Respiratory Medicine (2007) **101**, 349–352

respiratoryMEDICINE

SHORT COMMUNICATION

Red cell macrocytosis in COPD patients without respiratory insufficiency: A brief report

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Received 18 November 2005; accepted 3 May 2006

KEYWORDS
COPD;
Dyspnea;
Macrocytosis;
Red cell;
Spirometry

Summary Red cell macrocytosis has been frequently described in hypoxemic patients with chronic obstructive pulmonary disease (COPD). However, macrocytosis is not related to hyoxemia. The objective of this study was to determine the frequency of macrocytosis (defined as mean corpuscular volume (MCV) higher than 94 fl) in stable COPD patients without respiratory insufficiency, and to analyze the possible relationship between its presence and clinical and functional parameters. Fifty-eight consecutive patients with COPD, and without other significant comorbid conditions, were included in the study. Macrocytosis was present in 17 of the 58 stable COPD patients (29%). The differences between patients with and without macrocytosis were not statistically significant, except for MCV. In the subgroup of 36 ex-smoker COPD patients, macrocytosis was present in nine patients (25%). In this subgroup, MCV significantly correlated with dyspnea ($r = 0.36$, $P = 0.03$) and forced expiratory volume in 1 s (FEV_1) ($r = -0.35$, $P = 0.03$). We conclude that macrocytosis is a frequent finding in stable non-hypoxemic COPD patients, and that in ex-smoker patients the degree of macrocytosis is associated with a worse clinical situation in terms of dyspnea and FEV_1.

Introduction

Several studies confirm the relatively high frequency of red cell macrocytosis in patients with chronic obstructive pulmonary disease (COPD).[1–4] This macrocytosis has been generally considered to be secondary to hypoxemia. However, this assumption has not been demonstrated since no significant correlation has been found between macrocytosis and hypoxemia.[4] For this reason, we tried to determine the frequency of macrocytosis in stable patients with COPD without respiratory

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doi:10.1016/j.rmed.2006.05.003

insufficiency, and to analyze the possible relationship between its presence and clinical and functional parameters.

Methods

Fifty-eight consecutive patients with COPD, diagnosed according to international recommendations,[5] (post-bronchodilator forced expiratory volume in 1 s [FEV_1] to forced vital capacity [FVC] < 0.70), and with oxygen saturation higher than 90%, attending the outpatient pulmonary clinic were included. Patients were in clinically stable condition (at least one month without exacerbation), and without other significant comorbid conditions (renal or hepatic disease, congestive heart failure, diabetes mellitus or thyroid dysfunction), or use of systemic corticosteroids, diuretics or cytotoxic drugs. The daily alcohol intake was in all cases lower than 40 g/day, and no other data suggesting alcohol abuse were observed. Patients with anemia (hemoglobin lower than 13 g/dl) were not included. All patients were smokers or ex-smokers.

Data for hematologic variables were obtained in a routine blood sample test, and hematocrit, hemoglobin and mean corpuscular volume (MCV) were recorded. The following data were also recorded: smoking history (pack-years); body mass index (BMI); dyspnea score during normal activities, as measured on the modified Medical Research Council scale,[6] which ranges from 0 (no dyspnea) to 4 (dyspnea with minimum activities); number of exacerbations of COPD during the last 12 months (unscheduled visits to physician, visits to the emergency room, and hospitalizations); and number of prescribed medicines to treat the COPD (short-acting β-agonists, long-acting β-agonists, anticholinergics, methylxanthines, inhaled corticosteroids, mucolytics, diuretics, oxygen). A spirometry was performed (Datospir 120D, Barcelona, Spain), and post-bronchodilator results were considered. Spirometic reference values for the Mediterranean population were used.[7] Oxygen saturation was measured with a pulse oximeter sensor (Datospir 120D, Barcelona, Spain).

Statistical analysis

Data are presented as mean $\pm$ standard deviation (SD) or percentage where indicated. Differences between patients with and without macrocytosis (defined as MCV higher than 94 fl) were compared by unpaired *t*-test or χ^2 test where appropriate. To determine the relationships between variables, Spearman's rank correlation test was used. Because current smoking may alter clinical or hematological parameters, the group of ex-smokers was analyzed separately. A *P*-value less than 0.05 was considered to be statistically significant.

Results

Macrocytosis (defined as MCV higher than 94 fl[4]) was present in 17 of the 58 stable COPD patients (29%). The characteristics of the patients with and without macrocytosis are detailed in Table 1. The

Table 1 Total patients' characteristics ($n = 58$).

	VCM $<$ 94	VCM $>$ 94	*P*
Subjects (number (%))	41 (71%)	17 (29%)	
Male/female	39/2	16/1	
Age (years)	67 $\pm$ 9	69 $\pm$ 8	NS
Ex-smokers ($n = 36$)	27 (66%)	9 (53%)	NS
Smoking history (pack-years)	62 $\pm$ 25	55 $\pm$ 29	NS
Body mass index (kg m^{-2})	29 $\pm$ 6	26 $\pm$ 5	NS
FVC (% predicted)	68 $\pm$ 19	67 $\pm$ 17	NS
FEV_1 (% predicted)	51 $\pm$ 16	45 $\pm$ 16	NS
FEV_1/FVC (%)	52 $\pm$ 12	48 $\pm$ 12	NS
Oxygen saturation (%)	95 $\pm$ 2	94 $\pm$ 2	NS
Dyspnea (MRC scale)	1.1 $\pm$ 1.1	1.0 $\pm$ 1.2	NS
COPD exacerbations in the previous year	1.78 $\pm$ 1.95	1.29 $\pm$ 1.05	NS
Number of prescribed medicines for COPD	2.8 $\pm$ 1.9	3.2 $\pm$ 2.0	NS
Hemoglobin (g/dl)	14.9 $\pm$ 0.8	14.6 $\pm$ 1.1	NS
Mean corpuscular volume (fl)	90 $\pm$ 3	98 $\pm$ 3	$<$0.001
Hematocrit (%)	44 $\pm$ 3	44 $\pm$ 3	NS

FVC, forced vital capacity; FEV_1, forced expiratory volume in 1 s; ER, emergency room.