related to the loss of BMD in our COPD population. Methods Data of 11 patients in a pulmonary rehabilitation program is analysed. BMD at the lumbar spine and hip is determined by dual-energy X-ray absorption (DXA). DXA is performed based upon the patient's risk profile (long history of corticosteroids). The BMD is expressed as a T score. Isometric quadriceps force (IQF) is assessed by a computerized dynamometer during a voluntary maximal isometric contraction with the hip at 90° and the knee at 60° flexion. The highest value is taken. Results A significant correlation is found between T score lumbar spine and IQF in % predicted of the normal value (R=0.627; p=0.039). IQF is not related to the T score of the hip (p=0.385).

Conclusions Lower BMD in the lumbar spine seems to relate with lower IQF in our COPD population. Strengthening of those quadriceps muscles in this specific COPD patients must therefore best be done in an upright, weight-bearing position during closed chain exercises to stabilise or increase the BMD of the lumbar spine.