

Clinical reviews

Our panel of GPs review recent research papers in their specialist areas that may influence the way you practise

Reviewers

Addiction

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Cardiovascular disease

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Diabetes

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Mental health

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Obstetrics and gynaecology

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Paediatrics

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Respiratory disease

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Sexual health

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Smoking cessation

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Urology

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Respiratory disease

Smoking duration the best indicator of COPD progression

The number of years that an individual has been smoking is closely linked to the degree of structural lung disease, airflow obstruction and functional outcomes in chronic obstructive pulmonary disease (COPD). It is a better measure than pack-years or the number of cigarettes smoked per day, a large study from the USA has shown.

Cross-sectional data from a multicentre cohort (COOPDgene) of current and former smokers were analysed. Those with other lung diseases, apart from asthma, were excluded. The age at which participants started smoking, length of time they had been smokers and average number of cigarettes smoked a day were recorded. Smoking burden was also assessed by pack-years.

The primary outcome was airflow obstruction (FEV_1/FVC). Secondary outcomes included: CT emphysema, CT gas trapping, functional capacity measured by the 6-minute walk distance (6MWD), and respiratory morbidity by the St George's Respiratory Questionnaire (SGRQ). COPD was assessed by spirometric and imaging metrics, and disease

burden quantified using respiratory quality of life and functional capacity measurements.

A total of 10,187 subjects were included in the study, mean age 59.6 years. Around half, (53.5%) were male and a third (33.4%) were African American. There were slightly more current than former smokers (53.2% vs 46.8%). The mean pack-years of smoking was 44.2, duration of smoking 36.4 years, and number of cigarettes smoked/day 24.3.

Adjustments were made for age, race, sex, BMI, CT scanner, centre, age of smoking onset and current smoking status.

For degree of airflow obstruction (FEV_1/FVC), the adjusted effect size was greater for smoking duration than for cigarettes/day and pack-years ($P < 0.001$). Likewise, for CT emphysema, the adjusted effect size was greater for smoking duration than for number of cigarettes/day and pack-years, and these results were mirrored for gas trapping.

Using the SGRQ, the effect size was also greater for smoking duration than for number of cigarettes/day and pack-years, with similar results for the 6MWD.

In helping to determine degree of risk smoking burden is frequently measured in pack-years, a product of the average number of packs of cigarettes smoked a day and smoking duration in years. However, the exposure time-risk profile for some diseases with a clear onset of disease has been delineated. For example, lung cancer is associated more strongly with the duration of smoking than with the average number of cigarettes per day.

The authors conclude: 'Smoking duration alone is more strongly associated with estimates of COPD disease components than cigarettes smoked per day, and the composite index of pack-years. Although the number of cigarettes per day is also associated with COPD, using

pack-years as measured currently may lower the strength of association between cigarette smoking and COPD metrics in epidemiological studies.'

As in other diseases such as lung and oesophageal cancer, the duration of smoking is the most influential factor in COPD.

The authors speculate that a longer duration of smoking is associated with increasing accumulation of genetic and epigenetic changes. There may also be alterations in the lung microbiome leading to lesser microbial diversity over time with continued cigarette smoke exposure.

For GPs, although this study offers little new on the implications for the development of COPD in smokers, what it does suggest is a new more convenient and more accurate method of quantifying the risk.

DR PETER SAUL

Bhatt SP, Kim Y, Harrington KF et al. Smoking duration alone provides stronger risk estimates of chronic obstructive pulmonary disease than pack-years. Thorax 2018;73:414-21

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