CHOPN novinky

Vladimír Koblížek

Plicní klinika FN HK a UK LF HK

Úvod

+ Všichni se denně setkáváme s pacienty s CHOPN

+ Všichni je rutinně diagnostikujeme

+ Všichni je nějak léčíme

+ Není jiná nemoc, kterou pneumolog v roce 2022 tak často viděl než COVID, BCA a COPD (CHOPN)

Agenda

+ Diagnostika
+ Biomarkery
+ Terapie
+ Prognóza
+ Paliativní péče
+ Kontroverze

DIAGNOSTIKA

COPD existuje i u osob <40 let

International Journal of Chronic Obstructive Pulmonary Disease

Dovepress
open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

Prevalence of Chronic Obstructive Pulmonary Disease and Chronic Bronchitis Among Predominantly Smoking Workers in the Seafood Industry in Greenland

Anja Lærke Frederiksen[1], Birgitte Hamann Laustsen[2,3], Jesper Bælum[4],
Michael Lynge Pedersen[1,3], Jakob Hjort Bønløkke[5]

May 2022 Int J COPD

Smoking prevalence both in young adults and in the main population in Greenland (52%) compared with 23% of the adult be high compared with that of other countries given the age of our study participants. This is in line with a very high population in Denmark in 2018.

Introduction: For decades, the prevalence of smoking has been high in Greenland. Even so, the prevalence of chronic obstructive pulmonary disease (COPD), a smoking-related disease, remains largely unexplored. This cross-sectional study aimed to estimate the prevalence of COPD and chronic bronchitis (CB) among Inuit workers in the seafood industry in Greenland.

Methods: A total of 355 participants, 254 males and 101 females, met the inclusion criteria. Participants had a mean age of 38 years (standard deviation 13.5; range 17–68 years). COPD was diagnosed based on post-bronchodilator ratio between forced expiratory volume within one second and forced vital capacity (FEV_1/FVC) below the lower limit of normal (LLN) according to the Global Lung Function Initiative. Participants completed a questionnaire aiming to diagnose CB.

Results: The overall prevalence was 9.9% for COPD; 7.4% for CB. Participants were predominantly smokers; 73.2% active smokers, 91.8% active or former smokers. The prevalence of COPD was high, especially among those under 40 years of age. Both COPD and CB were associated with smoking status.

Discussion: This study among Greenlandic seafood workers found that smoking was a risk factor for COPD and CB among Greenlanders of Inuit origin. The high prevalence of COPD and the high prevalence of smoking underlines the importance of further initiatives to reduce smoking in Greenland.

The prevalence of COPD among participants working in the seafood industry younger than 40 years was 10.9%.

FEF₂₅-₇₅ nový dg. ukazatel funkce plic

Chronic Obstructive Pulmonary Diseases:
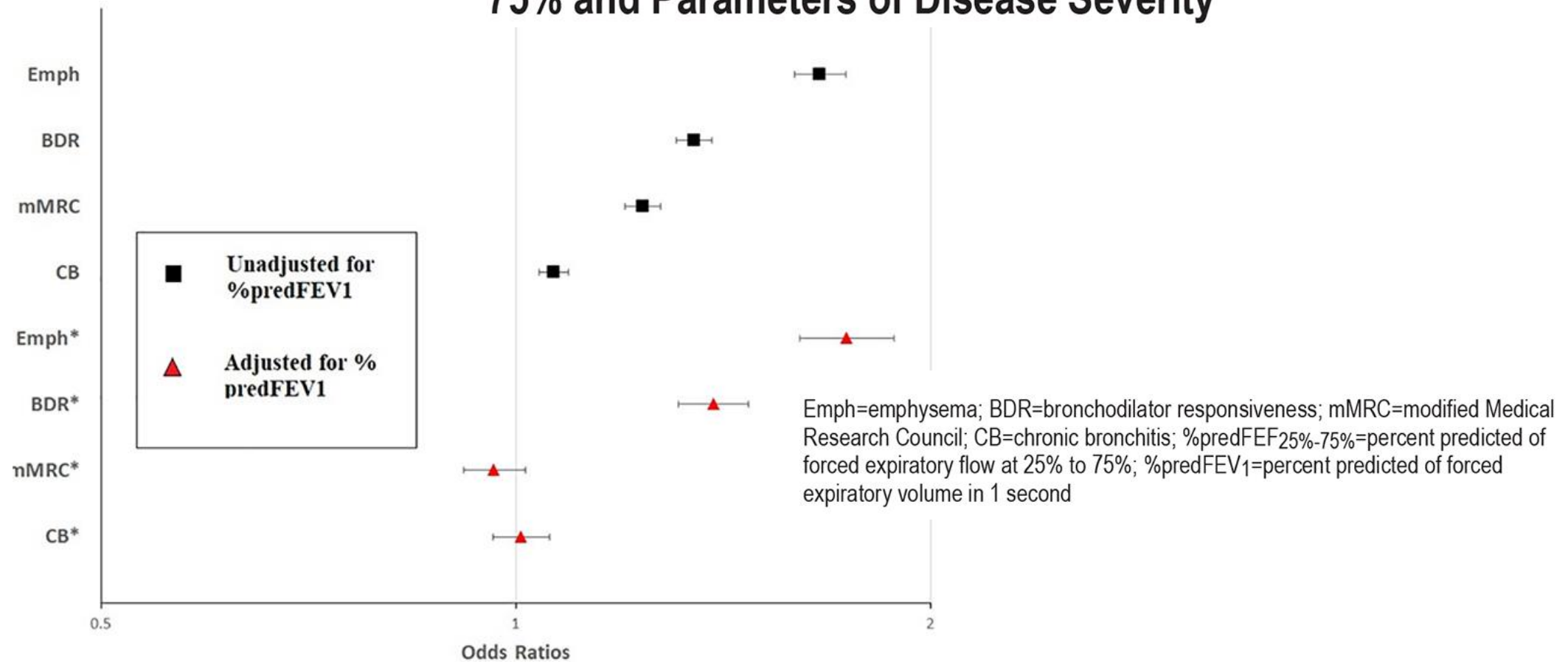**Journal of the COPD Foundation®**

COPD FOUNDATION®

Original Research

Forced Expiratory Flow at 25%-75% Links COPD Physiology to Emphysema and Disease Severity in the SPIROMICS Cohort

Bonnie E. Ronish, MD[1] David J. Couper, PhD[2] Igor Z. Barjaktarevic, MD, PhD[3] Christopher B. Cooper, MD[3,4]
Richard E. Kanner, MD[1] Cheryl S. Pirozzi, MD, MS[1] Victor Kim, MD[5] James M. Wells, MD[6] MeiLan K. Han, MD, MS[7]
Prescott G. Woodruff, MD, MPH[8] Victor E. Ortega, MD, PhD[9] Stephen P. Peters, MD, PhD[10] Eric A. Hoffman, PhD[11]
Russell G. Buhr, MD, PhD[3,12] Brett A. Dolezal, PhD[3] Donald P. Tashkin, MD[3] Theodore G. Liou, MD[1]
Lori A. Bateman, MS[2] Joyce D. Schroeder, MD[13] Fernando J. Martinez, MD, MS[14] R. Graham Barr, MD, PhD[15]
Nadia N. Hansel, MD, MPH[16] Alejandro P. Comellas, MD[17] Stephen I. Rennard, MD[18] Mehrdad Arjomandi, MD[8,19]
Robert Paine III, MD[1]

June 2022 J COPD F

Figure 4. Relationship Between Percent Predicted Forced Expiratory Flow at 25% to 75% and Parameters of Disease Severity

Emph=emphysema; BDR=bronchodilator responsiveness; mMRC=modified Medical Research Council; CB=chronic bronchitis; %predFEF$_{25\%-75\%}$=percent predicted of forced expiratory flow at 25% to 75%; %predFEV$_1$=percent predicted of forced expiratory volume in 1 second

Background: Forced expiratory volume in 1 second (FEV_1) is central to the diagnosis of chronic obstructive pulmonary disease (COPD) but is imprecise in classifying disease burden. We examined the potential of the maximal mid-expiratory flow rate (forced expiratory flow rate between 25% and 75% [$FEF_{25\%-75\%}$]) as an additional tool for characterizing pathophysiology in COPD.

Objective: To determine whether $FEF_{25\%-75\%}$ helps predict clinical and radiographic abnormalities in COPD.

Study Design and Methods: The SubPopulations and InteRediate Outcome Measures In COPD Study (SPIROMICS) enrolled a prospective cohort of 2978 nonsmokers and ever-smokers, with and without COPD, to identify phenotypes and intermediate markers of disease progression. We used baseline data from 2771 ever-smokers from the SPIROMICS cohort to identify associations between percent predicted $FEF_{25\%-75\%}$ (%pred$FEF_{25\%-75\%}$) and both clinical markers and computed tomography (CT) findings of smoking-related lung disease.

Results: Lower %pred$FEF_{25\%-75\%}$ was associated with more severe disease, manifested radiographically by increased functional small airways disease, emphysema (most notably with homogeneous distribution), CT-measured residual volume, total lung capacity (TLC), and airway wall thickness, and clinically by increased symptoms, decreased 6-minute walk distance, and increased bronchodilator responsiveness (BDR). A lower %pred$FEF_{25\%-75\%}$ remained significantly associated with increased emphysema, functional small airways disease, TLC, and BDR after adjustment for FEV_1 or forced vital capacity (FVC).

Interpretation: The %pred$FEF_{25\%-75\%}$ provides additional information about disease manifestation beyond FEV_1. These associations may reflect loss of elastic recoil and air trapping from emphysema and intrinsic small airways disease. Thus, %pred$FEF_{25\%-75\%}$ helps link the anatomic pathology and deranged physiology of COPD.

BIOMARKERY

Nekódující RNA v séru – biomarker COPD ?

Respiratory Research

RESEARCH

Open Access

Check for updates

Comprehensive identification of RNA transcripts and construction of RNA network in chronic obstructive pulmonary disease

Pengcheng Liu[1†], Yucong Wang[2†], Ningning Zhang[1], Xiaomin Zhao[1], Renming Li[1], Yu Wang[1], Chen Chen[1], Dandan Wang[1], Xiaoming Zhang[3], Liang Chen[2*] and Dahai Zhao[1*]
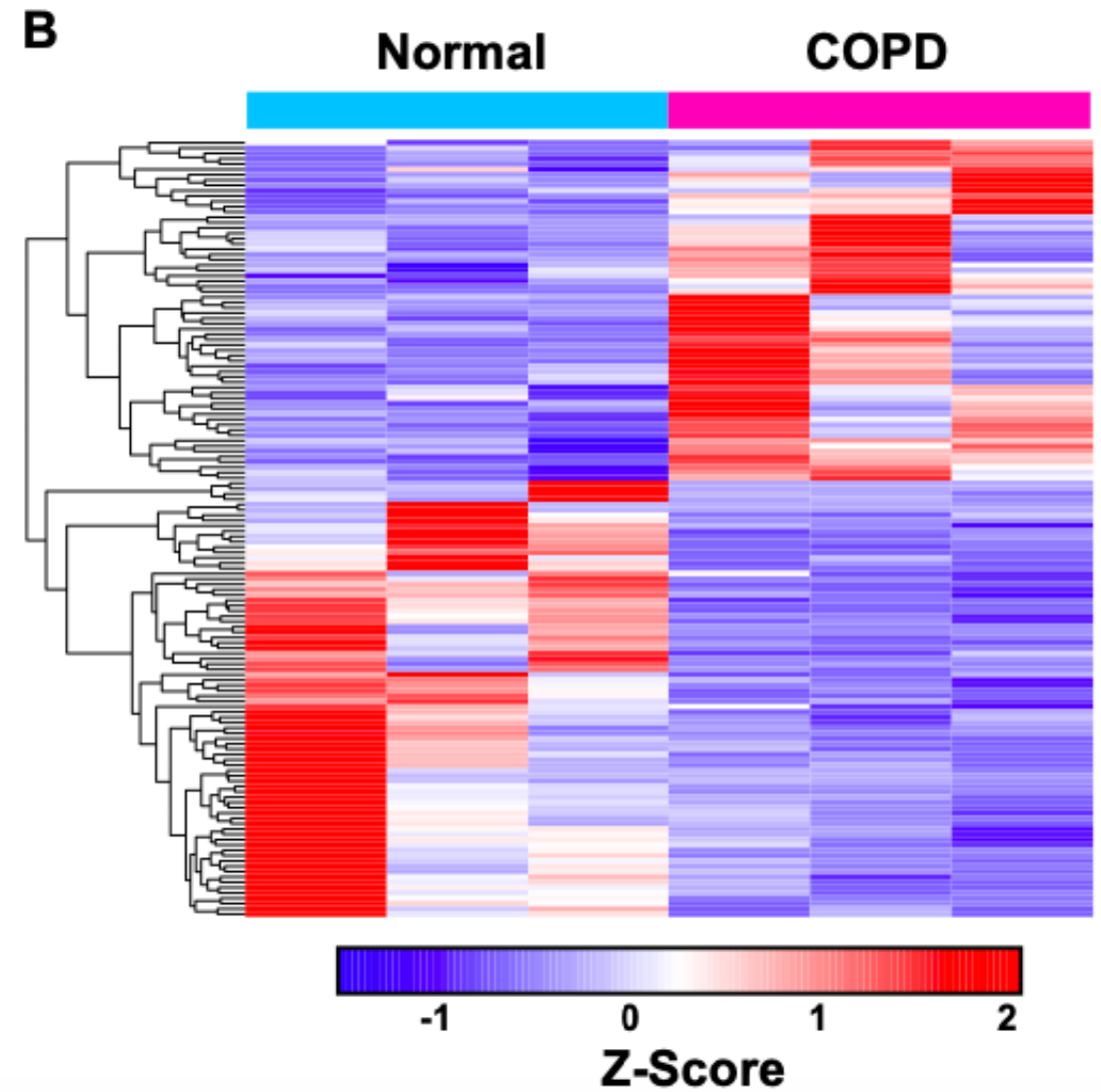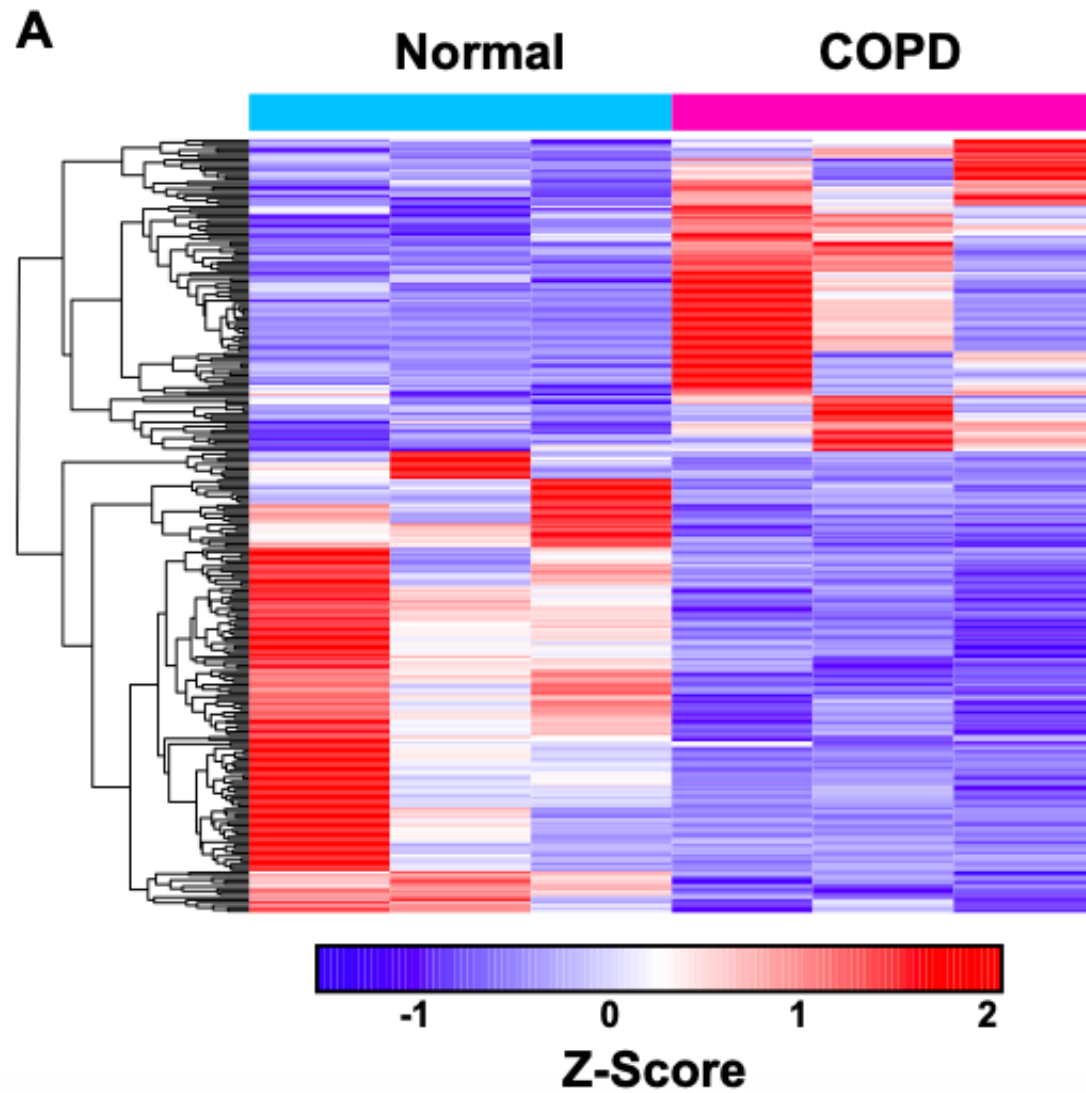
Table 1 Information of the patients for RNA-seq

Characteristics	Control group (n = 3)	COPD group (n = 3)	p-value
Male gender	3 (100.00)	3 (100.00)	> 0.999
Age, years	59.00 ± 4.32	58.00 ± 4.55	0.833
BMI, kg/m^2	23.51 ± 1.82	25.78 ± 3.34	0.446
Ever smoker	0 (100.00)	3 (100.00)	0.100
Current smoker	0 (100.00)	3 (100.00)	0.100
Smoking history (pack-years)	0 ± 0.00	41.67 ± 13.12	0.047
FEV$_1$ (% predicted)	112.40 ± 16.03	55.70 ± 4.65	0.009
FEV$_1$/FVC (%)	82.16 ± 6.33	58.84 (7.69)	0.030
CAT score	0 ± 0.00	6.67 ± 5.25	0.214

Table 2 Information of the patients for RT-qPCR validation

Characteristics	Control group (n = 27)	COPD group (n = 24)	p-value
Male gender	20 (74.1)	19 (79.2)	0.749
Age, years	63.44 ± 10.73	66.21 ± 9.38	0.344
BMI, kg/m^2	23.19 ± 3.02	23.79 ± 3.26	0.504
Ever smoker	7 (25.9)	13 (54.2)	0.049
Current smoker	5 (18.50)	8 (33.30)	0.336
Smoking history (pack-years)	41.43 ± 15.29	44.23 ± 17.19	0.736
FEV1 (%)	107.31 ± 17.23	51.19 ± 18.03	< 0.001
FEV1/FVC (%)	80.63 ± 5.54	48.52 ± 11.23	< 0.001
CAT Score	0 ± 0.00	7.96 ± 7.73	< 0.001

A Hierarchical cluster heatmaps display differentially expressed transcripts among mRNA
B and lncRNA (long non coding RNA)

Další potenciální biomarker COPD ?

International Journal of Chronic Obstructive Pulmonary Disease

Dovepress

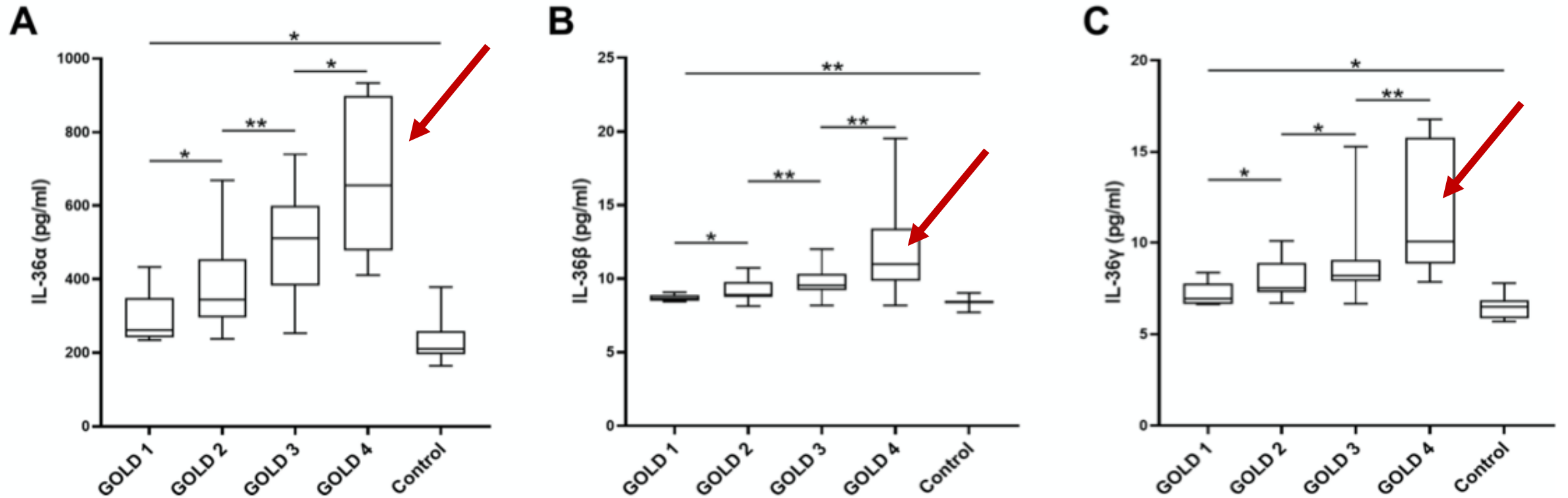open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

IL-36 is Closely Related to Neutrophilic Inflammation in Chronic Obstructive Pulmonary Disease

Siyuan Huang[1],*, Tao Feng[2],*, Jing Wang[1], Liang Dong[3]

Figure 1 IL-36 was highly expressed in patients with COPD and was related to the severity of COPD. The levels of the IL-36α (**A**), IL-36β (**B**), and IL-36γ (**C**) in the serum of patients with COPD were measured using the ELISA kit. The number of samples in each group was as follows, GOLD 1 (n = 6), GOLD 2 (n = 20), GOLD 3 (n = 20), GOLD 4 (n=9), Control (n = 15). Data were pooled from at least 3 independent experiments and are presented as the mean ±SD. *p < 0.05, **p < 0.01.

TERAPIE

Nové LABA, SABA ↑ KV rizika u pts s COPD nebo ACO (ne u astmatu) 20 letá studie

Open Access Full Text Article

ORIGINAL RESEARCH

Association between Inhaled β2-agonists Initiation and Risk of Major Adverse Cardiovascular Events: A Population-based Nested Case-Control Study

Joseph Emil Amegadzie [1], John-Michael Gamble [2], Jamie Farrell [1], Zhiwei Gao [1]

[1]Faculty of Medicine, Memorial University of Newfoundland, St. John's, Newfoundland, Canada; [2]Faculty of Science, School of Pharmacy, University of Waterloo, Waterloo, Ontario, Canada

Correspondence: Zhiwei Gao, Faculty of Medicine, Memorial University, 300 Prince Philip Drive, St. John's, NL, A1B 3V6, Canada, Tel +17098646523, Email zhiwei.gao@med.mun.ca

May 2022 Int J COPD

Table 2 Association Between Use of Inhaled β₂-Agonists-Based Drugs and the Incidence of Major Adverse Cardiovascular Events

OADs/Treatment	Major Adverse Cardiovascular Events		Adjusted Hazard Ratio (95% CI)	p-value (Type 3)
	Case Patients, No. (%)	Controls, No. (%)		
Asthma				
1. ICS (reference)	86 (24.0)	956 (26.9)	1.00	0.08
SABA	262 (73.0)	2407 (67.7)	1.29 (0.96–1.73)	
ICS/LABA	7 (2.0)	93 (2.6)	0.75 (0.33–1.73)	
COPD				
1. ICS (reference)	33 (13.8)	344 (14.6)	1.00	0.175
SABA	153 (64.0)	1430 (60.5)	1.07 (0.67–1.70)	
ICS/LABA	26 (10.9)	220 (9.3)	1.10 (0.60–2.02)	
LABA	12 (5.0)	96 (4.1)	1.26 (0.60–2.68)	
2. SAMA (reference)	15 (6.3)	274 (11.6)	1.00	0.175
SABA	153 (64.0)	1430 (60.5)	2.02 (1.13–3.59)*	
ICS/LABA	26 (10.9)	220 (9.3)	2.08 (1.04–4.16)*	
LABA	12 (5.0)	96 (4.1)	2.38 (1.04–5.47)*	
3. LAMA (reference)	12 (7.7)	211 (10.84)	1.00	0.578
SABA	125 (63.8)	1183 (60.8)	1.47 (0.83–2.62)	
ICS/LABA	23 (11.73)	180 (9.3)	1.76 (0.86–3.61)	
LABA	7 (3.6)	55 (2.8)	1.76 (0.66–4.70)	
Asthma–COPD Overlap				
1. ICS (reference)	13 (14.8)	213 (25.0)	1.00	0.085
SABA	57 (64.8)	456 (53.5)	2.57 (1.26–5.24)*	
ICS/LABA	7 (8.0)	72 (8.4)	1.78 (0.62–5.11)	
2. SAMA (reference)	8 (9.1)	69 (8.1)	1.00	0.085
SABA	57 (64.8)	456 (53.5)	1.09 (0.48–2.50)	
ICS/LABA	7 (8.0)	72 (8.4)	0.76 (0.24–2.36)	

Note: *p < 0.05.

Pozitivní efekt telerehabilitace na redukci rizika AE COPD

International Journal of Chronic Obstructive Pulmonary Disease

Dovepress

open access to scientific and medical research

Open Access Full Text Article

CLINICAL TRIAL REPORT

The Long-Term Maintenance Effect of Remote Pulmonary Rehabilitation via Social Media in COPD: A Randomized Controlled Trial

Yi Li, Hongyu Qian, Kewei Yu (iD), Ying Huang

Department of Respiratory and Critical Care Medicine, Tianjin Chest Hospital, Tianjin, People's Republic of China

May 2022 Int J COPD

Table 3 Predictors of Acute Exacerbations of Chronic Obstructive Pulmonary Disease

Variables	Univariate Analysis			Multivariate Analysis		
	IRR	95% CI	P	IRR	95% CI	P
Age (year)	0.955	0.871–1.106	0.170			
Sex (female)	0.902	0.844–1.073	0.086			
Smoking	1.324	1.208–1.496	0.003*	0.954	0.891–1.166	0.73
FEV1 (pred%)	1.051	0.889–1.175	0.26			
Frequency of AE in prior year	1.277	1.112–1.394	0.009*	1.194	1.103–1.388	0.013*
Home-based PR maintenance	0.766	0.612–0.873	<0.001*	0.712	0.595–0.841	<0.001*
Hospital-based PR maintenance	0.804	0.698–0.941	<0.001*	0.799	0.683–0.927	0.002*
Non-PR maintenance	Ref			Ref		

Note: A p-value less than 0.05 is considered statistically significant and indicated by an asterisk (*).
Abbreviations: IRR, incidence rate ratio; CI, confidence interval; FEV1, forced expiratory volume in 1s; AE, acute exacerbation; PR, pulmonary rehabilitation.
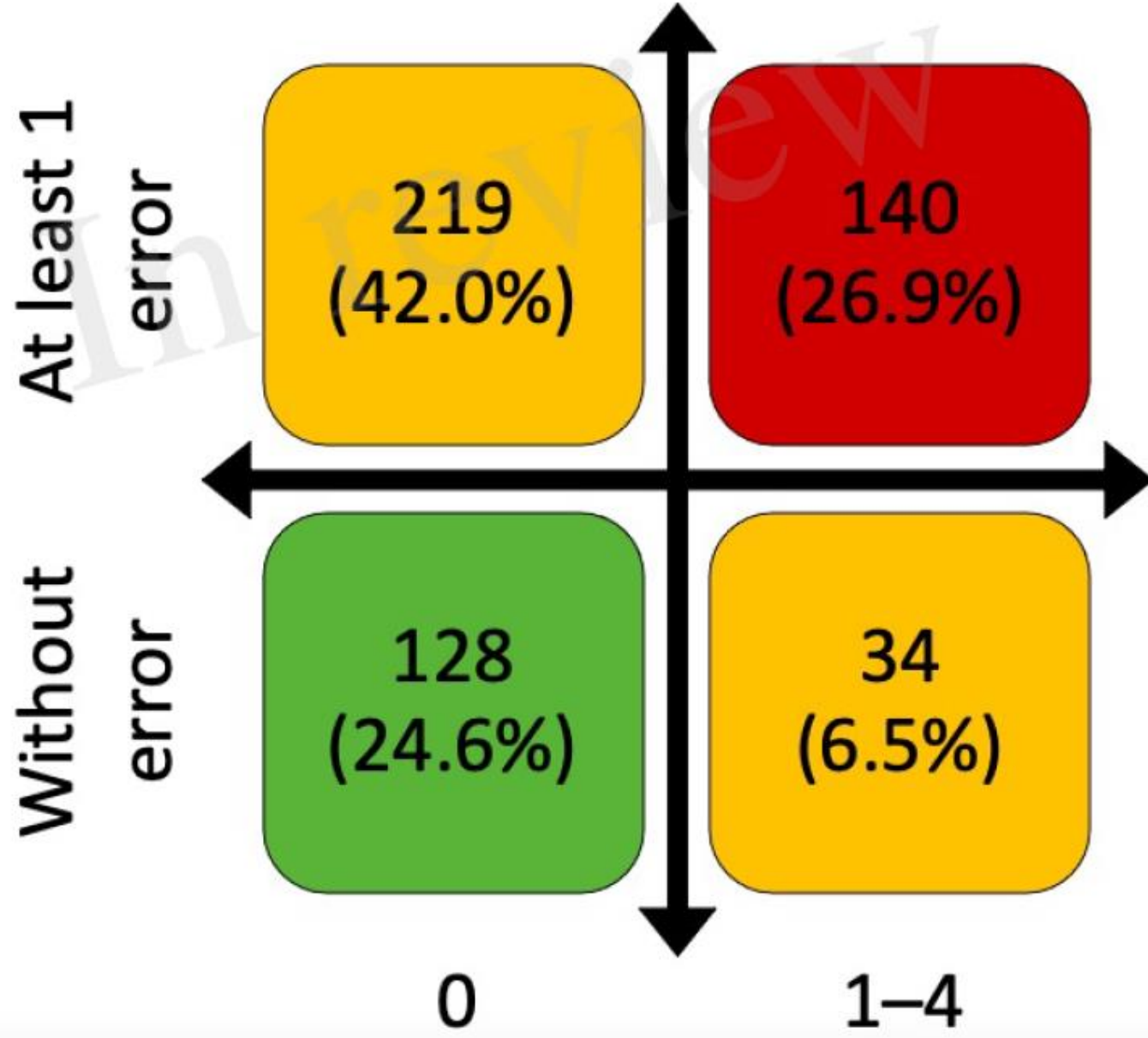
Inhalace je obrovský problem COPD

Self-reported overall adherence and correct inhalation technique discordance in COPD population

Tereza Hendrychova[1], Michal Svoboda[2], Josef Maly[1], Jiri Vlcek[1], Eva Zimcikova[1], Tomas Dvorak[3], Jaromir Zatloukal[4,5], Eva Volakova[5,4], Marek Plutinsky[6,7], Kristian Brat[6,7,8], Patrice Popelkova[9,10], Michal Kopecky[11,12], Barbora Novotna[13,14], Vladimir Koblizek[12,11*]

A-AppIT

At least 1 error: 219 (42.0%) | 140 (26.9%)

Without error: 128 (24.6%) | 34 (6.5%)

0 | 1–4

PROGNÓZA

Plicní hypertenzí trpí 39% pts s COPD

International Journal of Chronic Obstructive Pulmonary Disease

Dovepress

open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

The Incidence and Prevalence of Pulmonary Hypertension in the COPD Population: A Systematic Review and Meta-Analysis

Limin Zhang[1], Yujia Liu[2], Shuai Zhao[1], Zhen Wang[1], Miaomiao Zhang[1], Su Zhang[1], Xinzhuo Wang[1], Shuang Zhang[1], Wenyan Zhang[1], Liying Hao[3], Guangyu Jiao[1]

June 2022 Int J COPD

Table 2 Subgroup Analyses of COPD-Related PH Prevalence

Subgroups	Number of Included Studies	COPD-Related PH					
		Prevalence	Sample (n)	95% CI	I^2	P value	P Within Groups
Continents							
Africa	2	64.0%	372	59.4–68.3	0.0%	0.728	0.000
Asia	18	32.6%	3648	28.4–44.3	96.5%	0.000	
Europe	11	30.4%	1780	23.3–37.6	91.0%	0.000	
North America	7	52.6%	10 437	45.3–60.0	96.9%	0.000	
Enrolment time							
−2010	10	41.8%	2467	31.1–52.5	96.9%	0.000	0.992
2010–2015	4	41.2%	706	18.6–63.8	97.7%	0.000	
2015-	6	42.7%	905	28.4–57.0	95.2%	0.000	
Diagnostic methods for PH							
TTE	23	40.7%	4165	33.3–48.2	96.4%	0.000	0.494
RHC	15	37.0%	12 180	29.0–44.9	98.3%	0.000	
Mean age							
>65	14	35.3%	3387	26.7–43.9	96.8%	0.000	0.082
<65	17	44.5%	12 172	38.7–50.2	96.5%	0.000	

COPD classifications							
I	4	24.5%	104	2.4–46.7	83.1%	0.030	0.024
II	7	34.1%	437	15.6–52.6	95.9%	0.000	
III	8	38.6%	563	23.0–54.2	92.3%	0.000	
IV	8	61.5%	358	46.2–76.8	90.2%	0.000	
Gender							
Female	14	43.5%	2110	38.0–49.1	81.5%	0.000	0.720
Male	14	42.6%	3205	33.5–51.8	95.7%	0.000	
PH grades							
Mild	5	30.2%	543	22.3–38.0	73.9%	0.000	0.000
Moderate	5	10.0%	543	5.7–14.3	64.3%	0.000	
Severe	5	7.2%	543	1.4–13.0	90.1%	0.015	
Sample source							
Lung transplants	8	44.5%	10 844	37.3–51.7	97.2%	0.000	0.247
Outpatients	6	40.5%	1191	33.9–47.2	98.2%	0.000	
Inpatients	7	32.3%	2130	19.4–45.2	97.8%	0.000	
Sample type							
Stable phase	19	38.1%	4209	30.6–45.7	96.6%	0.000	0.998
AECOPD	3	38.2%	717	30.9–45.4	98.7%	0.012	

Široká plicnice ↑ riziko úmrtí u AE COPD
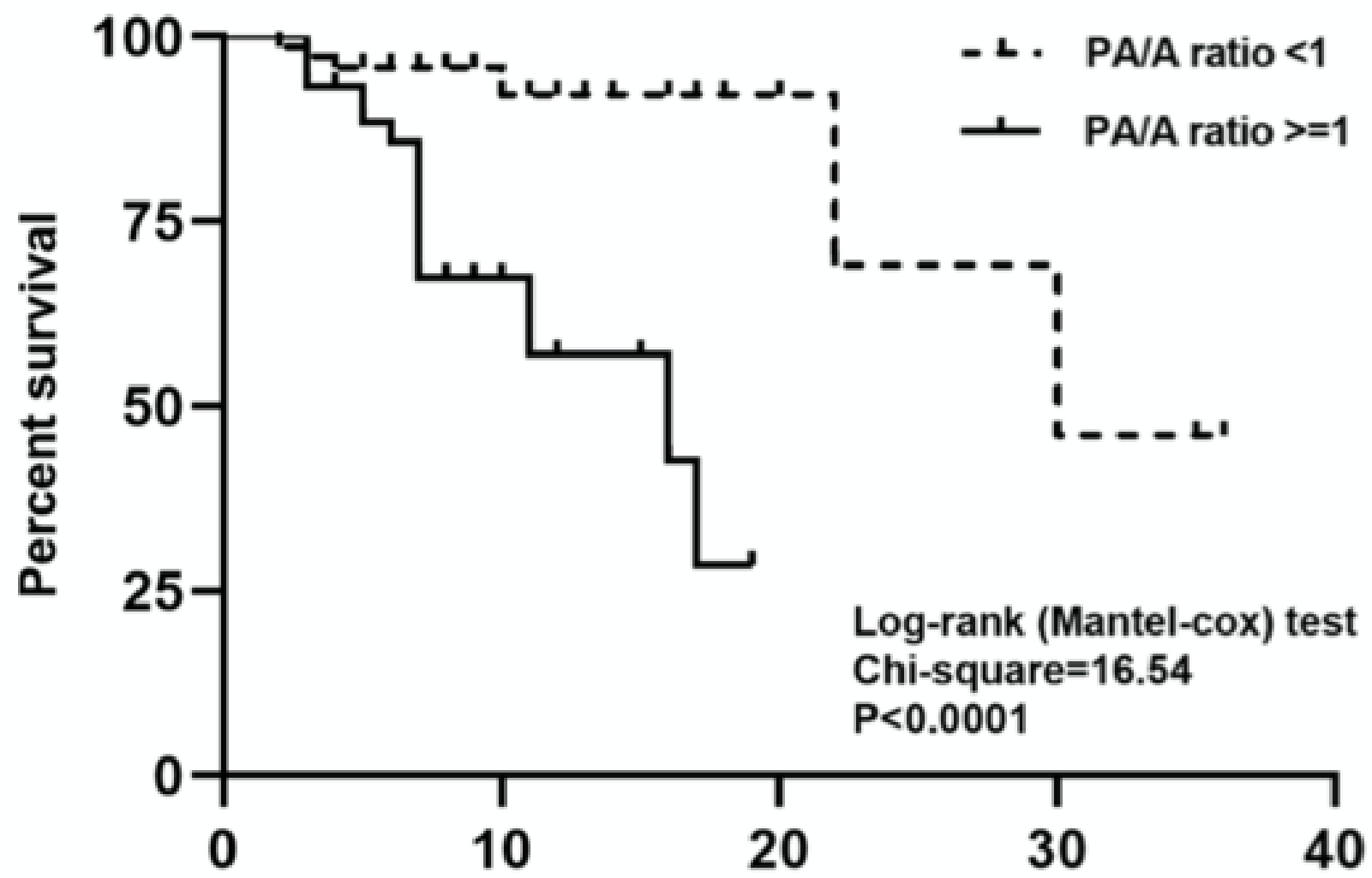
ORIGINAL RESEARCH

The Main Pulmonary Artery to the Ascending Aorta Diameter Ratio (PA/A) as a Predictor of Worse Outcomes in Hospitalized Patients with AECOPD

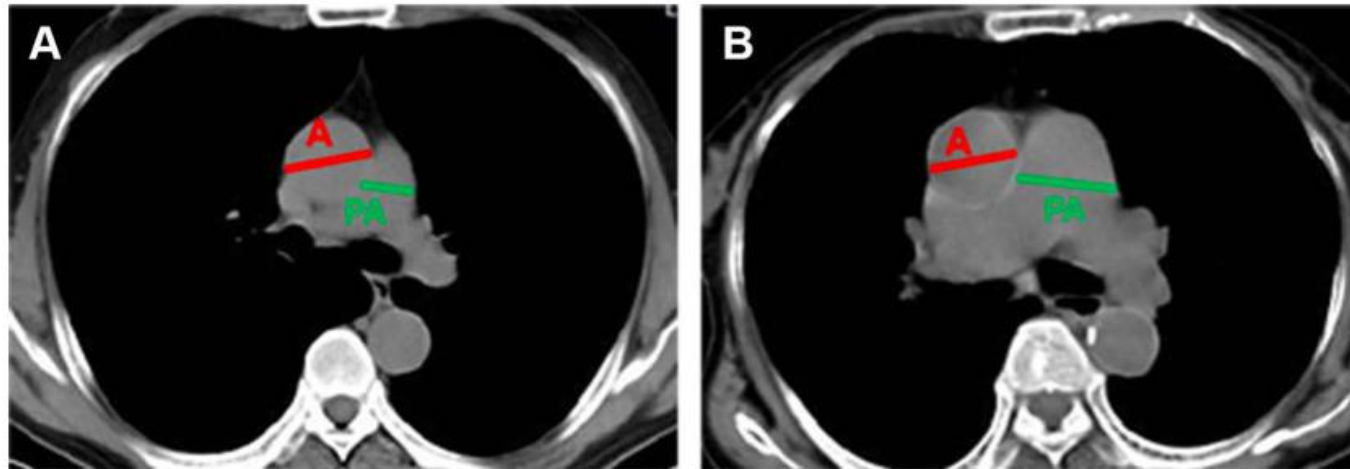Yusheng Cheng[1],*, Lingling Li[1],*, Xiongwen Tu[1], Renguang Pei[2]

May 2022 Int J COPD

Table 3 Multivariate Analysis for Risk Factors of Treatment Failure in AECOPD

Factors	OR Value	95% CI	P value
RDW	1.219	0.905–1.642	0.192
D- dimer	1.161	0.968–1.391	0.108
PLT	0.993	0.983–1.004	0.214
PA/A ratio ≥ 1	6.129	1.665–22.565	**0.006**
RICU admission	0.858	0.212–3.477	0.830
IMV	10.798	2.072–56.261	**0.005**

Note: Bold represents statistically significant.
Abbreviations: AECOPD, acute exacerbations of chronic obstructive pulmonary disease; RDW, blood red cell distribution width; PLT, blood platelet; PA/A, main pulmonary artery to ascending aorta diameter ratio; RICU, respiratory intensive care units; MV, mechanical ventilation.

Hyponatrémie i hypernatrémie u kriticky nemocných s COPD a dalšími chorobami jsou spojeny se zvýšeným rizikem úmrtí do 1 – 3 let
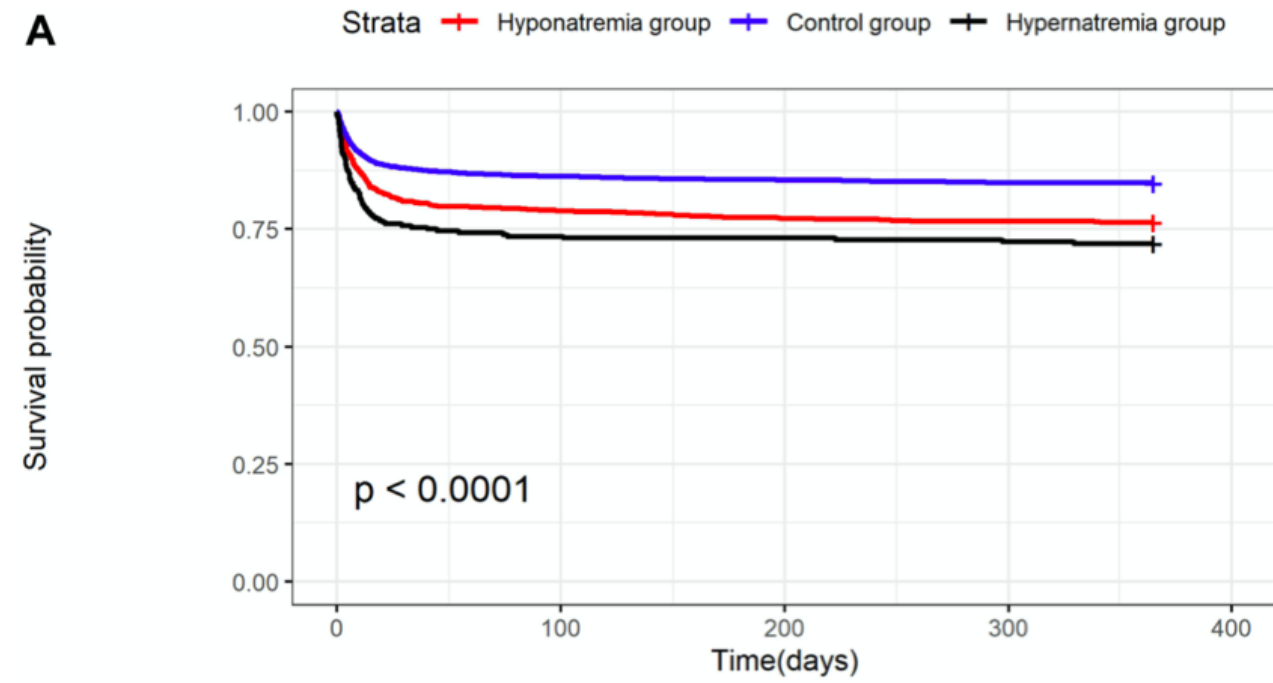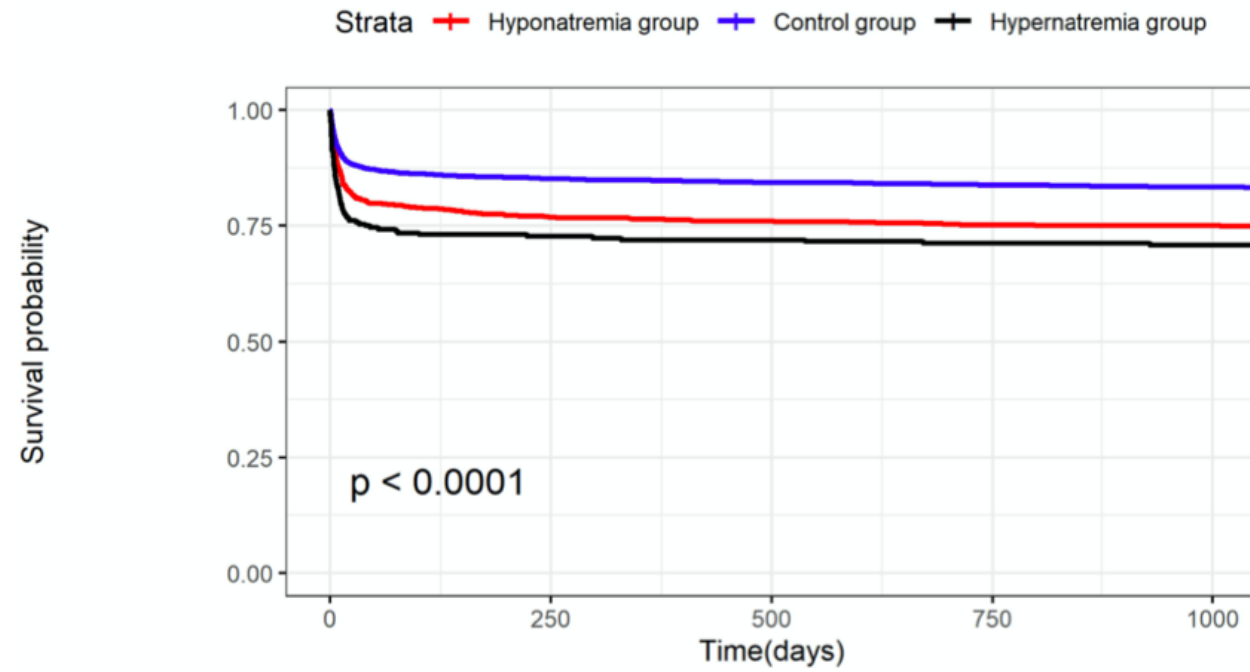
ORIGINAL RESEARCH

Association Between Serum Sodium and Long-Term Mortality in Critically Ill Patients with Comorbid Chronic Obstructive Pulmonary Disease: Analysis from the MIMIC-IV Database

Liming Fan[1],*, Deyang Sun [1],*, Jia Yang[1], Xiawei Shi[1], Fenglin Shen[1], Ke Chen[1], Junchao Yang[1,2]

U každého pacienta sleduj SpO₂

International Journal of COPD

Dovepress

open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

Respiratory parameters predict poor outcome in COPD patients, category GOLD 2017 B

Published in 2018; 10x cited from June 2022 Int J COPD

Table 5B Prediction of all-cause mortality by respiratory parameters – GOLD 2017 B patients

	Cox model of proportional risk	
	HR (95% CI)	p-value
PaO$_2$ (kPa)		
Continuously*	1.282 (0.997–1.647)	0.052
<7.3	3.532 (1.628–7.662)	**0.001**
<8.0	1.462 (0.675–3.169)	0.336
PaCO$_2$ (kPa)		
Continuously**	1.723 (1.085–2.734)	**0.021**
5.0–7.0	Reference category	
<5.0	1.564 (0.712–3.438)	0.265
>7.0	10.185 (2.719–38.158)	**0.001**
Desaturation		
Yes	2.001 (1.090–3.672)	**0.025**

Notes: *HR represents change of risk of mortality, if parameter decreases by unit (lower values are risk). **HR represents change of risk of mortality, if parameter increases by unit (higher values are risk). Desaturation, greatest decrease of SpO$_2$ during 6-MWT (%) >4% and/or minimal SpO$_2$ during (after) 6-MWT (%) <90%. p-values in bold represent significant change of mortality risk (expressed as hazard ratio).
Abbreviations: 6-MWT, 6-minute walking test; HR, hazard ratio; PaCO$_2$, partial pressure of arterial carbon dioxide; PaO$_2$, partial pressure of arterial oxygen; SpO$_2$, peripheral capillary oxygen saturation.

PALIACE

COPD je skoro tak závažná jako BCA využití paliace, ale dost rozdílné

A Canadian study observed that palliative
care was far less frequent in patients
with COPD than in patients with lung cancer
(20% in COPD versus 57% in cancer).

Kendzerska T, Nickerson JW, Hsu AT, et al. End-of-life care in individuals with respiratory diseases: a population study comparing the dying experience between those with chronic obstructive pulmonary disease and lung cancer. Int J Chron Obstruct Pulmon Dis. 2019;14:1691–1701.

Kde umírají ženy/muži s COPD?

International Journal of Chronic Obstructive Pulmonary Disease

Dovepress

open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

Where Do Chronic Obstructive Pulmonary Disease Patients Die? 8-Year Trend, with Special Focus on Sex-Related Differences
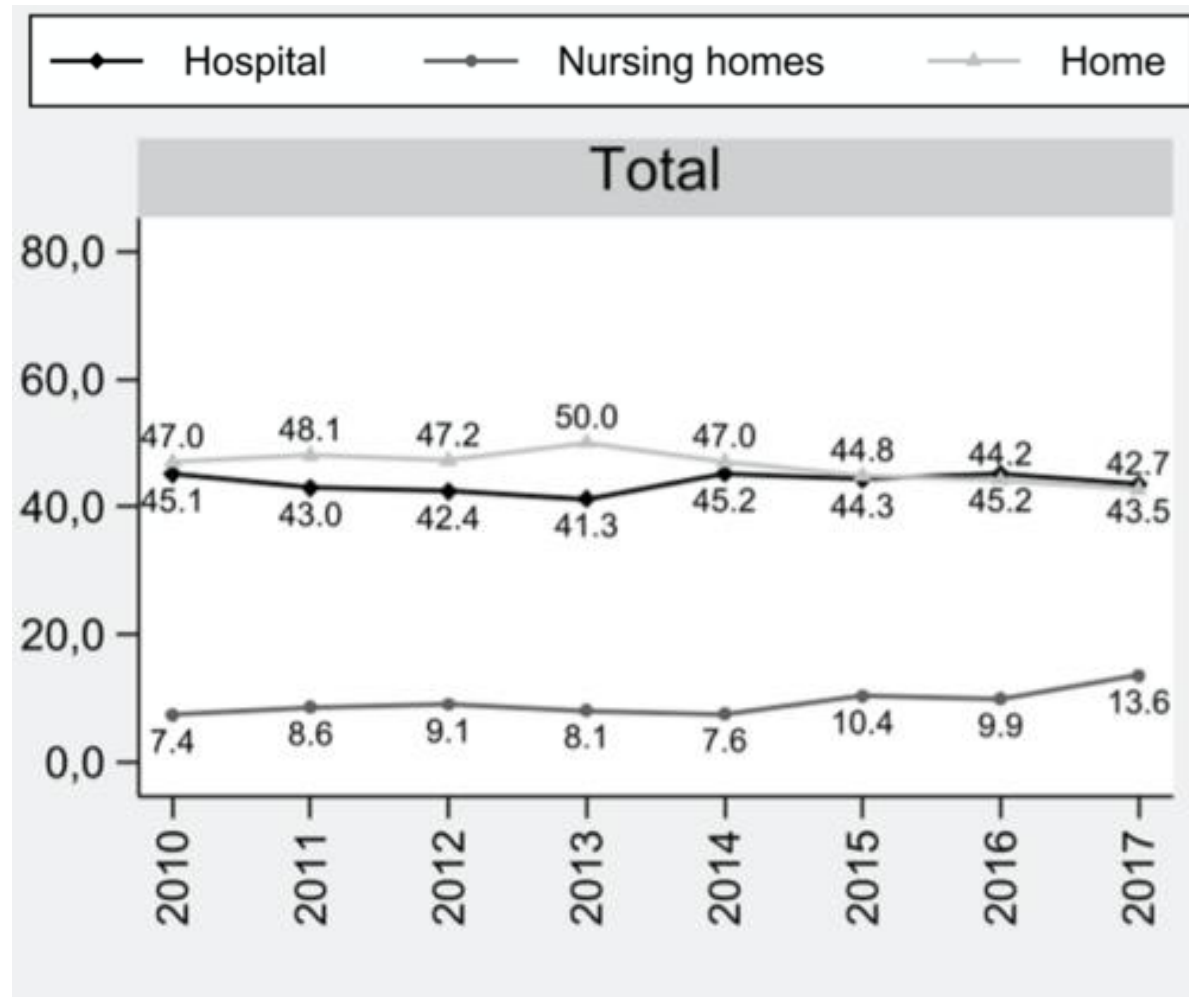
Alberto Fernández-García[1], Mónica Pérez-Ríos[1–3], Cristina Candal-Pedreira[1,3], Cristina Represas-Represas[4,5], Alberto Fernández-Villar [4,5], María Isolina Santiago-Pérez[1,6], Julia Rey-Brandariz[1], Gael Naveira-Barbeito[6], Alberto Malvar-Pintos[6], Alberto Ruano-Ravina[1–3]

[1]Department of Preventive Medicine and Public Health, University of Santiago de Compostela, Santiago de Compostela, Spain; [2]Consortium for Biomedical Research in Epidemiology and Public Health (Ciber en Epidemiología y Salud Pública/CIBERESP), Madrid, Spain; [3]Health Research Institute of Santiago de Compostela (IDIS), Santiago de Compostela, Spain; [4]Respiratory Medicine, Alvaro Cunqueiro University Teaching Hospital, Vigo, Spain; [5]Grupo NeumoVigo I+i, Instituto de Investigación Sanitaria Galicia Sur (IISGS), Vigo, Spain; [6]Epidemiology Unit, Galician Health Authority, Xunta de Galicia, Santiago de Compostela, Spain
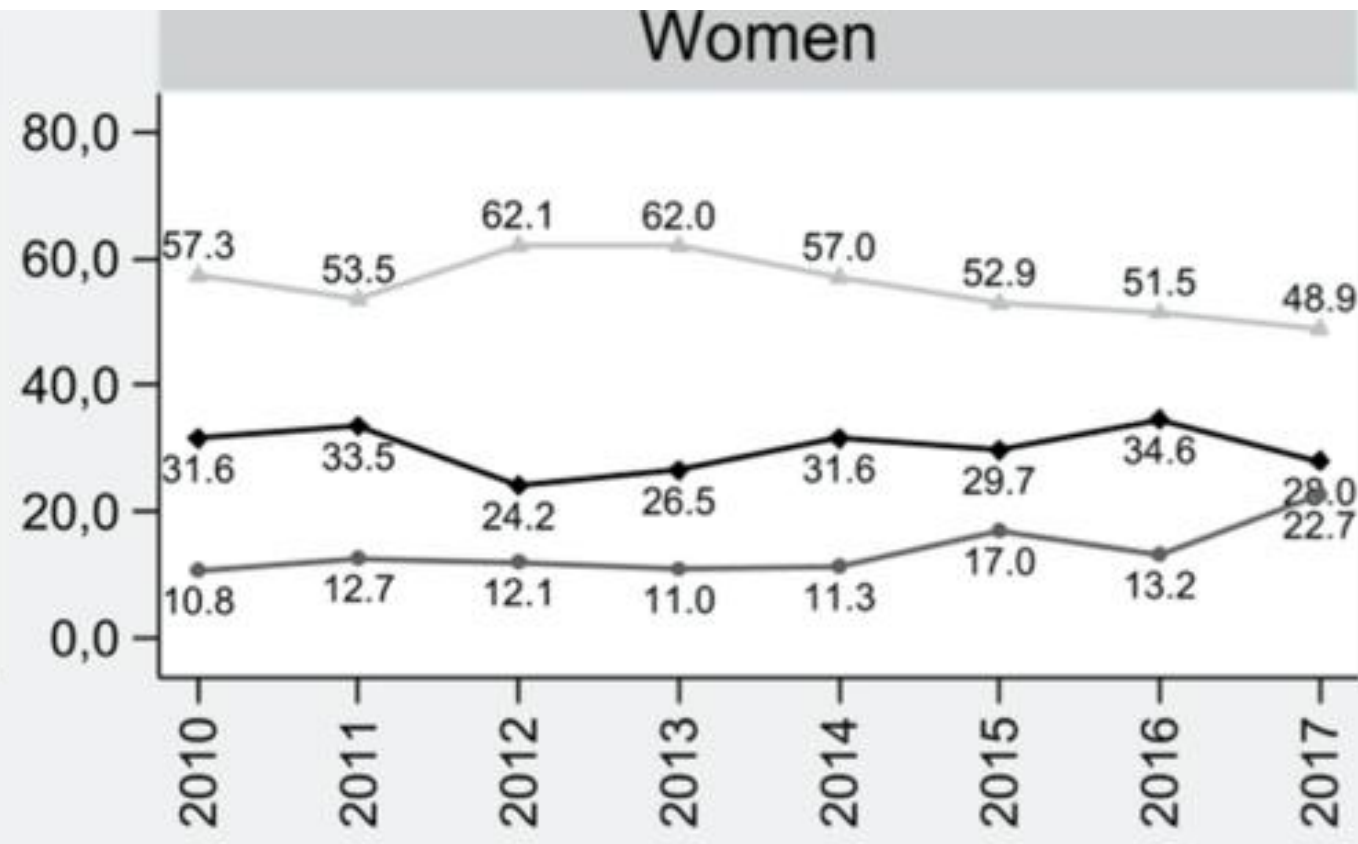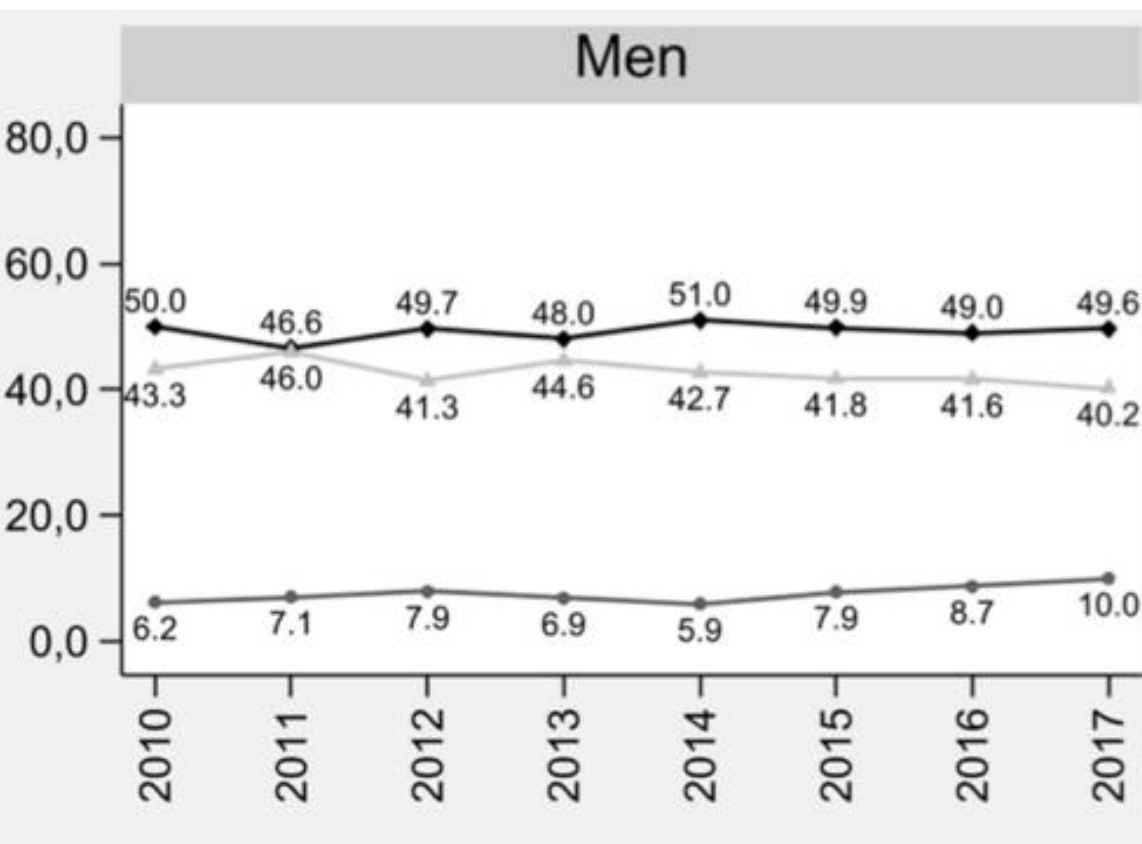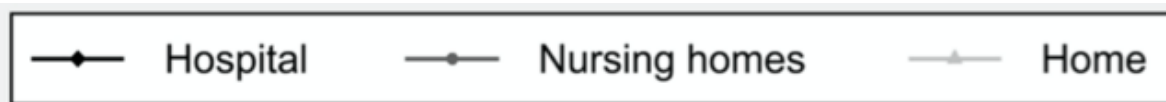
Correspondence: Mónica Pérez-Ríos, Department of Preventive Medicine and Public Health, University of Santiago de Compostela, C/ San Francisco s/n, Santiago de Compostela, 15782, Spain, Tel +34-981-581237, Fax +34-981-572282, Email monica.perez.rios@usc.es
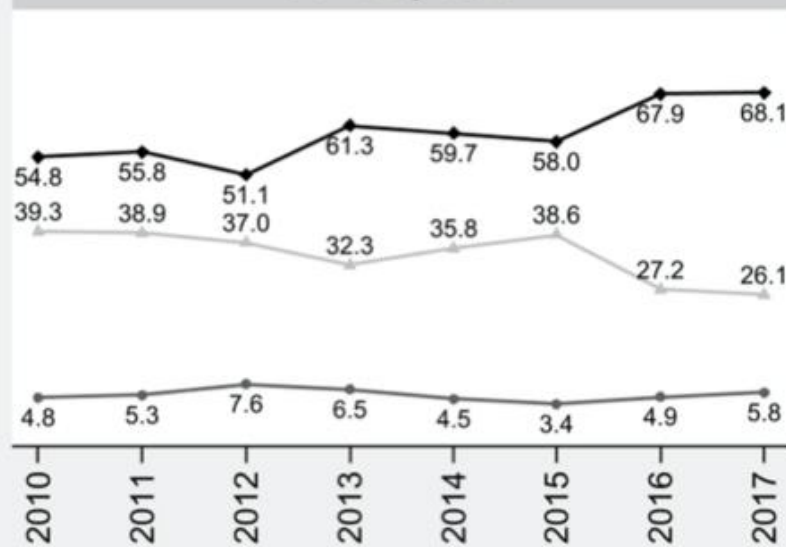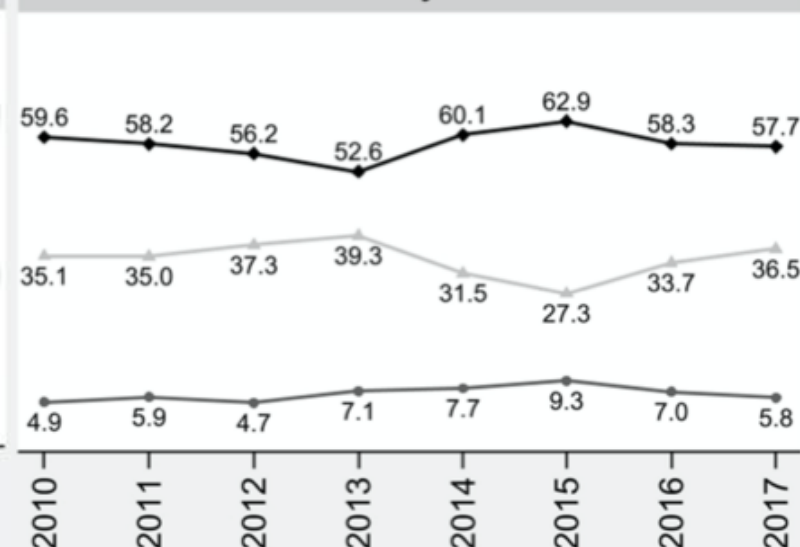
May 2022 Int J COPD

Total

Legend: Hospital (◆), Nursing homes (●), Home (▲)

Year	Home	Hospital	Nursing homes
2010	47.0	45.1	7.4
2011	48.1	43.0	8.6
2012	47.2	42.4	9.1
2013	50.0	41.3	8.1
2014	47.0	45.2	7.6
2015	44.8	44.3	10.4
2016	44.2	45.2	9.9
2017	42.7	43.5	13.6

Men

	2010	2011	2012	2013	2014	2015	2016	2017
Hospital	50.0	46.6	49.7	48.0	51.0	49.9	49.0	49.6
Home	43.3	46.0	41.3	44.6	42.7	41.8	41.6	40.2
Nursing homes	6.2	7.1	7.9	6.9	5.9	7.9	8.7	10.0

Women

	2010	2011	2012	2013	2014	2015	2016	2017
Home	57.3	53.5	62.1	62.0	57.0	52.9	51.5	48.9
Hospital	31.6	33.5	24.2	26.5	31.6	29.7	34.6	29.0
Nursing homes	10.8	12.7	12.1	11.0	11.3	17.0	13.2	22.7

KONTROVERZE

COPD as consequence of premature birth
COPD of non-smokers and biomass exposure
The asthma and COPD overlap
The bronchiectasis and COPD overlap
Non-TB mycobacterial lung disease in COPD
Which inhalator for which patient

ERS MONOGRAPHS 2015-2022