

## LETTERS

## Obesity in patients with COPD, an undervalued problem?

Franssen *et al* reported potential links between obesity and chronic obstructive pulmonary disease (COPD).<sup>1</sup> In their review, the authors use obesity prevalence estimates for COPD patient populations from only two studies with a relatively small sample sizes.<sup>2,3</sup> Therefore, in our view, whether or not obesity is actually more prevalent in patients with COPD is still a matter of debate. Moreover, the current evidence of a possible association between obesity and a worse COPD disease state is inconclusive. This information is crucial before considering any potential underlying mechanisms of this presumed association.

In order to contribute to the discussion on the role of obesity in COPD, we analysed data from a Dutch regional primary care diagnostic centre to address these questions. The procedures and database have been described elsewhere.<sup>4</sup> In short, our database contains spirometry tests of patients referred by general practitioners. Also information on body mass index (BMI), smoking habits, exacerbation rate and level of dyspnoea (Medical Research Council (MRC) score) are collected during all visits.<sup>4</sup> For the current analysis, we used information from the most recent spirometric tests from all current and former smokers with respiratory symptoms aged >40 years and a post-bronchodilator forced expiratory volume in 1 s (FEV<sub>1</sub>)/forced vital capacity (FVC) of <0.70. BMI (kg/m<sup>2</sup>) was categorised as low weight (BMI ≤21), normal weight (21 < BMI <25), overweight (25 ≤ BMI <30) and obesity (BMI ≥30). Obese patients were

compared with normal and overweight patients in terms of postbronchodilator FEV<sub>1</sub>% predicted, FVC and MRC scores. The associations between obesity and these outcomes were analysed with linear regression and ordinal regression. The models were corrected for age, gender and current smoking habit.

Table 1 shows the characteristics of the study population (n = 1761) by BMI category. Overall, 15.1% of the study subjects were obese. FVC was 250 ml lower in obese patients compared with patients with normal weight and overweight (p < 0.01). We found no association between obesity and post-FEV<sub>1</sub>% predicted, but obesity was associated with higher MRC scores (odds ratio (OR) 2.05, 95% CI 1.67 to 2.52).

The prevalence of obesity in our population was lower compared with the study by Steuten *et al* (ie, 18%), but still slightly higher compared with the general Dutch population aged ≥45.<sup>5</sup> Only the FVC was reduced in the obese COPD patients. This is an important observation, as this could result in under-representation of COPD in obese individuals when the main GOLD (Global Initiative for Chronic Obstructive Lung Disease) criterion (ie, FEV<sub>1</sub>/FVC < 0.70) is applied to demonstrate airflow obstruction.

Although our findings indicate that the prevalence of obesity in patients with COPD is only slightly higher compared with that of the general population, obesity is a prevalent problem in patients with COPD associated with a higher level of dyspnoea. Therefore, we ask for more attention to be paid to obesity in patients with COPD, in both research and patient care. Our efforts should focus not only on research into potential links between obesity and COPD, but also

on effective ways to prevent and treat obesity in COPD patients, which may require a different approach from that in healthy subjects.

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## Authors' reply

We welcome the comments of van den Bemt *et al* regarding our review on obesity and chronic obstructive pulmonary disease (COPD). Their careful analysis of a large Dutch primary care population of COPD provides further evidence for an increased prevalence of obesity in patients with early-stage COPD. According to their data, about 17% of the patients in GOLD (Global Initiative for Chronic Obstructive Lung Disease) stage II are obese vs 11% in a healthy Dutch population.<sup>1</sup> The prevalence of a body mass index (BMI) ≥30 kg/m<sup>2</sup> was significantly lower in GOLD III (14%) and substantially reduced in GOLD IV patients (2%). The results of van den Bemt *et al* furthermore show that obesity is clinically important in COPD patients, since it is related to increased dyspnoea. Although the association between BMI and breathlessness is not unique for patients with COPD,<sup>2</sup> it indicates that the abundance of fat mass is a factor that should be taken into account in COPD management. Based on the existing prevalence data, the authors urge for research to be carried out into effective prevention and intervention strategies of

**Table 1** Characteristics of the study population by body mass index (BMI) category

	Low weight	Normal weight	Overweight	Obesity
	BMI ≤21 (n = 222)	BMI 21.01–24.99 (n = 583)	BMI 25–29.99 (n = 690)	BMI ≥30 (n = 266)
Age*	60.3 (11.2)	62.2 (10.7)	63.9 (10.3)	63.6 (10.0)
Gender (male)	104 (46.8)	363 (62.3)	497 (72.0)	168 (63.2)
Current smoker	154 (69.4)	331 (56.8)	289 (41.9)	111 (41.7)
GOLD stages				
I	32 (14.4)	89 (15.3)	91 (13.2)	22 (13.3)
II	100 (45.0)	362 (62.1)	440 (63.8)	187 (70.3)
III or IV	90 (40.6)	132 (22.6)	159 (23.1)	57 (21.5)
MRC score				
0	55 (24.8)	211 (36.2)	215 (31.2)	46 (17.3)
1	92 (41.4)	238 (40.8)	277 (40.1)	114 (42.9)
2–4	75 (33.8)	134 (23.0)	198 (28.8)	106 (39.8)
Postbronchodilator lung function				
FEV <sub>1</sub> % predicted†	56.5 (18.2)	63.0 (16.8)	62.7 (16.2)	61.1 (13.4)
FVC (litres)†	3.2 (0.96)	3.4 (1.00)	3.4 (1.00)	3.1 (0.92)
FEV <sub>1</sub> /FVC†	0.54 (0.11)	0.57 (0.10)	0.59 (0.09)	0.62 (0.07)

Figures are number and percentage unless stated otherwise.

\*All differences between groups were significant (p < 0.01). †Mean (SD).

FEV<sub>1</sub>, forced expiratory volume in 1 s; FVC, forced vital capacity; GOLD, Global Initiative for Chronic Obstructive Lung Disease; MRC, Medical Research Council.