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LETTER TO THE EDITOR

Reply to Hochheggar et al.

Dear Editor,

We like to thank dr Hochhegger and colleagues for their important comment on our paper ''Distribution of emphysema in heavy smokers: Impact on pulmonary function''. They highlight an important issue in automated quantification of emphysema, which cannot easily be solved. While the first studies comparing the extent of low attenuation areas to the extent of emphysema used high dose CT scans[1,2] current studies investigating emphysema with CT scans often use low dose protocols[3,4] because of the intrinsic risk of applied radiation.[5] Yuan et al. have shown that using a low-dose protocol results in increased emphysema scores, caused by increased noise levels, which should be corrected for.[6] Therefore, we applied a noise filter before quantifying the extent of low attenuation areas.[7] Schilham et al. have previously shown that applying such a noise reduction filter results in emphysema scores that are comparable to emphysema scores obtained from high dose CT scans performed in the same session.[7] We agree with Dr Hochhegger et al. that application of such a noise reduction filter can only reduce the problem, but won't solve the issue completely. Therefore, we would like to state that automated quantification of low attenuation areas on CT is not suitable to detect emphysema on an individual basis, but it can be used to detect progression of disease as long as all parameters are kept constant.[8] However, we believe that in a large cohort, automated quantification can be used to investigate associations, as is done in this investigation.

We have shown that distribution of CT emphysema has a small and therefore probably a clinical irrelevant impact on spirometry results; an effect, which was independent of the applied density threshold. Therefore, it is unlikely that the increased noise levels in the CT scans of our population had have impact on the observed trends.

Although it has been recommended previously to use at least 200 mA for automated quantification of emphysema, we believe that the dose issue and intrinsic risk on radiation-induced cancer is too important. Therefore, we like to advocate using a low dose protocol in combination with a noise reduction filter for automated quantification of emphysema instead of high dose protocol.

Conflict of interest

The authors have no conflict to declare.

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