Severity of breathing disorder during sleep is not correlated with idiopathic pulmonary fibrosis: a systematic review and meta-analysis

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Dear Editor,

We read an article written by Lee et al\textsuperscript{1} with interest. The authors found that gas exchange and oxygenation during sleep in patients with idiopathic pulmonary fibrosis (IPF) is worse than during exercise. The authors also mentioned that the findings from their study were consistent with other reports that IPF may associate with sleep disorder. However, there is still controversy regarding association between sleep-disordered breathing (SDB) and IPF. We completed a systematic review and meta-analysis of published observational studies assessing SDB and IPF. Reviews, case reports, letters, commentaries, abstracts and unpublished studies were excluded. SDB was diagnosed by having polysomnography measured.

We performed a systematic search from the Cochrane Central Register of Controlled Trials, PubMed/MEDLINE and EMBASE databases until June 2015. We used a random-effect model in the meta-analysis using Comprehensive Meta-Analysis Software version 3.0. We estimated the pooled correlation between apnea-hypopnea index (AHI) and parameters in pulmonary function test including total lung capacity (TLC), force vital capacity (FVC), force expiratory volume in 1 S (FEV\textsubscript{1}) and FEV\textsubscript{1} to FVC ratio. AHI $\geq$ 5 represents a diagnosis of SDB.

A total of 10 articles underwent full-length review. Data from three cross-sectional studies\textsuperscript{2–4} were extracted and included in the meta-analysis. The pooled correlation between AHI and TLC was $-0.19$ (95\% confidence interval [CI]: $-0.53$ to $0.21$, \(P = 0.36\)). The pooled correlation between AHI and FVC was $-0.21$ (95\% CI: $-0.45$ to $0.12$, \(P = 0.21\)). We did not perform a meta-analysis for the FEV\textsubscript{1} and FEV\textsubscript{1} to FVC ratio outcomes because of too few included studies.

Although previous studies demonstrated that SBD was associated with IPF, our analysis did not find a significant correlation of these two conditions. This may be explained by a mechanism of restrictive lung disease that is independent of severity of SBD.

A major limitation of our study was the small number of studies that met our inclusion criteria. Another limitation is that the results analysed were from observational studies, which might be confounded by unadjusted factors such as age, gender, BMI, medication and comorbidities, all of which might affect the pulmonary function parameters.

In conclusion, the association between sleep breathing disorder and pulmonary fibrosis is still questionable. Further prospective studies with adjusted effects for age, sex or BMI are needed to accurately investigate the relationship between these two conditions.

Conflict of interest: None declared.

\textbf{References}