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Title: The bronchitic phenotype is related to morbidity and mortality - report from the OLIN COPD study

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Body: Background: The bronchitic phenotype in COPD may be related to a worse general health status and exacerbations. It is probably under-diagnosed and there is a lack of knowledge about the impact of long term outcome. Aim. To estimate the prevalence of bronchitic phenotype in COPD and the relation to respiratory events (RE) and mortality in a population based study. Method: In 2002-04 subjects from four population based cohorts within the OLIN-studies were invited to a re-examination. From the participants all subjects with COPD according to the GOLD spirometric criteria, $FEV_1/FVC<0.7$, were identified (n=993) together with gender- and age matched subjects without COPD (n=993). The COPD cohort and the control sample have been invited to yearly examinations since 2005. Baseline characteristics were used to identify subjects with chronic productive cough (CPC). Mortality data were collected until the end of 2011. Results: CPC and RE during the last 12 months were more common in COPD compared to in non-COPD (42.8 vs. 23.5 %, $p<0.001$ and 21.0 vs. 9.1 %, $p<0.001$). Subjects with CPC had higher mortality compared to those without, in both COPD (29.2 vs. 18.8, $p<0.001$) and non-COPD (23.2 vs. 15.9, $p=0.011$). The risk for RE was higher in non-COPD with CPC, COPD without CPC and COPD with CPC compared to in non-COPD without CPC also when adjusted for gender, age, smoking status and heart disease (OR 4.21, 95%CI 2.67-6.64, OR 2.86, 95%CI 1.93-4.24 and OR 9.23, 95%CI 6.22-13.7). COPD with CPC was a significant risk factor for death (OR 1.45, 95% CI 1.02-2.05) in a similar model. Conclusion: The bronchitic phenotype is related to increased morbidity and mortality in COPD.