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Prognostic value of a low hematocrit in COPD: a 20-year study of the ANTADIR observatory

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Purpose: the haematologic responses to chronic respiratory insufficiency remain unclear. Our goal was to determine the prognostic value of hematocrit (Ht) in severe COPD.

Methods: We selected 3,723 patients from the ANTADIR observatory between 1980 and 1999. They all fulfilled a diagnosis of COPD requiring long-term oxygen therapy. Ht value, PFTs and outcome events were collected. A Multivariate Cox proportional hazard regression was conducted to test whether Ht was an independent predictor of mortality and hospitalization.

Results: Mean Ht value was 45.6 ± 6.6 for male and 43.5 ± 6.0 for female. Ht was negatively associated with the age (r=-0.238, p < 0.001). PaO2 (r=-0.061, p < 0.001) and with FEV1/FVC (r=-0.068, p < 0.001) whereas it was positively associated with PaCO2 (r=0.166, p < 0.001), and BMI (r=0.152, p < 0.001). In a multivariate analysis, Ht was the second most important variable after the age in predicting survival (p < 0.001). The 3-years survival rate was 29% (95%CI 22-37%) for patients with Ht below 35%, and 70% (95%CI 64-75%) for patients with Ht ≥ 55%. In a univariate analysis, Ht was the most powerful predictor of the duration of hospitalization (r=-0.100, p < 0.001) and of the rate of hospitalization (r=-0.101, p < 0.001).

Conclusion: This is the first study to provide evidence that a low Ht value is negatively and independently associated with an increased risk of death and hospitalization in severe COPD. Whether maintaining an optimal Ht value in COPD with anemia is of benefit remains to be confirmed.

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Association between plasma folate and airflow obstruction in a cross-sectional community study of middle-aged and elderly

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The B vitamin folate has many fundamental properties, such as 1-carbon transfers in DNA and RNA synthesis and amino acid metabolism. The airways' defence mechanisms working against the development of irreversible airflow obstruction may benefit from high blood levels of folate.

Aim: To determine whether plasma levels of folate are correlated with obstructive airflow limitation in an adult general population.

Method: An age-gender stratified random sample of women and men 47-48 and 71-73 years old were invited to spirometry, before and 15 minutes after inhaling 400 mg salbutamol. The level of airflow obstruction was expressed as FEV1/FVC% (post bronchodilator FEV1/FVC × 100 (%)). Non-fasting blood samples and self-administered questionnaires on smoking history and educational background were collected.

Results: 3506 subjects participated (69%). The mean (±SD) FEV1/FVC% in middle-aged and elderly were 81.4 (5.3) % and 77.0 (8.0) %, respectively. In a linear multiple regression analysis adjusted for age and sex, the difference in FEV1/FVC ratio between individuals with folate above and below the median was 0.73% (95%CI 0.27-1.20, p=0.002). Additional adjustment for smoking and educational level reduced this difference to 0.48% (95%CI 0.01-0.95, p=0.044).

Conclusion: A high level of plasma folate is associated with less obstructed airflow in middle-aged and elderly from a general Norwegian population. Residual confounding by smoking cannot be ruled out.

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When is FEV1 loss excessive? – an investigation of the relationship between year-to-year and long-term spirometry changes

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Spirometry is performed to monitor lung health, but variability between tests can hinder recognition of excessive FEV1 declines. We explored the relationship between year-to-year and long-term (average 18 yrs) FEV1 slopes, using 21821 results from 1884 workers who participated in annual spirometry at a chemical plant between 1973 and 2003. Workers with ≥5 valid results over ≥10 years were included (initial age: mean 35, range 18-62 yrs; 91% male; 35% current smokers, 41% nonsmokers). Long-term FEV1 slopes (ml/yr) were calculated for each worker by simple linear regression using all available results, and compared to year-to-year differences (ΔFEV1) in both % and milliliters. Long-term slopes averaged -29.1 ml/yr (-27, -29, -37 ml/yr for male, and -20, -26, and -27 ml/yr for female non-, ex- and cur- smokers, respectively). Excessive long-term decline was defined by the lower 5th%ile of all individual slopes, -68.0 ml/yr.

When interpreting yearly FEV1 change using the 5th%ile of ΔFEV1 (-10% or

Distribution of short-term ΔFEV1 by long-term decline status

Excessive decline?	Mean	Std dev	95th%ile	75th%ile	50th%ile	25th%ile	5th%ile
Yes, n=98 obs=434	-2.3%	15.7	14.4	2.8	-3.0	-7.8	-18.1
	-84ml	383	380	80	-90	-220	-490
No, n=1786 obs=10109	-0.2%	17.3	9.6	2.8	-0.8	-4.0	-10.0
	-24ml	275	320	100	-30	-150	-360

-360 ml) as normal limits, individuals with abnormal short-term declines are more likely to ultimately show excessive long-term declines (odds ratio=3.8).

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Incidence of COPD in Northern Sweden

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Objectives: To estimate the 7-year cumulative incidence of COPD in a sample of middle aged and elderly.

Methods: The third follow-up survey of the Obstructive Lung Disease in Northern Sweden (OLIN) Studies 1st cohort was performed in 1996. The sample was stratified by age and gender. A random sample of 1500 postal questionnaire responders was invited to a structured interview and lung function test, and 1282 subjects (85%) participated. Of those 77% participated in a follow-up 2003, and preliminary data are available from subjects with lung function tests at both occasions.

Results: 41% were non-smokers, 35% ex-smokers, and 24% smokers in 1996. Spirometric criteria of COPD according to GOLD, FEV1/FVC < 0.70, was used. The 7-year cumulative incidence of COPD by age was estimated to 20.3% from age 76-77 to 83-84 y, 18.0% from age 61-62 to 68-69 y, and 8.1% from age 46-47 y to age 53-54 y, respectively. Among smokers, the corresponding figures were 66.7%, 33.3% and 13.0%. Subjects not participating in the follow-up had a significantly lower mean FEV1 1996 compared to participants (2.51 vs. 2.95, p<0.001).

Conclusion: The 7-year cumulative incidence of COPD was strongly correlated to smoking and higher age. The incidence was similar from age 76-77 to 83-84 y and 61-62 to 68-69 y, and still high but much lower from age 47-48 to 54-55 y. The GOLD criteria has a high sensitivity but probably a low specificity for COPD in elderly.

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Secondhand tobacco smoke exposure and the risk of COPD

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Background: Although most COPD is caused by smoking, up to 20% of cases occur among never smokers and have other causes. Secondhand smoke (SHS) exposure contains potent respiratory irritants, but its role in causing COPD remains unknown.

Methods: We used random digit dialing to select a population-based sample of 2,113 U.S. adults aged 55 to 75 years. Using structured telephone interviews, we identified 386 respondents with COPD, defined as self-reported physician diagnosed chronic bronchitis, emphysema, or COPD. We ascertained cumulative lifetime SHS exposure at home and work, which we divided into quartiles. Multivariate logistic regression was used to evaluate the impact of lifetime SHS exposure on the risk of COPD after controlling for age, sex, race, educational attainment, marital status, and past smoking history.

Results: Cumulative lifetime years of SHS exposure at home and work were associated with the risk of developing COPD. Compared to the lowest quartile of lifetime home SHS exposure, the highest home exposure quartile was associated with a greater risk of COPD (OR 1.68; 95% CI 1.19 to 2.38). For workplace exposure, the highest cumulative lifetime exposure quartile was also related to a greater risk of COPD (OR 1.60; 95% CI 1.20 to 2.14). The population attributable risk proportion for home and work SHS exposure was 17% and 13%, respectively. **Conclusion:** Lifetime SHS exposure is a risk factor for developing COPD. Approximately 1 in 6 COPD cases may be due to home SHS exposure, and 1 in 8 COPD cases may result from workplace SHS exposure.

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