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Title: The relationship between NT proBNP and CT lung density in long term smokers

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Body: Introduction: Cardiovascular conditions are reported to be the most frequent cause of death in COPD. Aims and objectives: The relationship between N-terminal prohormone of brain natriuretic peptide (NT proBNP) as a surrogate marker of congestive heart failure (CHF) and CT lung density remains unclear. Pulmonary oedema leads to increased CT lung density. Little is known about milder CHF and CT lung density. Lung cancer screening provides an opportunity to study this relationship. Methods: 500 long-term smokers were selected from the Danish Lung Cancer Screening Trial (DLCST). Smoking habits were recorded and spirometry was performed. CT lung density was measured automatically by in-house developed computer software and expressed as the volume adjusted 15th percentile density (PD15). NT proBNP was measured as part of a panel of biomarkers. The 194 persons, who had the CT scan and the blood sample performed the exact same day, were included in a multiple regression model. The model included gender, pack years, number of cigarettes a day during the last month, COPD severity, and NT proBNP with PD15 as outcome variable. Results: Female sex (+20.5g/l, SE 1.9, p< 0.001), high number of cigarettes a day (+0.6 g/l, SE 1.1, p< 0.001) and no or mild COPD (+0.2, SE 0.1, p<0.001) were associated with a higher PD15, but there was no correlation with NT proBNP (+0.0001, SE 0.002, p=0.959). Conclusions: PD15 was not correlated to NT proBNP. Therefore milder degrees of CHF seem to have little influence on CT lung density. Lung density is higher in females, in people without COPD and in heavy current smokers.