From pre-COPD to COPD: a Simple, Low cost and easy to IMplement (SLIM) risk calculator

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Shareable abstract (@ERSpublications)
In middle-aged ever-smokers, a simple predictive model, with FEV_1/FVC, smoking history, BMI and chronic bronchitis, helps identify subjects at high risk of developing chronic airflow limitation
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Abstract

Background The lifetime risk of developing clinical COPD among smokers ranges from 13% to 22%. Identifying at-risk individuals who will develop overt disease in a reasonable timeframe may allow for early intervention. We hypothesised that readily available clinical and physiological variables could help identify ever-smokers at higher risk of developing chronic airflow limitation (CAL).

Methods Among 2273 Lovelace Smokers' Cohort (LSC) participants, we included 677 (mean age 54 years) with normal spirometry at baseline and a minimum of three spirometries, each 1 year apart. Repeated spirometric measurements were used to determine incident CAL. Using logistic regression, demographics, anthropometrics, smoking history, modified Medical Research Council dyspnoea scale, St George's Respiratory Questionnaire, comorbidities and spirometry, we related variables obtained at baseline to incident CAL as defined by the Global Initiative for Chronic Obstructive Lung Disease and lower limit of normal criteria. The predictive model derived from the LSC was validated in subjects from the COPDGene study.

Results Over 6.3 years, the incidence of CAL was 26 cases per 1000 person-years. The strongest independent predictors were forced expiratory volume in 1 s (FEV_1)/forced vital capacity (FVC) <0.75, having smoked ⩾30 pack-years, body mass index (BMI) ⩽25 kg·m^2 and symptoms of chronic bronchitis. Having all four predictors increased the risk of developing CAL over 6 years to 85% (area under the receiver operating characteristic curve (AUC ROC) 0.84, 95% CI 0.81–0.89). The prediction model showed similar results when applied to subjects in the COPDGene study with a follow-up period of 10 years (AUC ROC 0.77, 95% CI 0.72–0.81).

Conclusion In middle-aged ever-smokers, a simple predictive model with FEV_1/FVC, smoking history, BMI and chronic bronchitis helps identify subjects at high risk of developing CAL.