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Title: Effects of BMI changes on lung function in COPD subjects from two longitudinal general population studies

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Body: Background. Longitudinal studies have shown that increases in BMI can lead to a reduction in pulmonary function, and the nature of this association remains under investigation in COPD. Aim. To evaluate the effects of BMI changes over an 8.2-17.5 year follow-up on, FEV1and FVC in COPD subjects from a longitudinal general population study. Methods. Subjects (n = 1472, >24years of age) participating in both baseline and follow-up survey from two different longitudinal general population studies in Italy (Po river delta and Pisa) were investigated. COPD subjects (n=230) were defined those with FEV1/FVC<0.70 at baseline. Longitudinal changes (Δ) in BMI, FVC, and FEV1 were computed as absolute differences between the values at follow-up and those at baseline. Linear regression models for ΔFEV1, ΔFVC, and with ΔBMI, gender, baseline age, baseline smoking habits, and baseline BMI as covariates were applied. Results. ΔBMI varied from -3.91 to 8.65 kg/m^2 in subjects with COPD, and from -12.76 to 14.54 kg/m^2 in subjects without COPD. In COPD subjects, longitudinal changes in BMI were significantly associated with reduction in lung function parameters. Estimated coefficients of ΔBMI were -0.142, p = 0.024, and -0.184, p = 0.004, for ΔFEV1 and ΔFVC, respectively. These associations were independent from gender, baseline smoking habit and baseline BMI, while were affected by baseline age. Analogous results were observed in subjects without COPD. Conclusions. Longitudinal BMI changes affect lung function in subjects with and without COPD. On average an accelerated decline of lung function is observed in those COPD subjects with higher increase of BMI over follow-up.