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**Meta-analysis of the long-term effects of inhaled corticosteroids in chronic obstructive pulmonary disease (COPD)**

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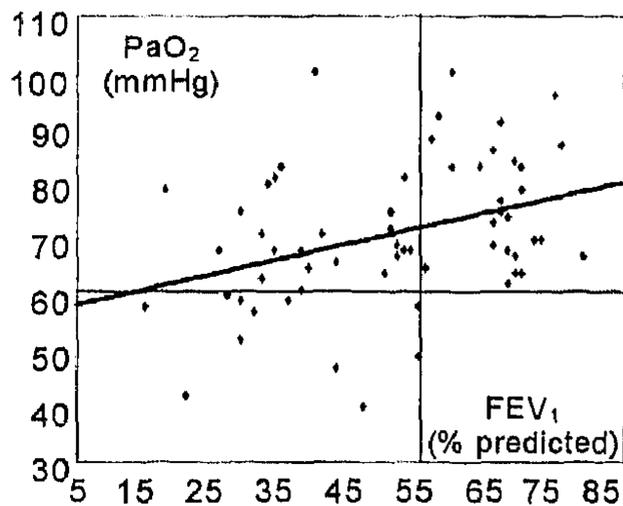
The role of inhaled corticosteroids (ICS) in the long-term management of COPD is still unclear. Therefore, we performed a meta-analysis of the three two-year studies published on this subject (Kerstjens et al: *N Engl J Med* 1992; 327: 1413-9, Derenne et al: *Am J Respir Crit Care* 1995; 151: A463, Renkema et al: *Chest* 1996; 109: 1156-62. Patients with "asthmatic features" were excluded by analyzing the original data. The effect on FEV<sub>1</sub> was assessed by a multiple repeated measurement technique in which time and drug effects were investigated. 95 (of the original number of 140) Patients treated with ICS (81 with 1500 µg beclomethasone, 6 with 1600 µg budesonide, and 8 with 800 µg beclomethasone) were included. 88 Patients treated with placebo were included (of the initially 144 patients). No baseline differences were observed (mean age 61 years, mean FEV<sub>1</sub> = 45%pred.). Worsening of the disease was the drop-out reason in 4 patients of the ICS group vs. 9 of the placebo group (p = 0.11). The estimated two-year difference in the prebronchodilator FEV<sub>1</sub> was +0.090L (95% confidence interval (c.i.) +0.010L to +0.170L) in the ICS group versus placebo, the postbronchodilator FEV<sub>1</sub> showed a difference of +0.083L (95% c.i. +0.003L to +0.163L). In conclusion, this meta-analysis showed beneficial long-term effects of ICS on the FEV<sub>1</sub> in patients with a clear diagnosis of COPD.

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**When to perform arterial blood gases (ABG) in stable chronic obstructive pulmonary disease (COPD)?**

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In patients with stable COPD, there is no agreement on the FEV<sub>1</sub> threshold above which ABG are unnecessary to identify patients who would require supplemental O<sub>2</sub> therapy. The American Thoracic Society and French guidelines recommend to perform ABG when FEV<sub>1</sub> is less than 50% predicted, whereas the European Respiratory Society recommend to perform ABG when FEV<sub>1</sub> is less than 70% predicted. Several studies have shown a poor correlation between spirometry and PaO<sub>2</sub>. We studied data from 60 stable COPD patients to determine the baseline FEV<sub>1</sub> threshold above which patients exhibit no severe hypoxemia (as defined by PaO<sub>2</sub> <60 mmHg). Spirometry and ABG were performed on the same day in each patient, at least three weeks after the last exacerbation.



There was a weak but significant correlation between FEV<sub>1</sub> and PaO<sub>2</sub> ( $r^2 = 0.13$ ,  $p = 0.005$ ). The correlation between FEV<sub>1</sub> and PaCO<sub>2</sub> was stronger ( $r^2 = 0.25$ ,  $p = 0.00005$ ). In all patients whose FEV<sub>1</sub> was >55% predicted, PaO<sub>2</sub> was >60 mmHg.

These data suggest that 55% would be an acceptable FEV<sub>1</sub> threshold above which measurement of ABG are not necessary in stable COPD patients.

2511

**Survey of prescription of long term oxygen therapy outside guidelines**

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Guidelines for the prescription of long term oxygen therapy (LTOT) have been published but many surveys have found a large proportion of patients prescribed LTOT to have arterial oxygen pressure above guideline thresholds. We have surveyed prescribers of LTOT to patients enrolled in the ANTADIR (French National Respiratory homecare network) Observatory. 2081 questionnaires were sent to prescribers identified by 20 regional associations asking if they ever prescribed LTOT to stable COPD patients with PaO<sub>2</sub> ≥ 60 mmHg and asking them to mark any of 9 suggested situations or "other reason" for such prescription. 654 replies

have been received. The mean age of doctors was 43.5 ± 7 yr. and 81% were respiratory physicians. 117/654 (17.88%) had never prescribed LTOT at PaO<sub>2</sub> ≥ 60 mmHg. The remaining 537 marked a median of three options. 154 marked 5 options or more. The commonest motives for prescription outside guidelines were "nocturnal desaturation" (386), "pulmonary hypertension" (331), and "recurrent clinical right heart failure" (314). 172 (31%) doctors ticked at least these three situations together. In contrast the options of prescription "in response to demand by the patient" or "family" were only chosen 40 times. 309 prescribed for "effort desaturation", 215 for dyspnea, 139 for "repeat hospitalization", 127 for "polycythaemia". We conclude that physicians prescribe LTOT outside guidelines for objective rather than subjective reasons of perceived severity of disease and trials of efficacy of LTOT in these circumstances are required.

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**Nocturnal oxyhemoglobin desaturation (NOD) as predictor of long-term oxygen therapy (LTOT)**

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NOD often occurs among COPD patients with daytime PaO<sub>2</sub> < 60 mmHg, and our aim was to evaluate the outcome of these subjects.

**Methods:** 210 COPD were observed from January 1991 to December 1995: 176 with chronic severe hypoxemia (PaO<sub>2</sub> 50.8 ± 6.5 mmHg) treated with LTOT (LTOT subjects) and 34 with NOD, assessed by 15% of the recorded time with SaO<sub>2</sub> < 90 and diurnal PaO<sub>2</sub> 64 ± 7 mmHg (NOD subjects).

**Results:** We compared age and FEV<sub>1</sub> of LTOT subjects and NOD subjects (Student's t test, level of significance  $p < 0.05$ ). NOD subjects compared to LTOT subjects were younger (64 ± 3 vs 70 ± 0.4 yrs;  $p < 0.005$ ), had FEV<sub>1</sub> higher (50 ± 2.7 vs 38.6 ± 2.7% predicted;  $p < 0.0001$ ). During follow-up, daytime PaO<sub>2</sub> in 10/34 NOD subjects fall to values that required LTOT: these patients showed, compared to other 24 NOD subjects, FEV<sub>1</sub> % significantly reduced (42 ± 7 versus 56.6 ± 2%,  $p < 0.0001$ ) and greater Pack Years (58 ± 15 versus 35 ± 13,  $p < 0.0001$ ) while age was not significantly different (61.3 ± 4.6 versus 64.6 ± 5.6).

**Conclusions:** We speculate that our 34 NOD patients are a subgroup, with an earlier stage of their disease, leading progressively to severe chronic hypoxemia: bronchial obstruction and Pack Years are the risk factors for the worsening diurnal PaO<sub>2</sub>.

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**Assessment of domiciliary oxygen therapy effectiveness by means of arterial blood gas analysis at home and long-term oximetry in patients with COPD**

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**Aim:** 1. To assess if domiciliary oxygen therapy (DO) in COPD patients, is effective to reach, breathing oxygen, a resting PaO<sub>2</sub> ≥ 60 mm Hg and a CT<sub>90</sub> (percentage of time spent with SpO<sub>2</sub> < 90%) while breathing oxygen < 15%. 2. To assess the cause of DO failure: Malfunctioning oxygen delivery system (MODS), Insufficient prescribed oxygen dose (IOD), Patient's mistake (PM), or Mixed reasons (MR). 3. To analyse the sensitivity of long-term home oximetry in detecting patients with a resting, breathing oxygen, PaO<sub>2</sub> < 60 mm Hg.

**Methods:** 73 clinically stable COPD patients with chronic respiratory insufficiency, without other heart, pleural, lung or thorax notable pathologies that have been using DO for at least 1 year (55 concentrators, 8 cylinders and 10 liquid oxygen system) were consecutively recruited from ambulatory control of 5 Hospitals.

**Interventions and Measurements:** Arterial blood gases determined at rest, breathing oxygen at patients' home and breathing room air in the hospital. Technical check of oxygen sources using a gas analyser and a precision rotameter. Oximetry recording during the oxygen therapy time, considering two different periods: "day with oxygen (DOX)" and "sleep with oxygen (SOX)".

**Results:** (1) 9 patients (12.3%) of 73 studied were excluded because they had a resting room air PaO<sub>2</sub> ≥ 60 mm Hg.

(2) 29 patients (45.3%) of 64 with a resting room air PaO<sub>2</sub> < 60 mm Hg, were poorly controlled with their DO: 13 (20.3%) showed a resting, breathing oxygen, PaO<sub>2</sub> < 60 mm; 16 (25%) had a CT<sub>90</sub> > 15% during DOX and/or SOX.

(3) 26/73 (36%) oxygen delivery systems supply flows lower or equal to 75% of flow indicated on their caudalimeter. 54/55 concentrators deliver oxygen with concentration > 90%.

(4) The causes of DO failure were: MODS 6/29, IOD 14/29, PM 2/29 and MR 7/29

(5) 12 patients of 13 with a resting breathing oxygen PaO<sub>2</sub> < 60 mm Hg had a CT<sub>90</sub> > 15% during DOX and/or SOX. Sensitivity of oximetric recording = 92.3%.

**Conclusions:** (1) The insufficient oxygen flow by MODS, IOD, PM or MR produce unsatisfactory control of hypoxemia in 45% of COPD patients with DO studied.

(2) The long-term oximetry is an adequate method to evaluate the effectiveness of DO. It should be used systematically.

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