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Title: The timed up and go test and quadriceps strength in COPD

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Body: Background The Timed Up and Go (TUG) test is a simple and rapid measure of submaximal physical activity in elderly. In COPD, the TUG is prolonged and it relates to the six-minute walk distance (6MWD), which reflects similar impairment in the elderly. We hypothesised that the TUG would relate to quadriceps muscle strength. Methods In 190 patients COPD, isometric quadriceps maximum voluntary contraction (QMVC), 6MWD, the COPD assessment test (CAT), spirometry and the TUG were determined. Results Patients (97 males) mean age 67±7 years and FEV_1% predicted 57±15. The QMVC, TUG and 6MWD were related to FEV_1% predicted, $p<0.01$. The TUG related to the 6MWD, r=-0.71, and both were associated with the QMVC (r=-0.28, and r=0.39, respectively), $p<0.001$ (Figure1). The CAT related to the TUG, r=0.36, 6MWD, r=-0.48 and QMVC, r=-0.26, all $p<0.001$. Stepwise regression analysis adjusted for age, BMI and sex showed the 6MWD and TUG similarly predicted the variability in QMVC, 54% and 51%, respectively. Conclusion The TUG test, an integrated measure of strength, balance and function, was closely associated to the 6MWD, was related similarly to the CAT score and predicted quadriceps muscle strength. These parallels between the 6MWD and TUG with its rapid and simple performance suggests the TUG test could be used in both research and clinical settings to assess the impact of COPD on exercise performance.