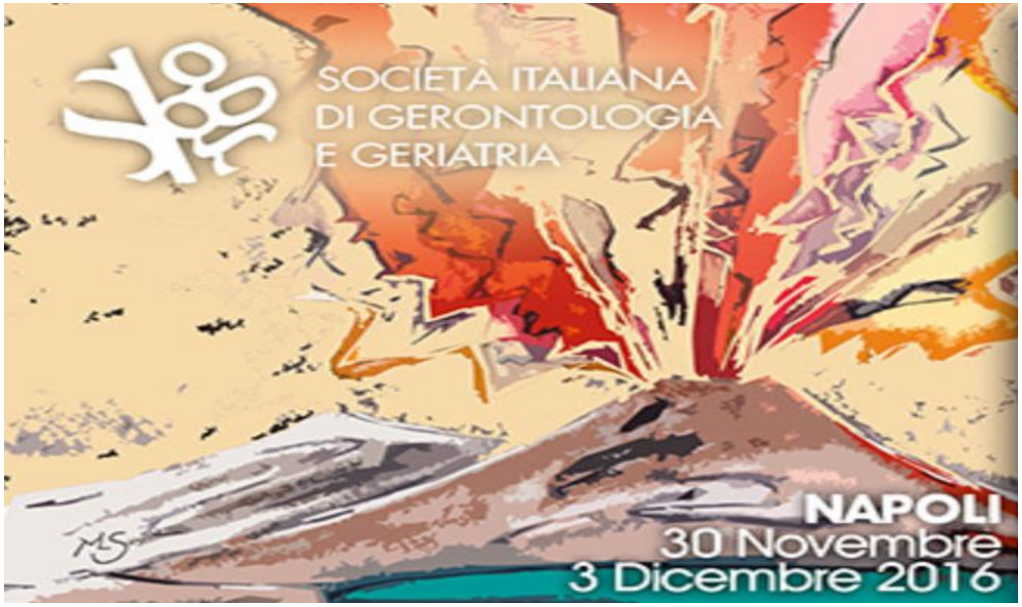
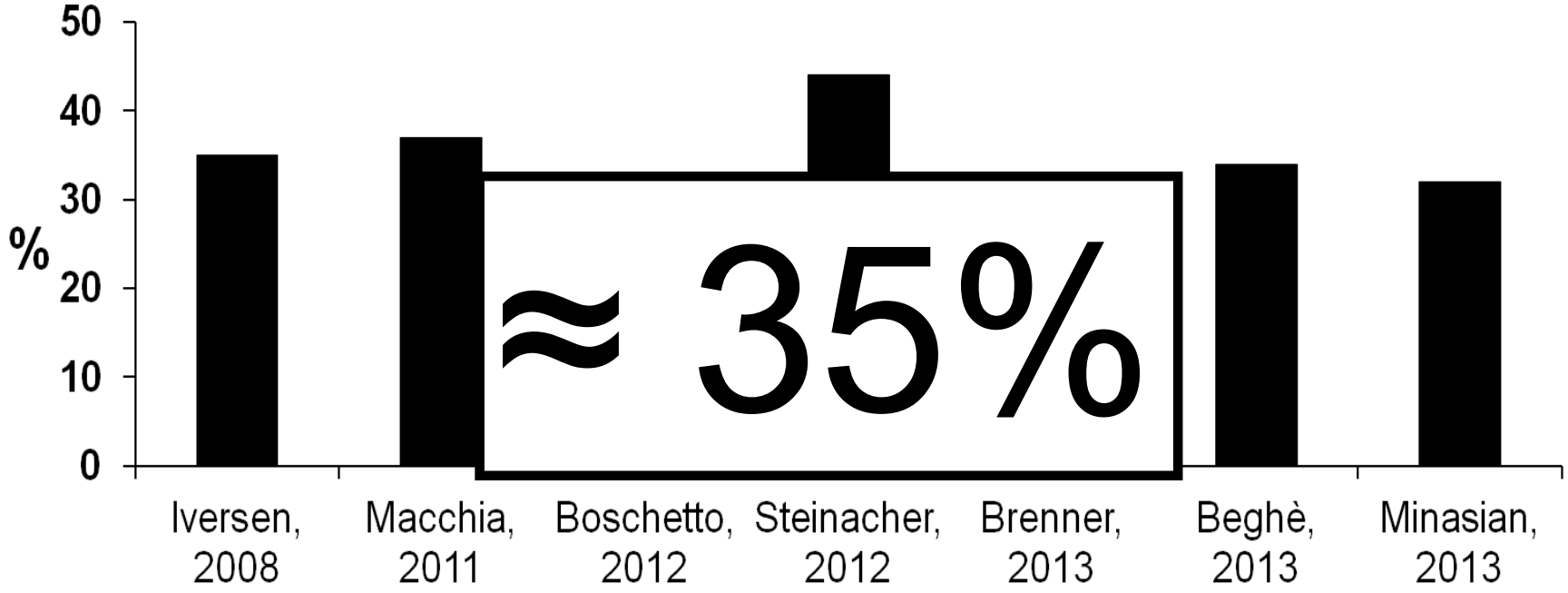


Il management del paziente con BPCO e insufficienza cardiaca

Francesco Cacciatore
UOSD - TRAPIANTI DI CUORE ED ASSISTENZA MECCANICA DEL CIRCOLO
Ospedale Monaldi - Napoli

Prevalence of concurrent chronic obstructive pulmonary disease* in patients with heart failure.



spirometrically defined by a post-bronchodilator forced expiratory volume in 1 s/forced vital capacity ratio *<70% assessed

Impact of COPD on the mortality and treatment of patients hospitalized with acute decompensated CHF

The Worcester Heart Failure Study

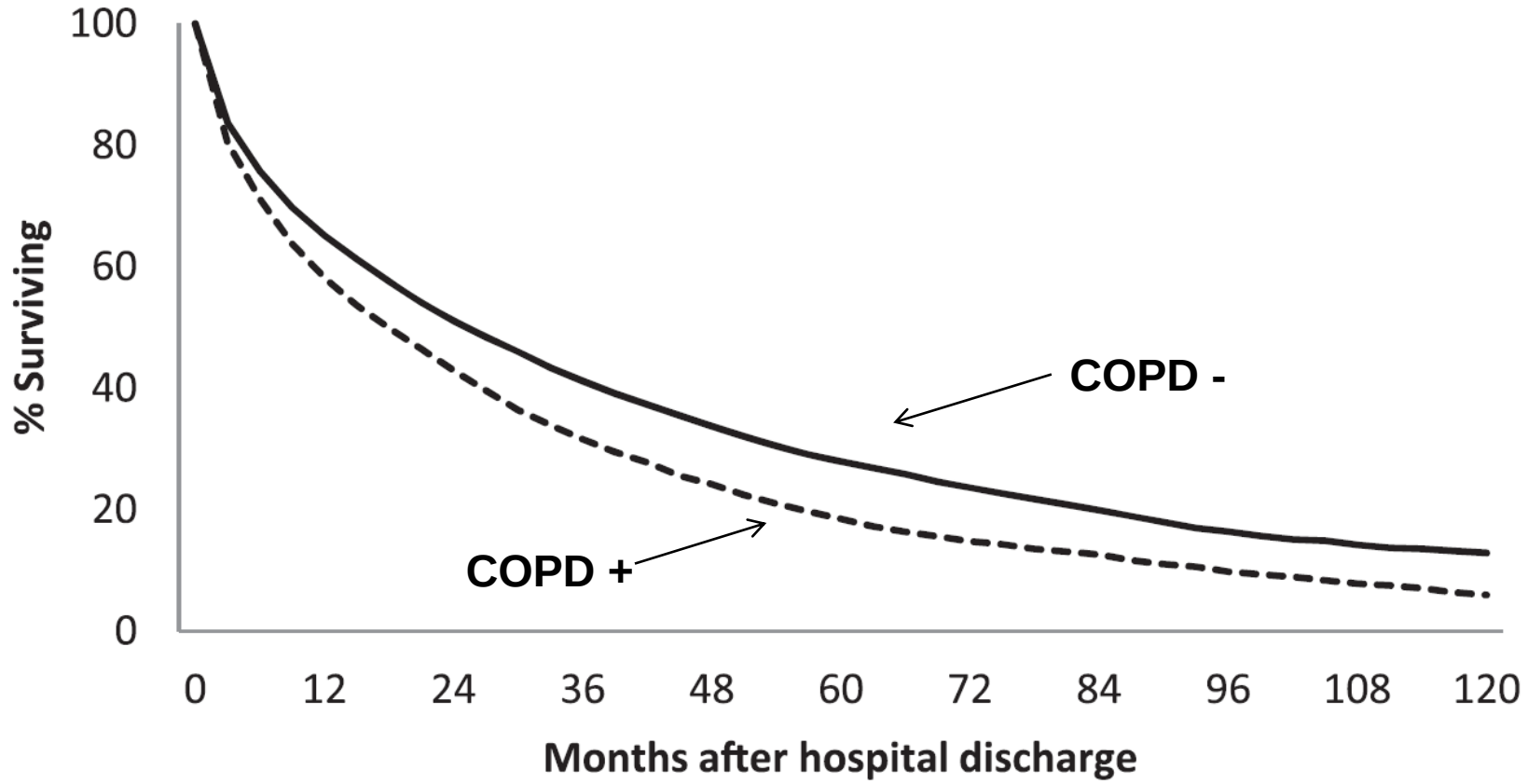
In-hospital and post-discharge death rates of patients hospitalized with acute decompensated heart failure according to history of COPD

Mortality	With COPD	Without COPD
In-hospital	277 (7.9)	427 (6.8)
30-d postdischarge	309 (9.6)	443 (7.6)
1-y postdischarge	1,348 (41.8)	2,031 (34.9)
5-y postdischarge	2,626 (81.5)	4,190 (72.0)

Fisher KA et al., Chest 2015

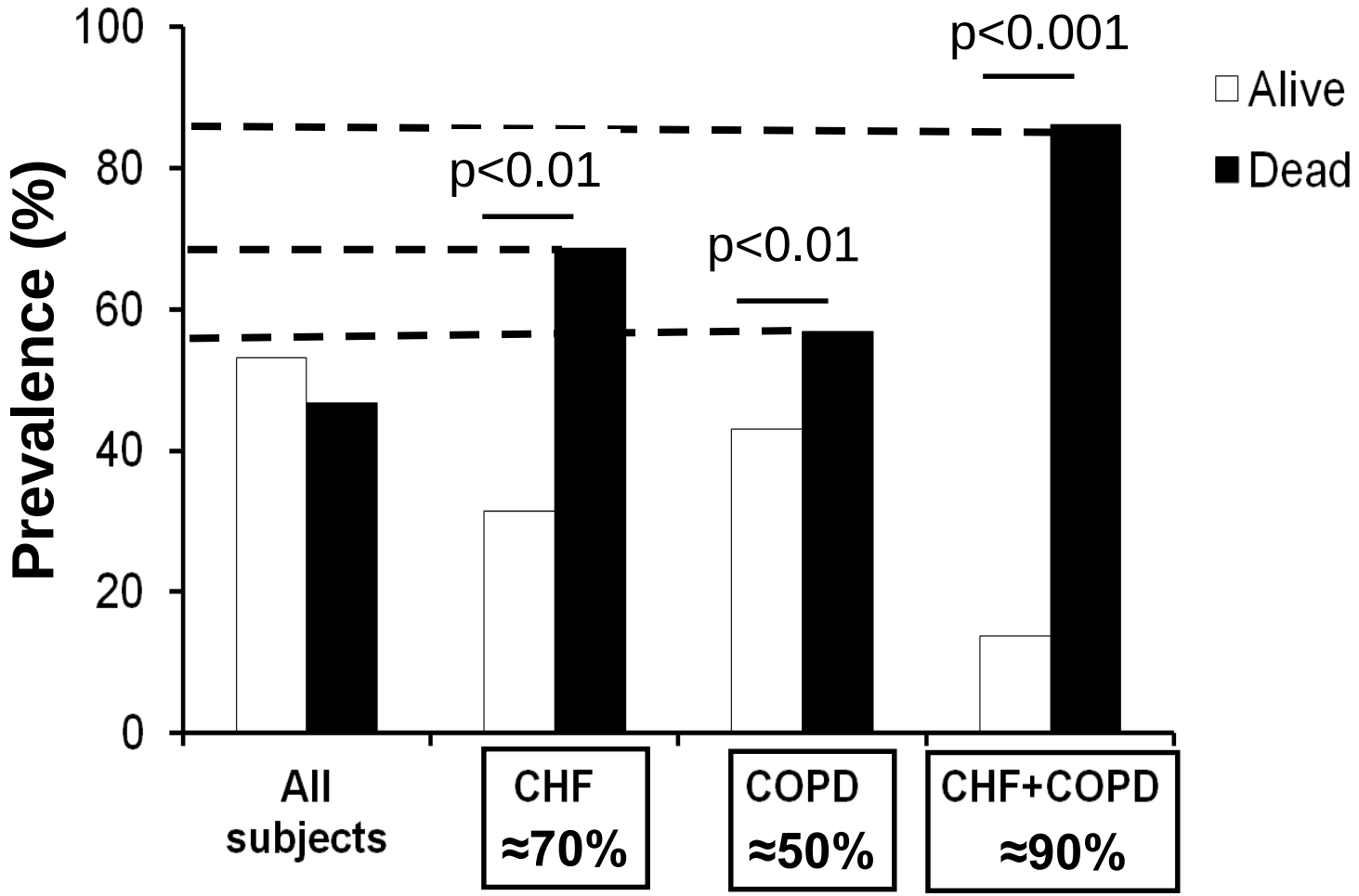
Impact of COPD on the mortality and treatment of patients hospitalized with acute decompensated CHF

The Worcester Heart Failure Study

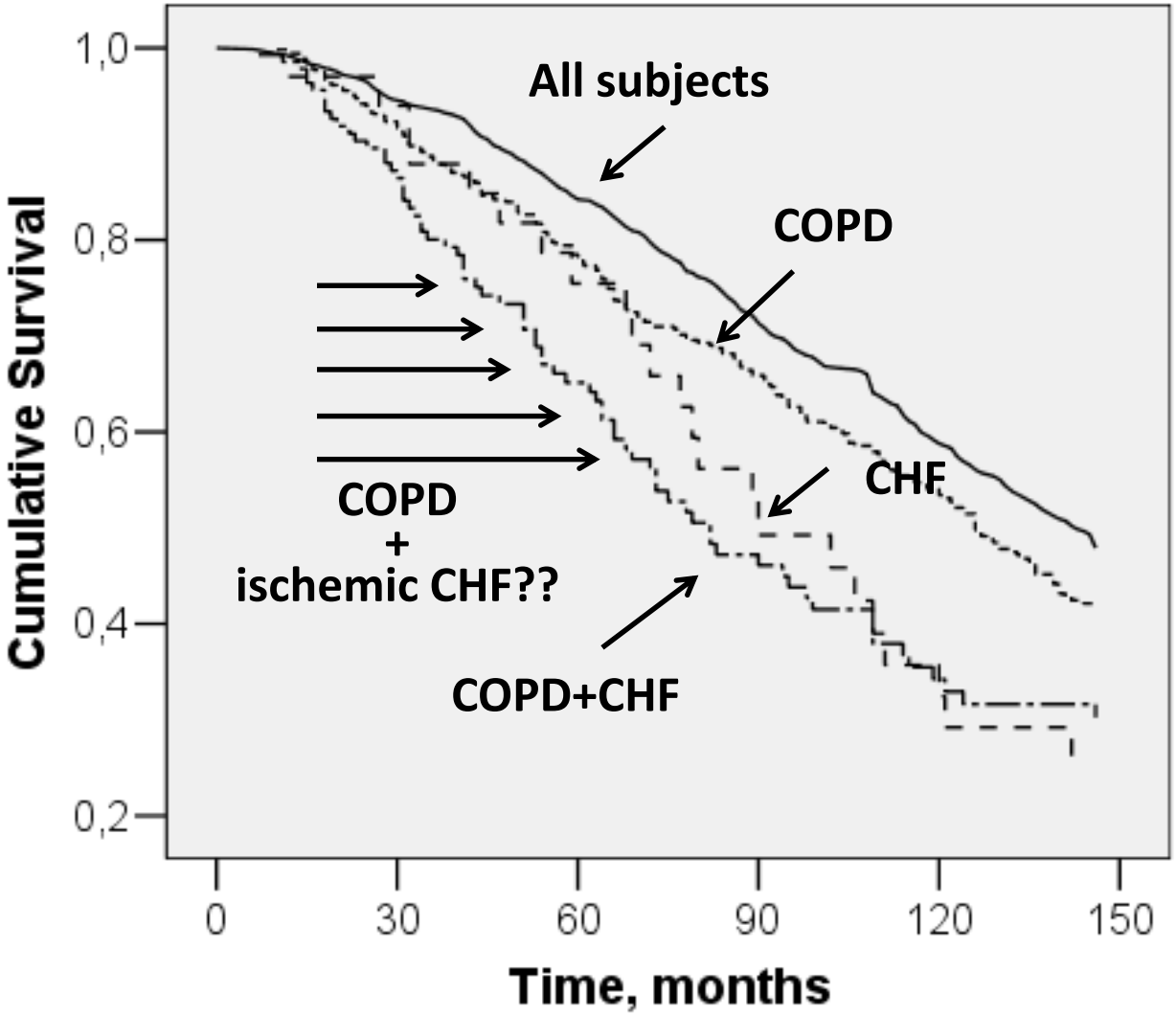


Fisher KA et al., Chest 2015

Chronic obstructive pulmonary disease and long-term mortality in elderly subjects with chronic heart failure

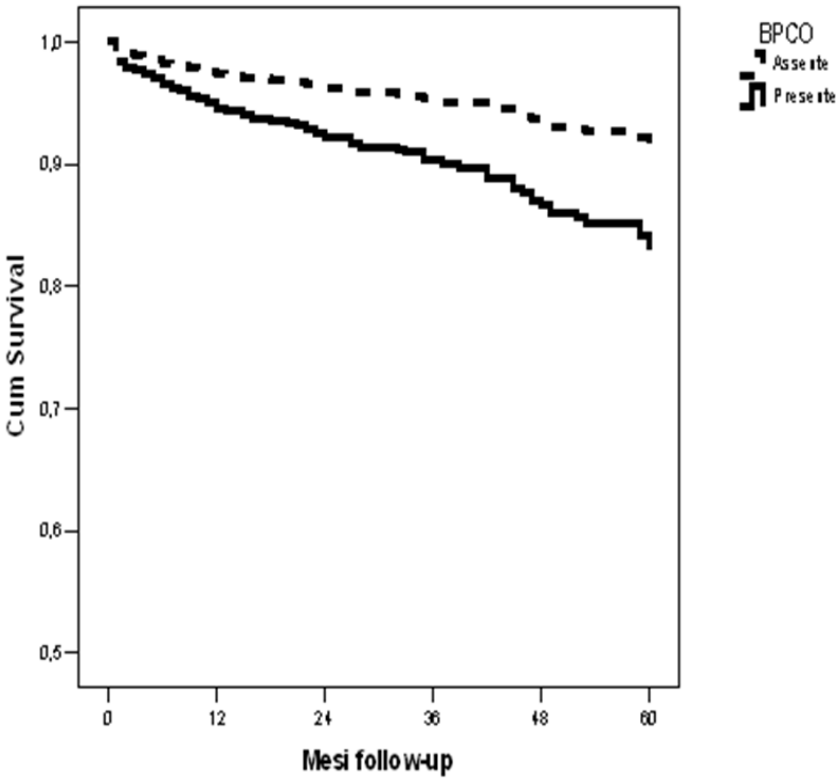


Chronic obstructive pulmonary disease and long-term mortality in elderly subjects with chronic heart failure



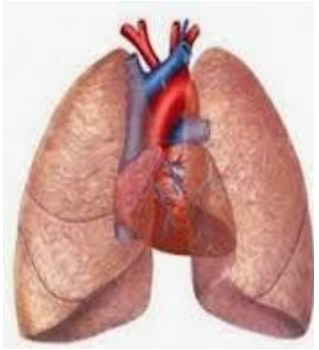
COPD worsens mortality in patients with CABG

Variables	HR	95,0% CI		p
Age	0.997	0.970	1.024	0.823
Sex (F)	0.675	0.358	1.274	0.225
6MWT	0.994	0.992	0.996	0.000
EF	0.955	0.934	0.976	0.000
COPD	2.106	1.321	3.358	0.002



Cacciatore F, AIPO 2015

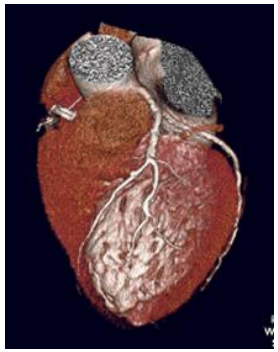
Airways obstruction



Beta-blockers

LABA-LAMA

Cardiac funtion



LABA-LAMA

Beta-blockers

Beta Blockers in HF-COPD

BMJ

RESEARCH

Effect of β blockers in treatment of chronic obstructive pulmonary disease: a retrospective cohort study

Philip M Short, clinical research fellow respiratory medicine,[1] Samuel I W Lipworth, medical student,[2] Douglas H J Elder, clinical research fellow cardiovascular medicine,[3] Stuart Schembri, consultant respiratory physician,[4] Brian J Lipworth, professor of respiratory medicine[1]

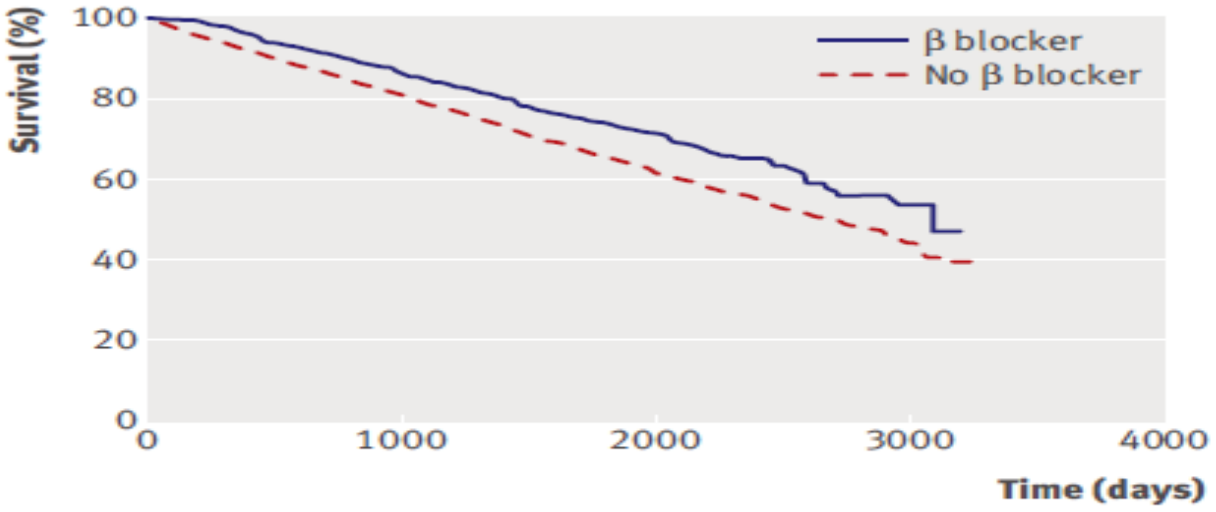


Fig 1 | Kaplan-Meier estimate of probability of survival among patients with COPD by use of β blockers

BMJ

RESEARCH

Effect of β blockers in treatment of chronic obstructive pulmonary disease: a retrospective cohort study

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Table 5 | Risk of death from myocardial infarction and from COPD among patients with COPD by treatment regimen*

Treatment group*	Adjusted hazard ratios (95% CI)†	
	Death from myocardial infarction (n=288)	Death from COPD (n=625)
ICS+LABA+Tio+BB	0.25 (0.11 to 0.58)	0.39 (0.20 to 0.78)
ICS+LABA+Tio	0.44 (0.31 to 0.62)	0.30 (0.24 to 0.38)
ICS+LABA+BB	0.49 (0.27 to 0.90)	0.23 (0.09 to 0.64)
ICS+LABA	0.53 (0.37 to 0.76)	0.52 (0.40 to 0.68)
ICS+BB	0.46 (0.19 to 1.13)	0.25 (0.06 to 0.99)
ICS	0.80 (0.51 to 1.27)	0.45 (0.32 to 0.65)
ICS +Tio	0.63 (0.29 to 1.37)	0.39 (0.25 to 0.61)
LABA or Tio (no ICS)+BB	0.54 (0.25 to 1.16)	0.38 (0.12 to 1.20)
LABA or Tio (no ICS)	1.09 (0.66 to 1.81)	0.42 (0.30 to 0.60)
BB (no ICS)	0.67 (0.41 to 1.10)	0.88 (0.32 to 2.38)

*Treatments: ICS=inhaled corticosteroid, BB=β blocker, LABA=long acting β agonist, Tio=tiotropium.
†Adjusted hazard ratios relative to the control group, which received only treatment with short acting β agonists or antimuscarinic agent. Covariates used in Cox regression model were history of cardiovascular and respiratory disease, age, sex, smoking, history of diabetes, and deprivation.

BMJ

RESEARCH

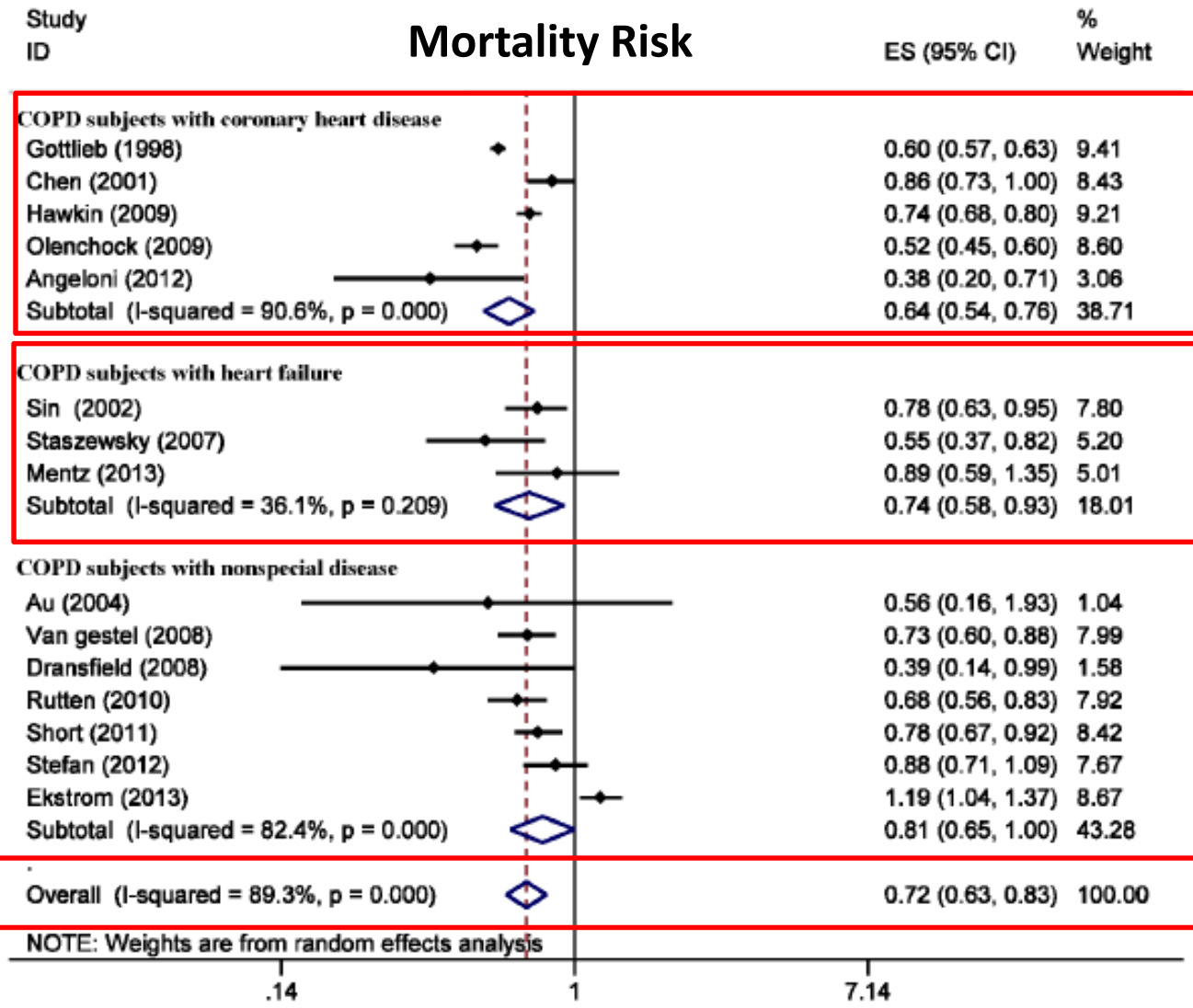
Effect of β blockers in treatment of chronic obstructive pulmonary disease: a retrospective cohort study

Philip M Short, clinical research fellow respiratory medicine,[1] Samuel I W Lipworth, medical student,[2] Douglas H J Elder, clinical research fellow cardiovascular medicine,[3] Stuart Schembri, consultant respiratory physician,[4] Brian J Lipworth, professor of respiratory medicine[1]

- β blockers (predominantly cardioselective) reduced mortality and COPD exacerbations when added to stepwise inhaled therapy for COPD (including long acting β agonists and antimuscarinics) in addition to the benefits attributable to addressing cardiovascular risk

- The benefits observed occurred without adverse effects on pulmonary function

- These data support the use of β blockers in patients with COPD



- 36 %

- 26 %

- 28 %

Published: November 26, 2014

Possible mechanisms involved in beta-blockers protection in COPD - 1

- Anti-hypertensive effect
- Arrhythmic-risk reduction
- Myocardial perfusion improvement
- Modulation of sympathetic nervous system
- Reduction in heart and respiratory rates, and ventilatory dead space
- Decreased exercise induced vasodilatation in skeletal muscles
- Loss of muscle fibers
- Impaired endothelial function
- Heart rate reduction

Possible mechanisms involved in beta-blockers protection in COPD - 2

In animal:

- ß-blockers have a protective effect on airway responsiveness to methacholine
- ß- blockers not only reduced the inflammatory cells in the bronchoalveolar lavage of antigen challenged mice, but also reduced the levels of cytokines, such as IL-13, IL-10, IL-5, and TGF-b1
- ß- blockers chronic treatment produced a marked time-dependent decrease in goblet cells and mucin content of the airway epithelium
- ß- blockers up-regulate beta2-receptors in the lung and thus improve the effectiveness of bronchodilators #

In humans:

- chronically titrating doses of ß- blockers in asthma patients reduced airway hyper-responsiveness

Lin R, et al. (2008) Changes in beta 2- adrenoceptor and other signaling proteins produced by chronic administration of ‘‘beta-blockers’’ in a murine asthma model. Pulm Pharmacol Ther 21: 115–24.

Heart

Underuse of β-blockers in heart failure and chronic obstructive pulmonary disease

Brian Lipworth, Derek Skinner, Graham Devereux, Victoria Thomas, Joanna Ling Zhi Jie, Jessica Martin, Victoria Carter and David B Price

Heart published online July 5, 2016

What is already known on this subject?
Current guidelines recommend the use of cardioselective β-blockers for heart failure (HF) in patients with chronic obstructive pulmonary disease (COPD). However, primary and secondary care physicians still remain reticent to prescribe β-blockers because of concerns regarding potential bronchoconstriction, especially in more severe patients.

What might this study add?
The results of this study showed that the use of β-blockers in conjunction with ACE inhibitor (ACEI)/angiotensin-2 receptor blocker (ARB) was significantly lower in patients with HF and COPD than in patients with HF alone, irrespective of the severity of COPD.

How might this impact on clinical practice?
There is an unmet need in terms of underuse of β-blockers in patients with HF and COPD, in turn suggesting that prospective randomised controlled trials are required to determine the benefit–risk ratio of β-blockers in such patients.

Heart

Underuse of β-blockers in heart failure and chronic obstructive pulmonary disease

Brian Lipworth, Derek Skinner, Graham Devereux, Victoria Thomas, Joanna Ling Zhi Jie, Jessica Martin, Victoria Carter and David B Price

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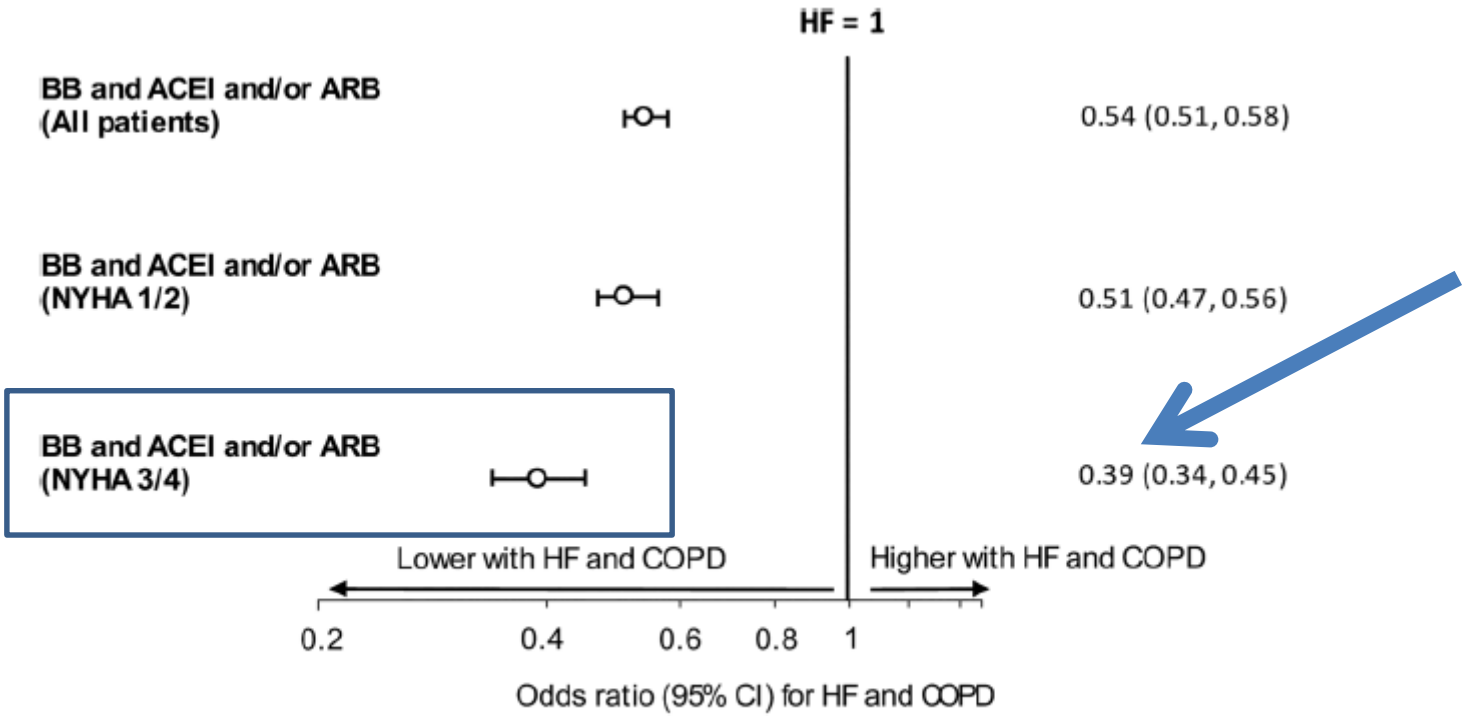


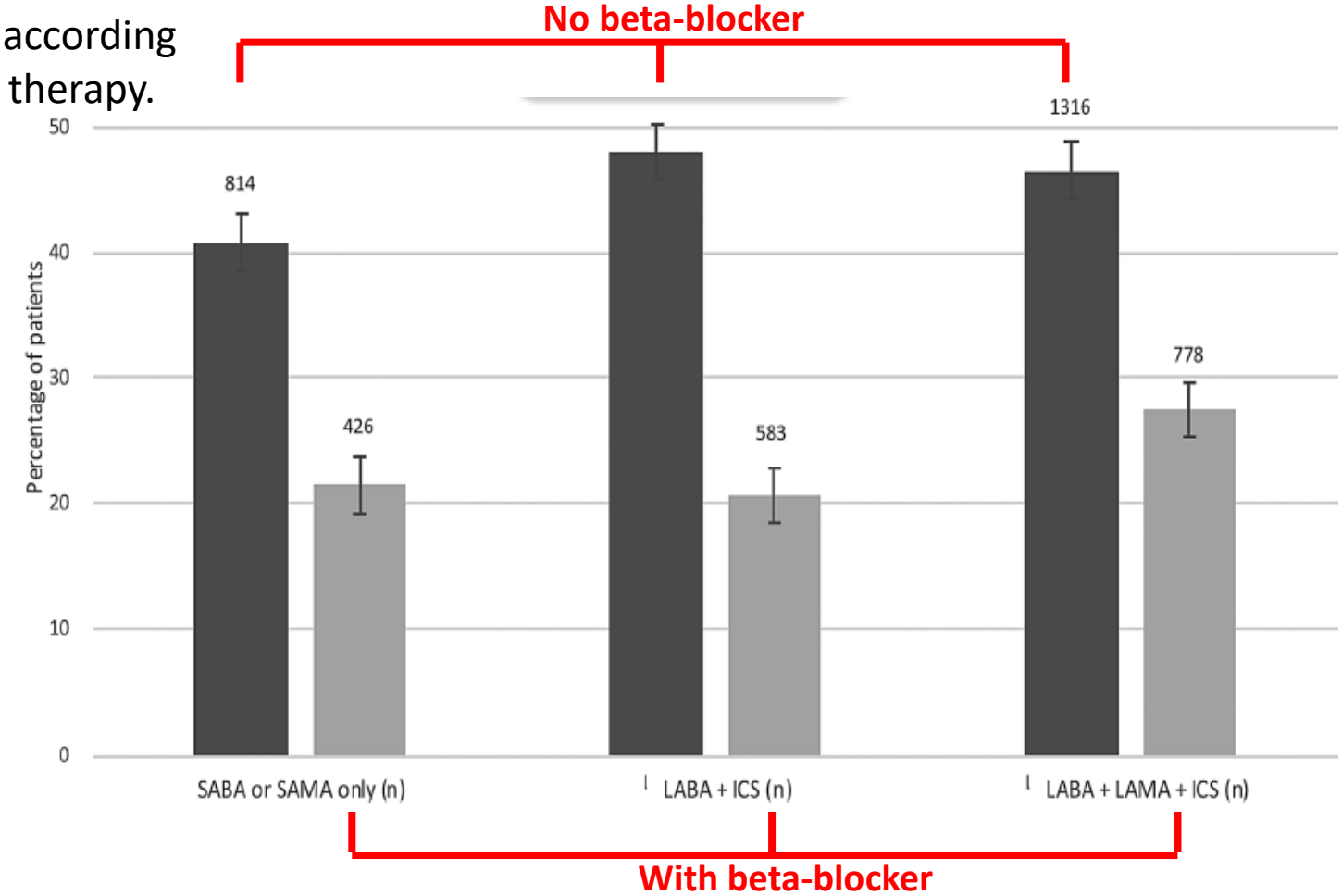
Heart

Underuse of β-blockers in heart failure and chronic obstructive pulmonary disease

Brian Lipworth, Derek Skinner, Graham Devereux, Victoria Thomas, Joanna Ling Zhi Jie, Jessica Martin, Victoria Carter and David B Price

Heart published online July 5, 2016

Use of β-blockers in COPD/HF according to inhaler therapy.



Impact of COPD on the mortality and treatment of patients hospitalized with acute decompensated CHF

The Worcester Heart Failure Study

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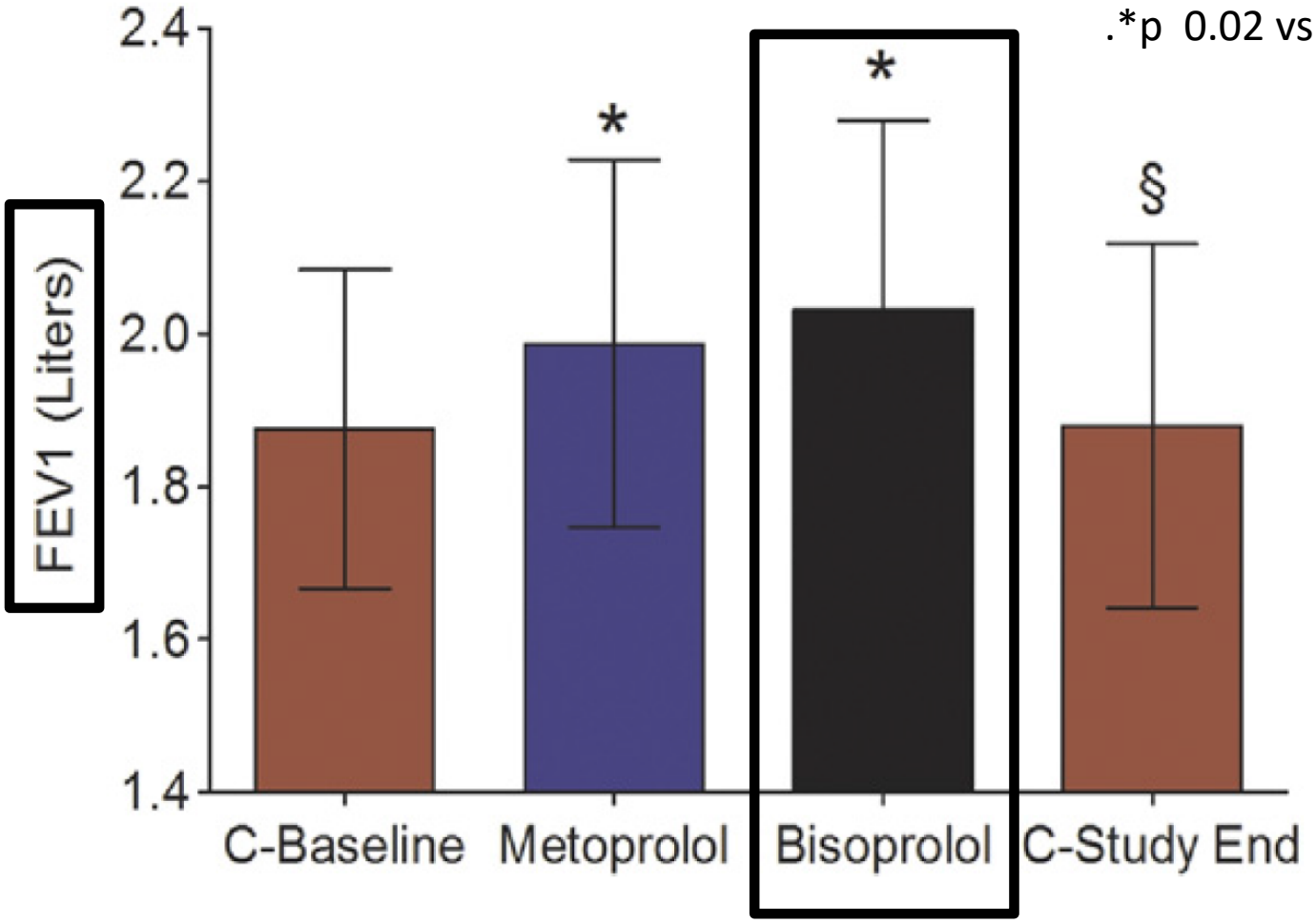
*Changes in discharge "**β-BLOCKERS"** therapy according to history of COPD,*

…but, what type of β-blocker should be used?

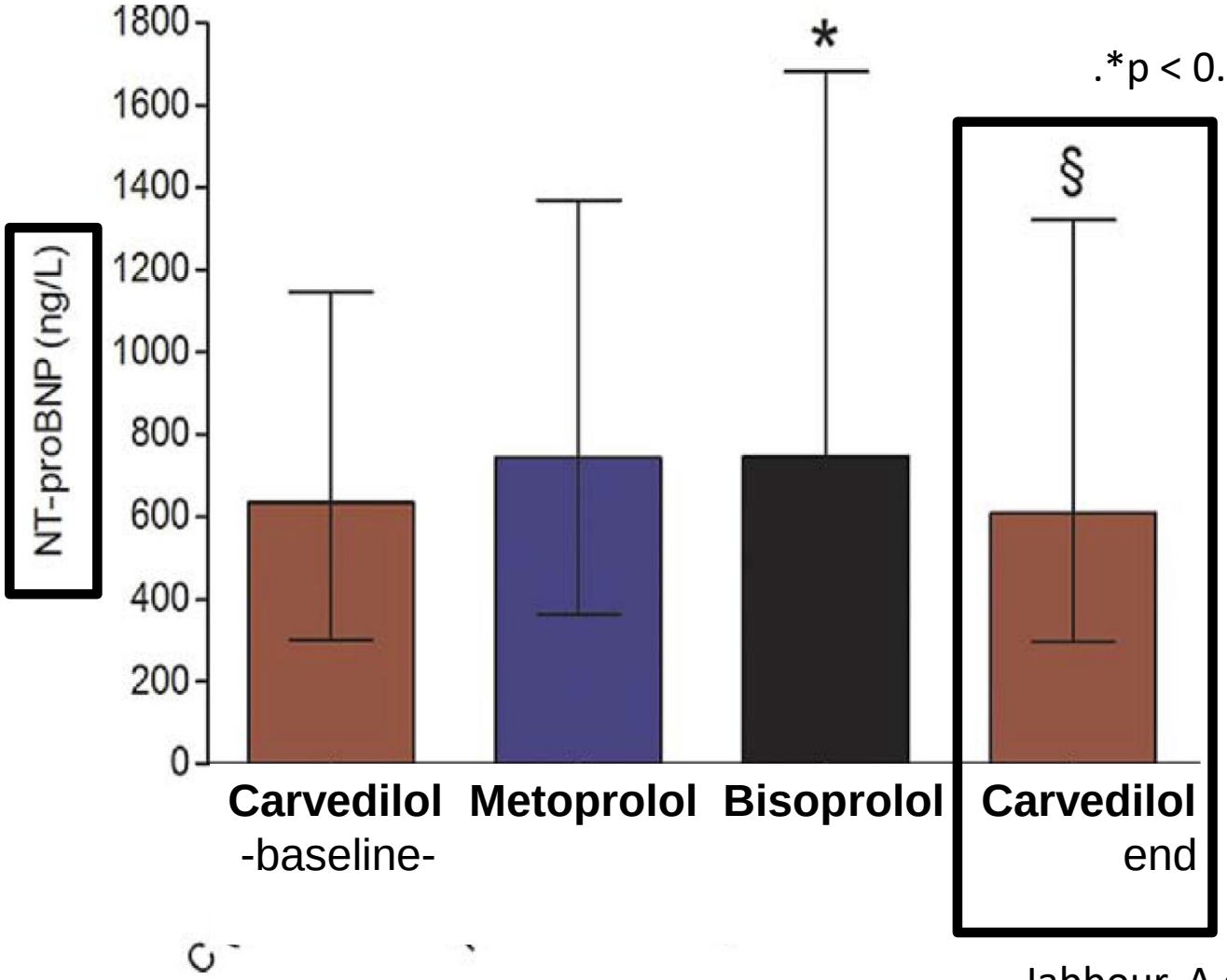
Fisher KA et al., Chest 2015

Differences Between Beta-Blockers in Patients With Chronic Heart Failure and Chronic Obstructive Pulmonary Disease



Jabbour, A et al., JACC 2010

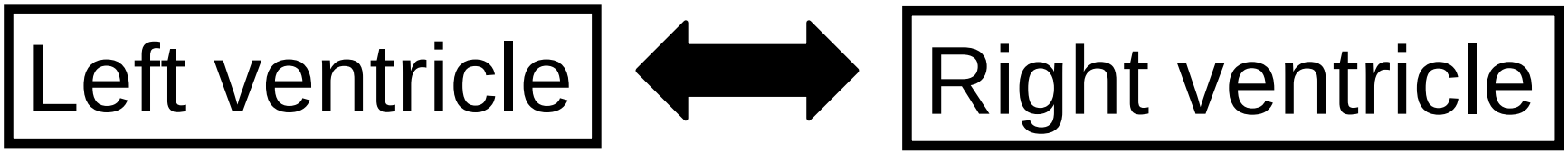
Differences Between Beta-Blockers in Patients With Chronic Heart Failure and Chronic Obstructive Pulmonary Disease



.*p < 0.02 vs. baseline

Jabbour, A et al., JACC 2010

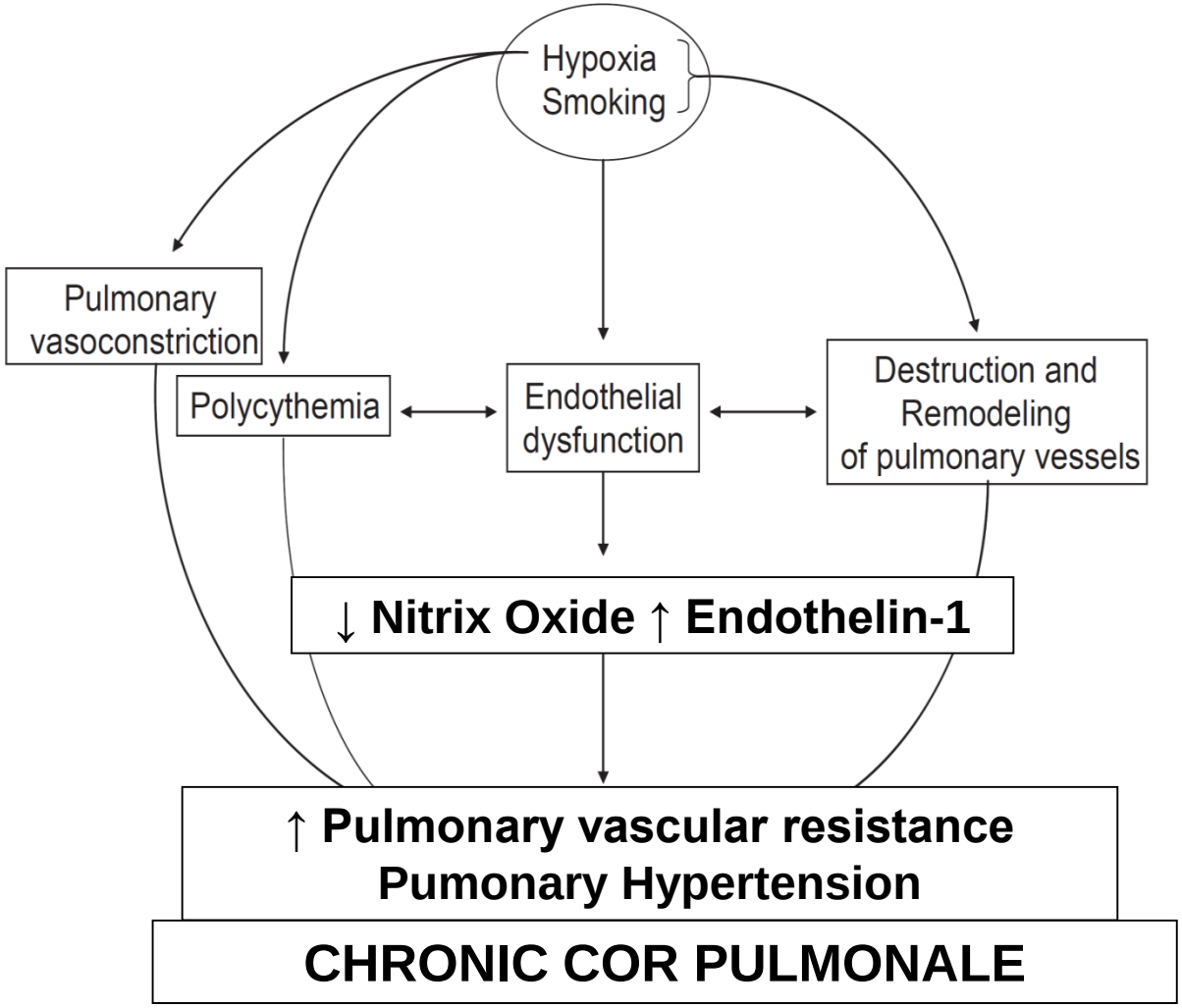
Different assumptions on the mechanisms of association between abnormal lung function and chronic heart failure have been made.



Left ventricle → mechanisms

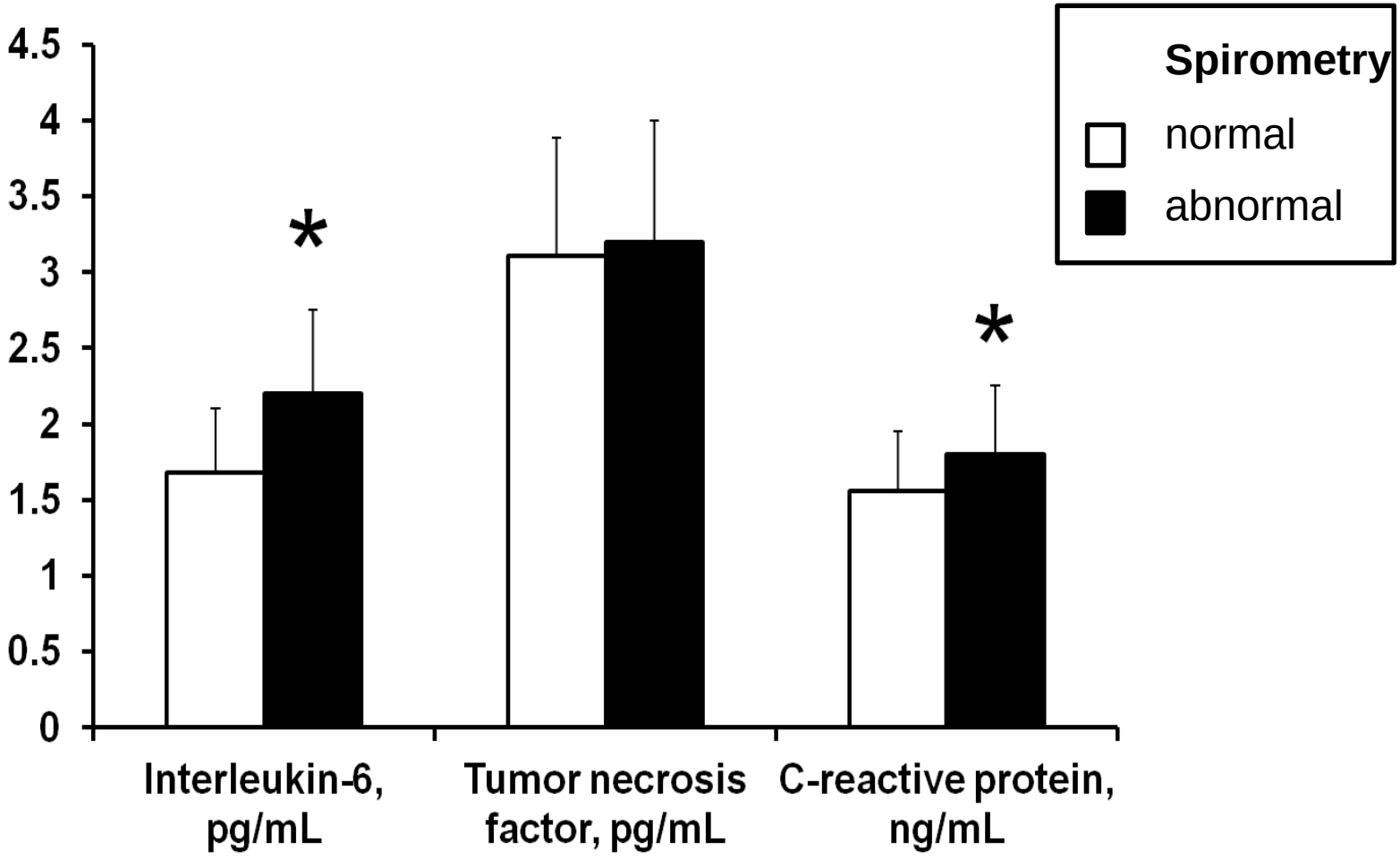
- Low-grade systemic inflammation
- Impaired respiratory function is associated to oxidative stress that may make directly vulnerable cardiac muscle.
- Changes in respiratory mechanics and in intra-thoracic pressure can reduce cardiac output by acting on pre- and afterload

Right ventricle ➡ mechanisms



Lung Function and Risk for Heart Failure Among Older Adults: The Health ABC Study

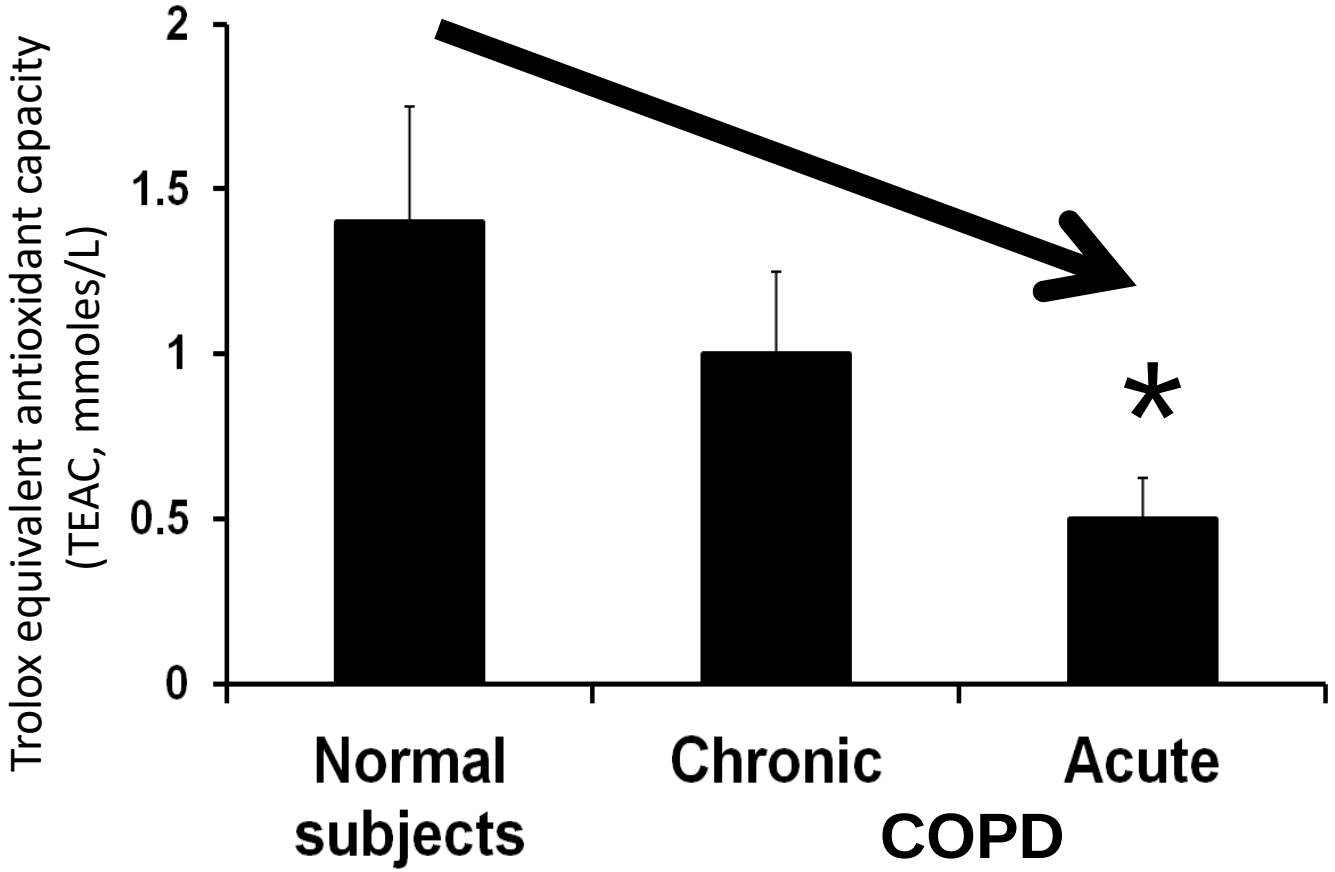
Inflammatory markers



*p<0.05 vs normal

Georgiopoulou, VV et al., . Am J Med 2011

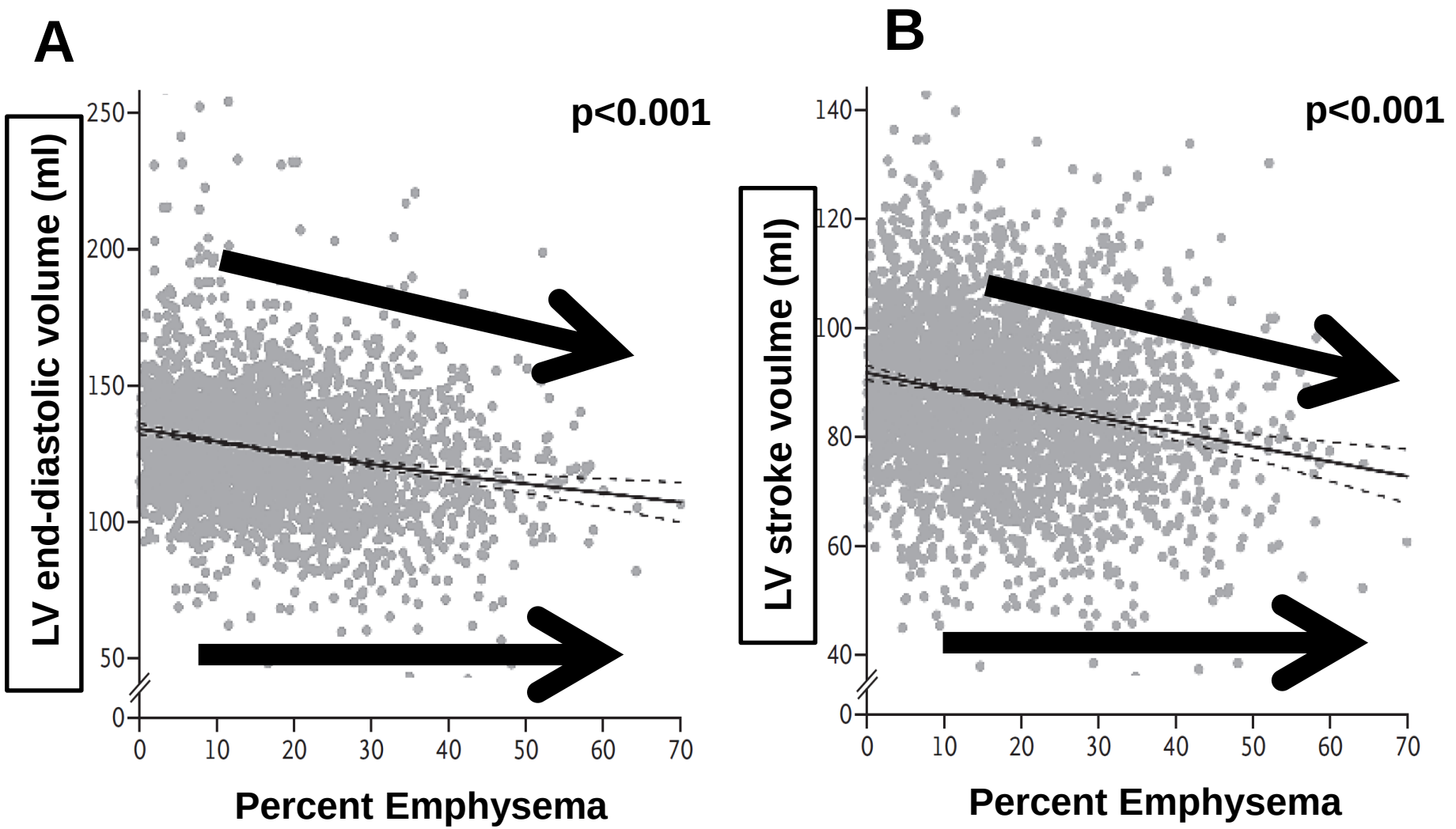
Systemic Oxidative Stress in Chronic Obstructive Pulmonary diseases (COPD)



*p<0.01 vs normal subjects

Morrison R et al., Am J Respir Crit Care Med 1996

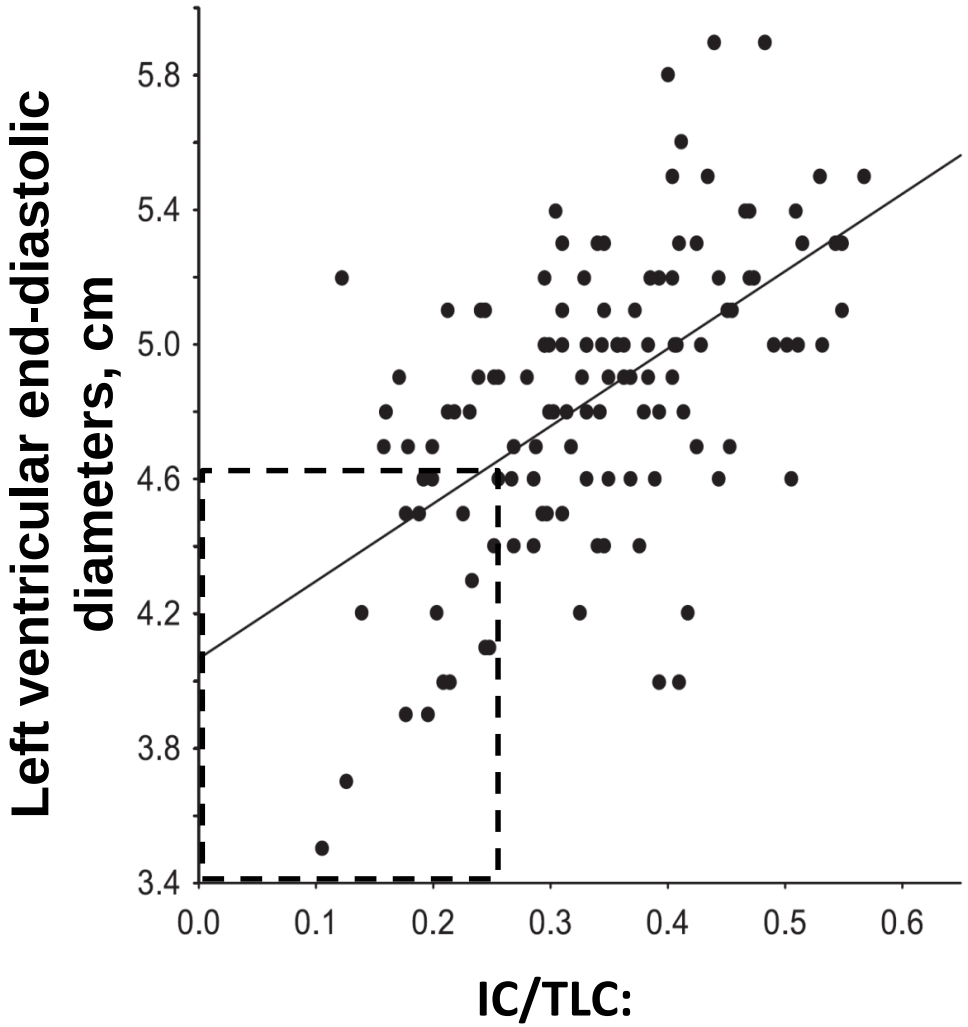
Relationship between percent emphysema and left ventricular end-diastolic (A) and stroke volume (B)



Barr G et al., N Engl J Med 2010

Decreasing Cardiac Chamber Sizes and Associated Heart Dysfunction in COPD

Role of "Hyperinflation"



IC/TLC: inspiratory-to-total lung capacity ratio <0.25 had a significantly impaired left ventricular diastolic filling pattern

Watz H et al., Chest 201

Heart-Lung Interaction in a Model of COPD: The Importance of Lung Volume and Direct Ventricular Interaction

dynamic lung hyperinflation (DH)	expiratory resistive loading to cause dynamic hyperinflation
increased pulmonary vascular resistance (PVR)	normobaric-hypoxia to increase PVR
large increases in negative intrathoracic pressure (nITP).	inspiratory resistive loading of -20 cmH2O

COPD	LV Stroke Volume	LV end-diastolic volume	Septal Flattening Direct ventricular Interaction
negative intrathoracic pressure	↓ 7 ± 7 %	↓4±5 %	present
dynamic lung hyperinflation	↓ 12±13%	↓ 9±10%	present
DH + nITP	↓ 16±16%	↓ 12±10%	Present and greater effect than alone
Addition of hPVR to nITP+DH	not further	reduce LV volumes	

The interaction of nITP and DH reduces LV filling through DVI. However, DH may be more detrimental to LV hemodynamics than nITP, likely due to mediastinal constraint of the heart amplifying DVI.

WS Cheyne, et al American Journal of Physiology - Heart and Circulatory Physiology 7 October 2016

Cardiac effects of current treatments of chronic obstructive pulmonary disease

COPD trial paradox

Lahouse et al, The Lancet, 2016

Cardiovascular mortality in mild to moderate COPD

10% ↓ in FEV_1

28%↑cardiovascular mortality

20% ↑ non-fatal coronary event

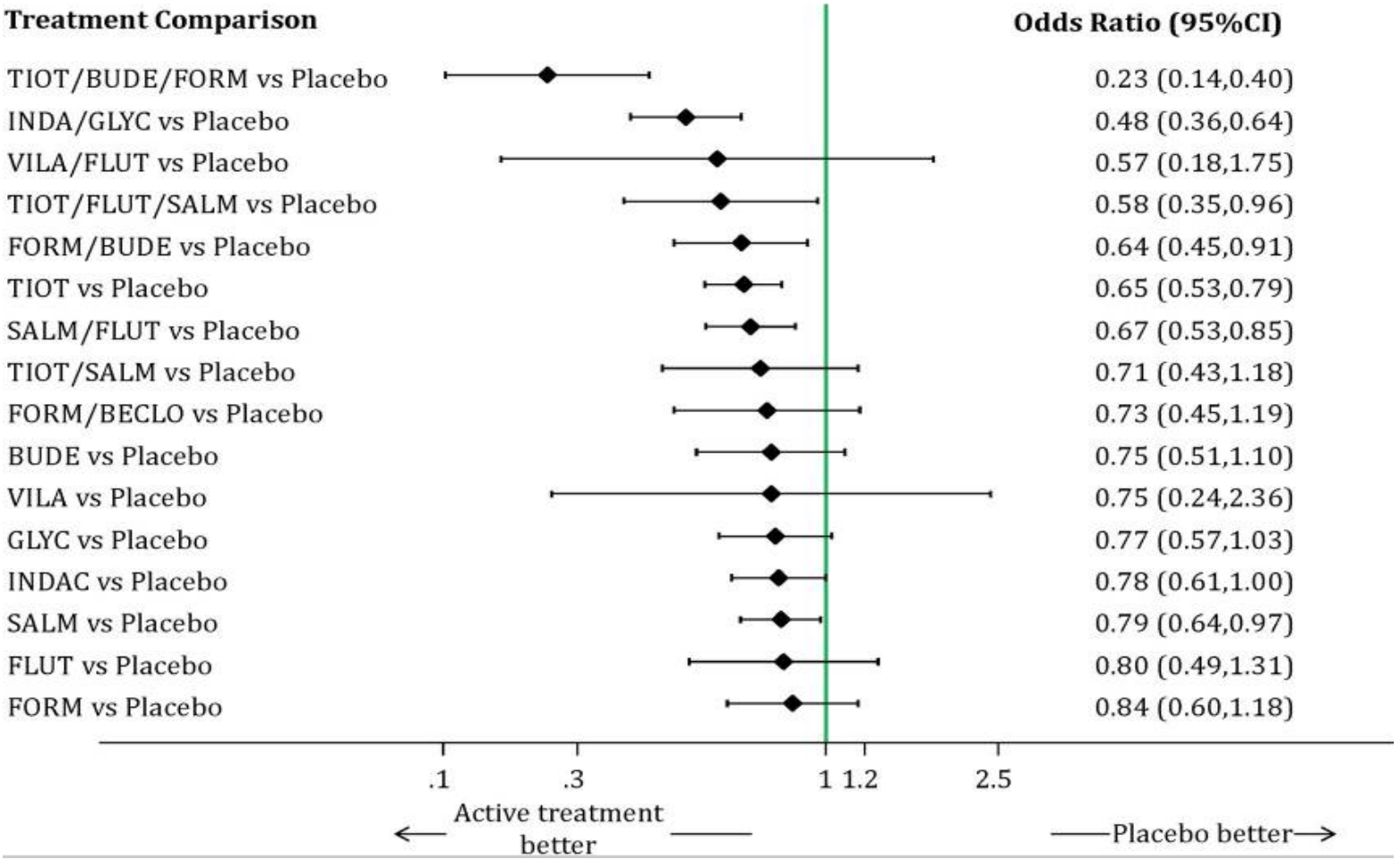
Anthonisen et al, Am J Respir Crit Care Med 2002

LABA – LAMA COPD/HF: warnings

- The beta2-agonists, while exerting relatively selective action on beta2-adrenergic receptors, have generated some concerns because of certain adverse effects that can produce, especially in patients with ischemic heart disease:

1. possible induction of arrhythmias, for the stimulation of cardiac beta-adrenergic receptors;
2. activation of adrenergic mechanisms, subsequent to a peripheral vasodilatation;
3. down-regulation of ß2 receptors in the myocardium, with a consequent accentuated consumption of oxygen and an increased production of catecholamines;
4. potential deterioration of HF by induction or accentuation of left ventricular systolic dysfunction
5. induction of hypokalemia;

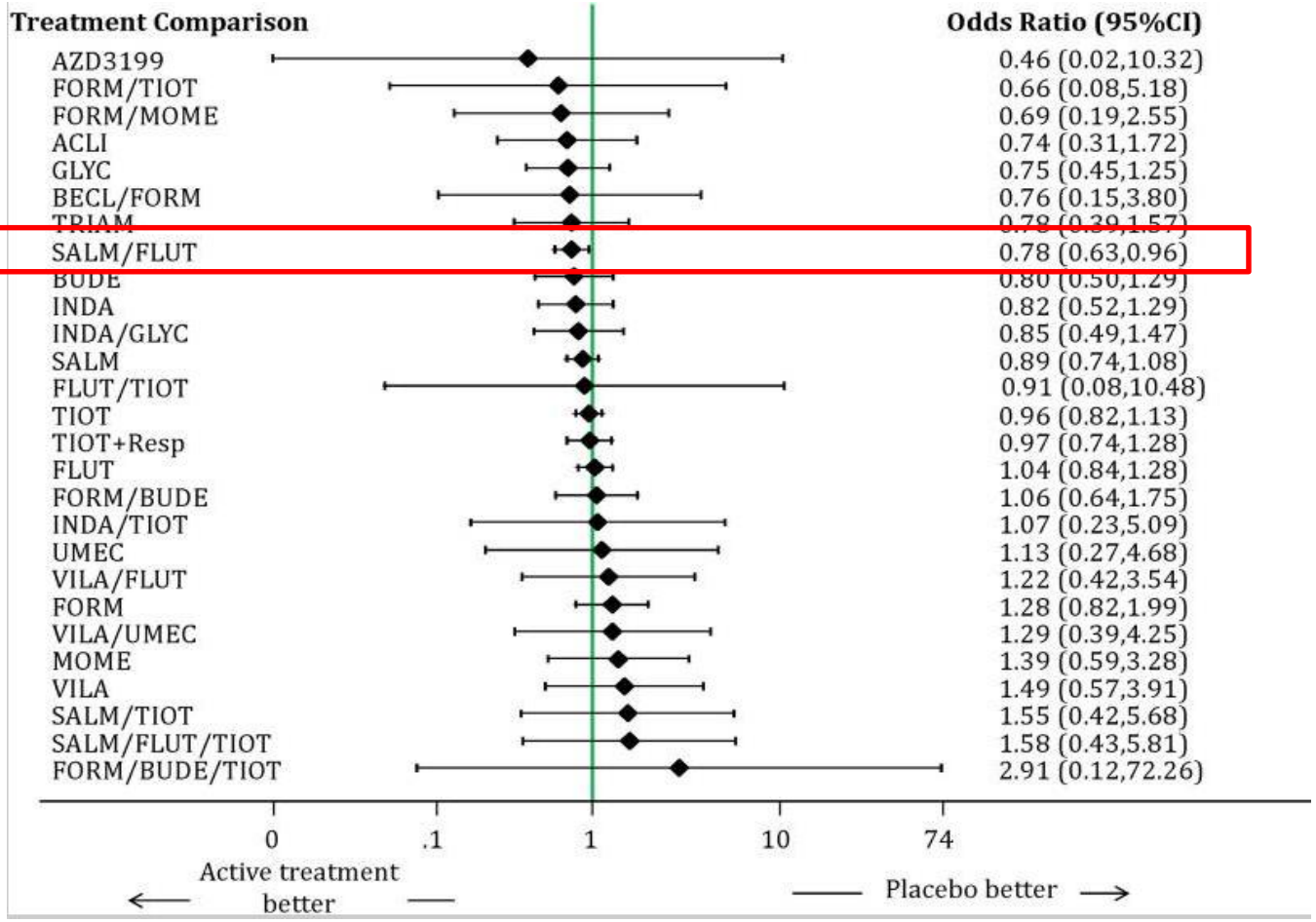
Moderate-to-severe exacerbations for patients who experienced an exacerbation in the past year



Comparative safety and effectiveness of long-acting inhaled agents for treating chronic obstructive pulmonary disease: a systematic review and network meta-analysis

Tricco AC, BMJ 2015

Mortality network meta-analysis forest plot for treatments compared to placebo



Comparative safety and effectiveness of long-acting inhaled agents for treating chronic obstructive pulmonary disease: a systematic review and network meta-analysis

Tricco AC, BMJ 2015

Comparative safety and effectiveness of long-acting inhaled agents for treating chronic obstructive pulmonary disease: a systematic review and network meta-analysis

- We found no statistically significant differences in risks of serious arrhythmia across any of the compared agents in our rapid review.
- This finding is clinically important as clinicians have raised concerns about increasing risk of arrhythmia with use of LABA

Tricco AC, BMJ 2015

Original Investigation

Cardiovascular Safety of Inhaled Long-Acting Bronchodilators in Individuals With Chronic Obstructive Pulmonary Disease

Andrea Gershon, MD, MS; Ruth Croxford, MSc, PStat; Andrew Calzavara, MSc; Teresa To, PhD; Matthew B. Stanbrook, MD, PhD; Ross Upshur, MD, MSc; Thérèse A. Stukel, PhD

JAMA Internal Medicine July 8, 2013 Volume 173, Number 13

Table 6. Bronchodilator Class and Risk of Hospitalization or ED Visit for Cardiovascular Events

Cardiovascular Event	Matched Cases With Cardiovascular Outcome as First Event, %	OR (95% CI)				
		New Use of LAAs[a]		New Use of LABAs[a]		New Use of LABAs vs LAAs, Adjusted[c]
		Matched[b]	Adjusted[c]	Matched[b]	Adjusted[c]	
ACS, including acute MI						
Cases	35.5	1.32 (1.08-1.61)	1.30 (1.04-1.62)	1.23 (0.96-1.56)	1.43 (1.08-1.89)	1.10 (0.78-1.56)
P value		.006	.02	.10	.01	.58
Heart failure						
Cases	29.1	1.32 (1.11-1.58)	1.31 (1.08-1.60)	1.48 (1.17-1.86)	1.42 (1.10-1.83)	1.08 (0.79-1.47)
P value		.002	.006	.001	.008	.64
Arrhythmias						
Cases	16.3	1.21 (0.91-1.61)	1.26 (0.91-1.75)	1.17 (0.79-1.73)	1.17 (0.74-1.83)	0.93 (0.54-1.59)
P value		.19	.17	.43	.50	.77
Ischemic stroke						
Cases	19.1	0.73 (0.55-0.96)	0.68 (0.50-0.91)	1.05 (0.74-1.50)	1.17 (0.78-1.74)	1.73 (1.06-2.83)
P value		.02	.01	.77	.58	.03

Abbreviations: ACS, acute coronary syndrome; ED, emergency department; LAA, long-acting anticholinergic; LABA, long-acting β-agonist; MI, myocardial infarction; OR, odds ratio.

[a] Reference group consists of nonusers of LABAs or LAAs.

[b] Indicates taking only matching into account.

[c] Indicates taking matching into account and adjusting for all covariates.

Original Investigation

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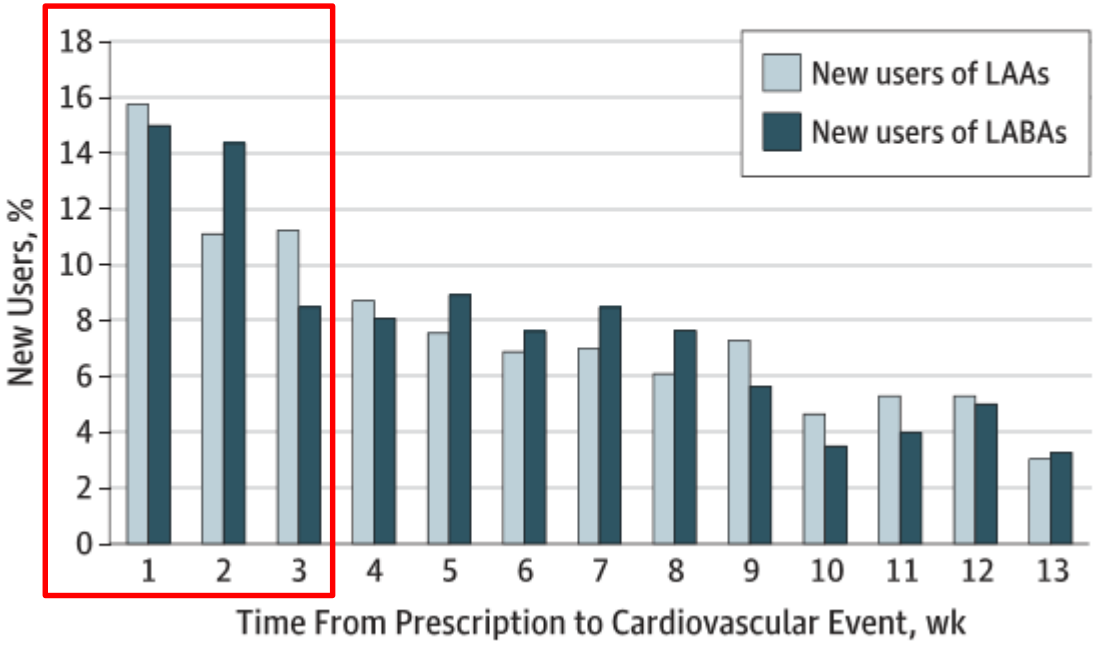
JAMA Internal Medicine July 8, 2013 Volume 173, Number 13

Figure. Percentage of Individuals Experiencing Various Durations of Time From Receipt of an Inhaled Long-Acting β-Agonist (LABA) or Long-Acting Anticholinergic (LAA) to a Cardiovascular Event



Pulmonary Pharmacology & Therapeutics 35 (2015) 42–49

Contents lists available at ScienceDirect

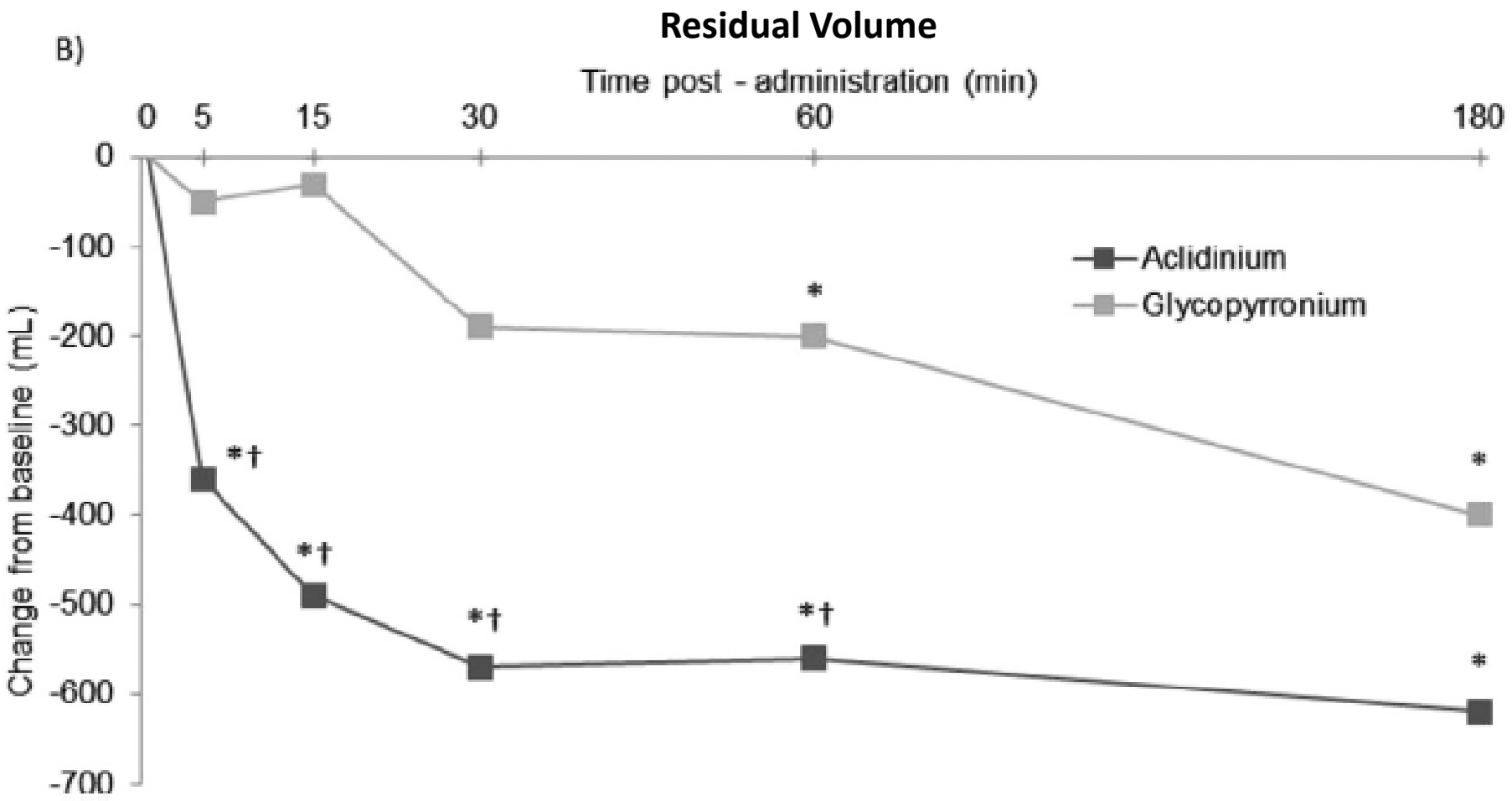
Pulmonary Pharmacology & Therapeutics

journal homepage: www.elsevier.com/locate/ypupt

Faster reduction in hyperinflation and improvement in lung ventilation inhomogeneity promoted by aclidinium compared to glycopyrronium in severe stable COPD patients. A randomized crossover study

Pierachille Santus [a,*], Dejan Radovanovic [a], Fabiano Di Marco [b], Rita Raccanelli [a], Vincenzo Valenti [c], Stefano Centanni [b]

Modificazioni rispetto al basale dell' ITGV del RV durante il trattamento con aclidinio o glicopirronio.

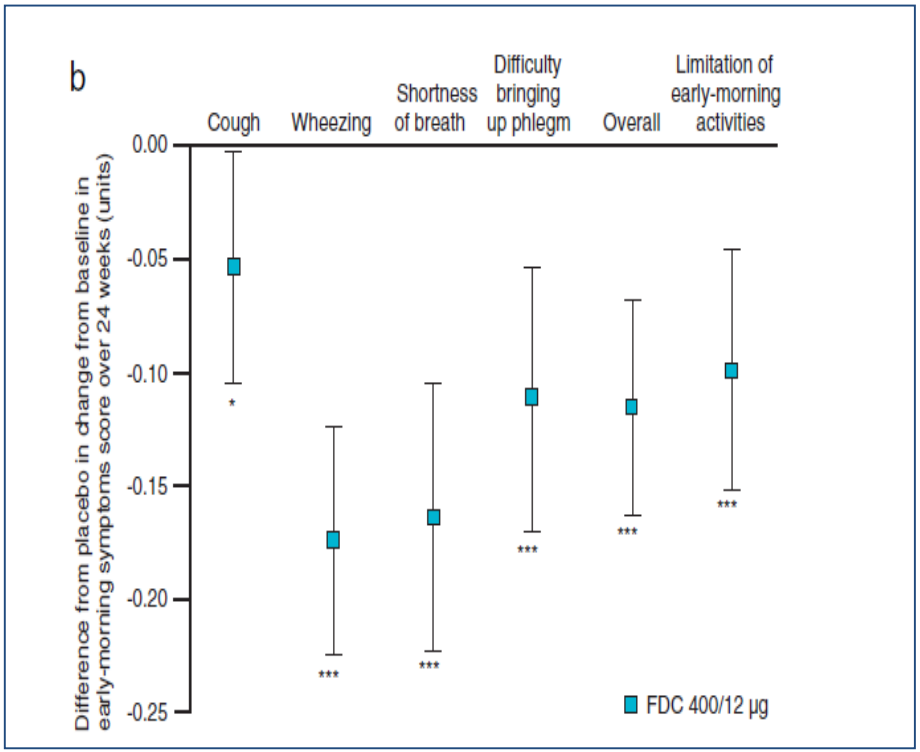


*p <0,05 vs basale; †p <0,05 vs glicopirronio.

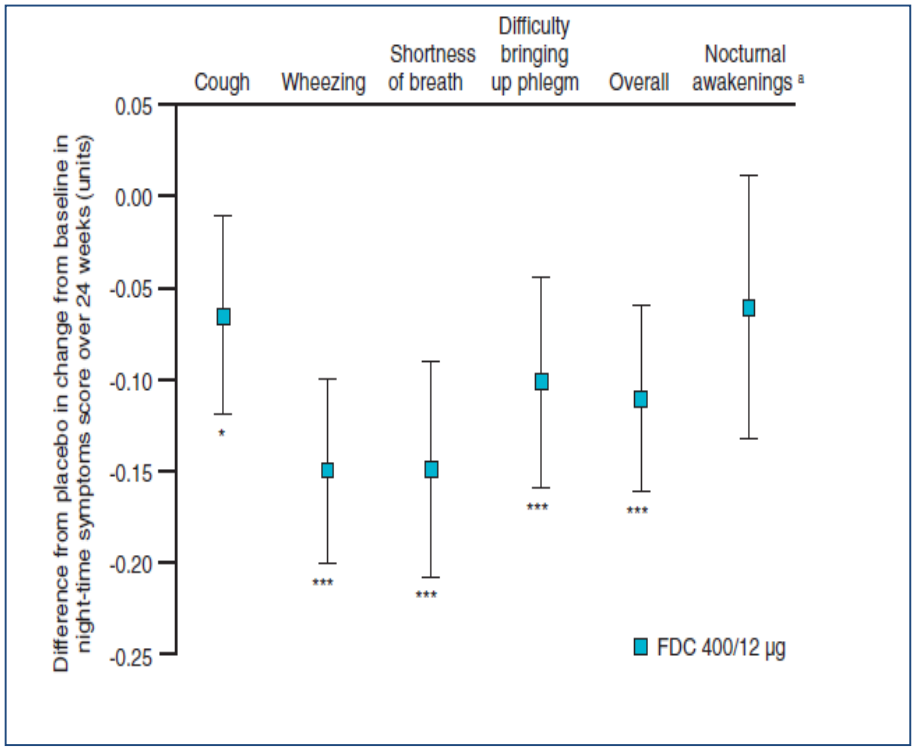
P. Santus et al. / Pulmonary Pharmacology & Therapeutics 35 (2015) 42-49

Pooled Analysis: change from baseline in early-morning and night-time symptom severity over study period

early-morning



night-time



*p < 0.05, ***p < 0.001 vs placebo

Bateman et al. Respiratory Research (2015) 16:92

International Journal of COPD

Dovepress

open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

Effect of indacaterol on lung deflation improves cardiac performance in hyperinflated COPD patients: an interventional, randomized, double-blind clinical trial

Parameter	Indacaterol		
	T0	ΔT60	ΔT180
TAPSE, mm	22.30±3.52	+0.05±1.28*	+0.41±1.07#,*
PAPs, mmHg	33.03±8.10	+0.71±5.50	−0.08±7.76
DT-TR, msec	207.80±64.90	+9.93±36.31*	+11.90±32.86#,*
LVEF, %	61.80±5.25	−0.03±1.90	−0.25±2.20
DT-MR, msec	230.18±58.69	+3.98±38.24	+4.33±38.79
HR, bpm	71.54±10.60	−1.95±5.30#,*	−2.00±6.10#,*

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STATE-OF-THE-ART PAPER

Heart Failure and Chronic Obstructive Pulmonary Disease

The Quandary of Beta-Blockers and Beta-Agonists

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Liverpool and Glasgow, United Kingdom; Modena, Italy; and Gothenburg, Sweden

B_1 blockers and β_2-agonist in patients with COPD and CHF.

It'is time for a clinical trial!!

β blocker use in cardiovascular disease with concurrent COPD

Despite compelling observational data supporting the use of β-blockers in COPD, there are to date no prospective long-term randomised trials looking at either mortality or exacerbations in patients with cardiovascular disease and COPD

Cardiac Effects of Fixed-dose Dual Bronchodilator in Patients With Heart Insufficiency and COPD (CREATES)

This study is currently recruiting participants. (see Contacts and Locations)

Verified June 2016 by RWTH Aachen University

Sponsor:
RWTH Aachen University

Information provided by (Responsible Party):
RWTH Aachen University

ClinicalTrials.gov Identifier:
NCT02812862

First received: June 14, 2016
Last updated: August 8, 2016
Last verified: June 2016
History of Changes

Purpose

The aim of this study is to evaluate the pulmonary and cardiac effects of a LABA / LAMA combination therapy in patients suffering from both chronic heart failure and chronic obstructive pulmonary disease.

The secondary aim of the study it to assess the safety of the LABA / LAMA combination.

Groups/Cohorts	Assigned Interventions
treatment group 50 male and female patients suffering from chronic heart failure and chronic obstructive pulmonary disease. Ultibro/ Breezhaler combination therapy	Drug: Ultibro/ Breezhaler LABA/ LAMA combination therapy a combination of two bronchodilators acting on two separate pharmacological targets - one ß-agonist and one anti-muscarinergic agent Other Names: • Long-acting ß-agonist (LABA) • Long-acting anti-muscarinergic agent (LAMA)
control group 50 male and female patients suffering from chronic heart failure but not COPD and NOT receiving LAMA/ LABA	

Conclusions

- The β-blockers use is safe and reduce mortality and exacerbations in COPD/HF patients.

- LABA and LAMA use is safe and reduce mortality and exacerbations in COPD.

- Initiating treatment with β-blockers in HF and COPD is not simple.

- It requires careful initial dose titration over a period of weeks, along with monitoring of heart rate, supine and standing blood pressure and spirometry. Moreover, β-blockers tend to be less well tolerated in older patients with comorbidities, such as diabetes, peripheral vascular disease and renal impairment, who are more prone to postural hypotension.

- Long-term randomised controlled trials looking at either mortality or exacerbations in patients with HF and COPD are necessary to overcome the controversia on protective effect of β-blockers – LAMA and LABA in patients with COPD and HF

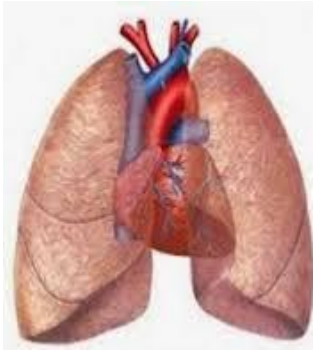
BIDIRECTIONAL IMPACT ON DISEASE PROGRESSION

Inflammation; hypoxia; parenchymal changes; airflow limitation, leading to pulmonary congestion; abnormal left ventricular (LV) diastolic filling; **inhaled beta-agonist may induce deleterious cardiovascular effects**

CHRONIC HEART FAILURE

Elevated LV end-diastolic pressure and **beta-blocker use may compromise lung function**

CHRONIC OBSTRUCTIVE PULMONARY DISEASE



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Identification of a cardio-respiratory structural and functional abnormality

- **BASIC**
  - Spirometry
  - Blood gas analysis
  - Chest radiography
  - ECG
  - Echocardiography
  - Magnetic resonance
- **FUNCTIONAL**
  - Cardio-pulmonary test
  - 6 min walking test
- **EMATOCHIMIC**
  - BNP, Troponin
- **ADDITIONAL**
- Diffusion Lung Carbon Monoxide,
- Ventilation/Perfusion SPECT

Global Strategy for the Diagnosis of Chronic Obstructive Pulmonary Disease
GOLD Executive Summary

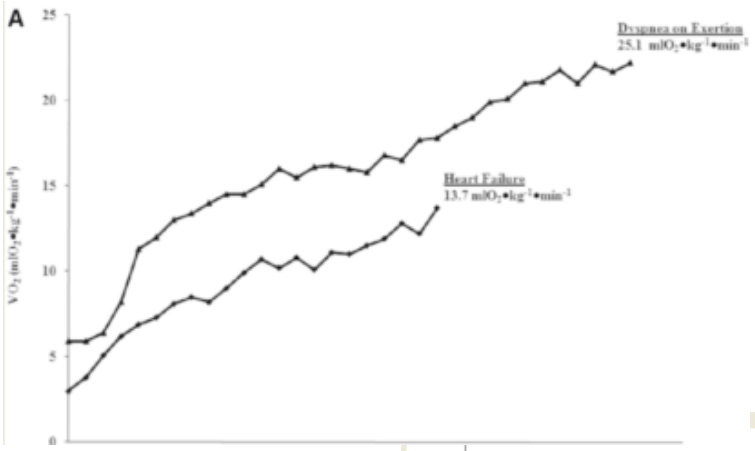
SPIROMETRY is required to make the diagnosis in this clinical context; the presence of a post-bronchodilator FEV1/FVC less than 0.70 confirms the presence of persistent airflow limitation and thus of COPD.

- In patients with FEV1/FVC , 0.70: FEV1
- GOLD 1: Mild > 80% predicted
- GOLD 2: Moderate 50% - < 80% predicted
- GOLD 3: Severe 30% - 50% predicted
- GOLD 4: Very severe < 30% predicted

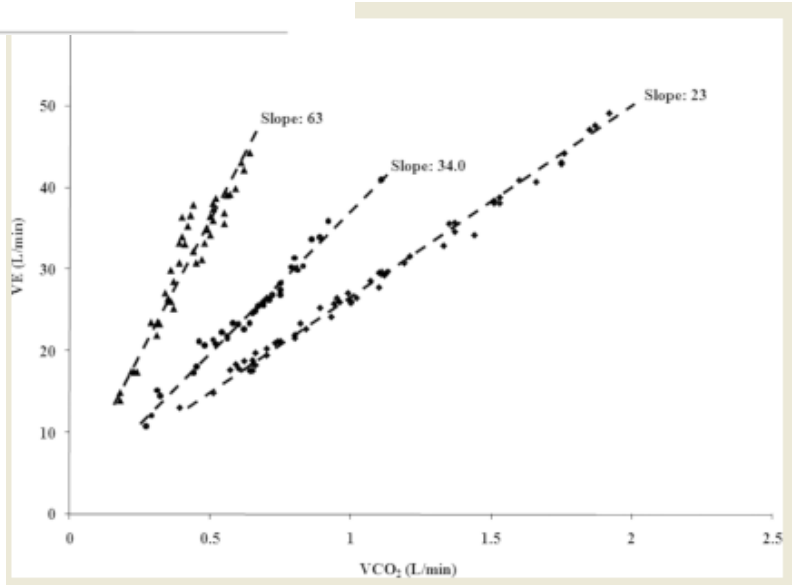
Vestbo J et al., Am J Resp Crit Care Med 2013

CPX in heart failure

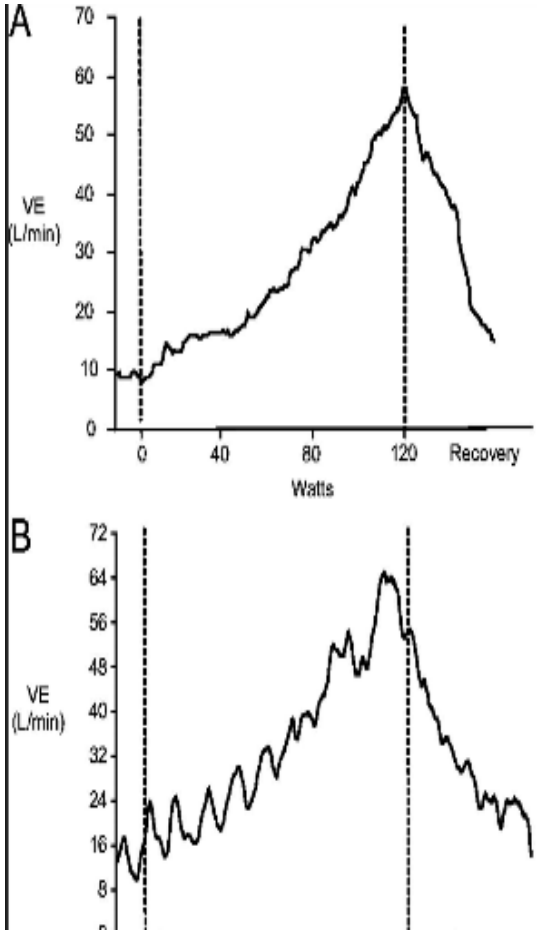
VO2 max



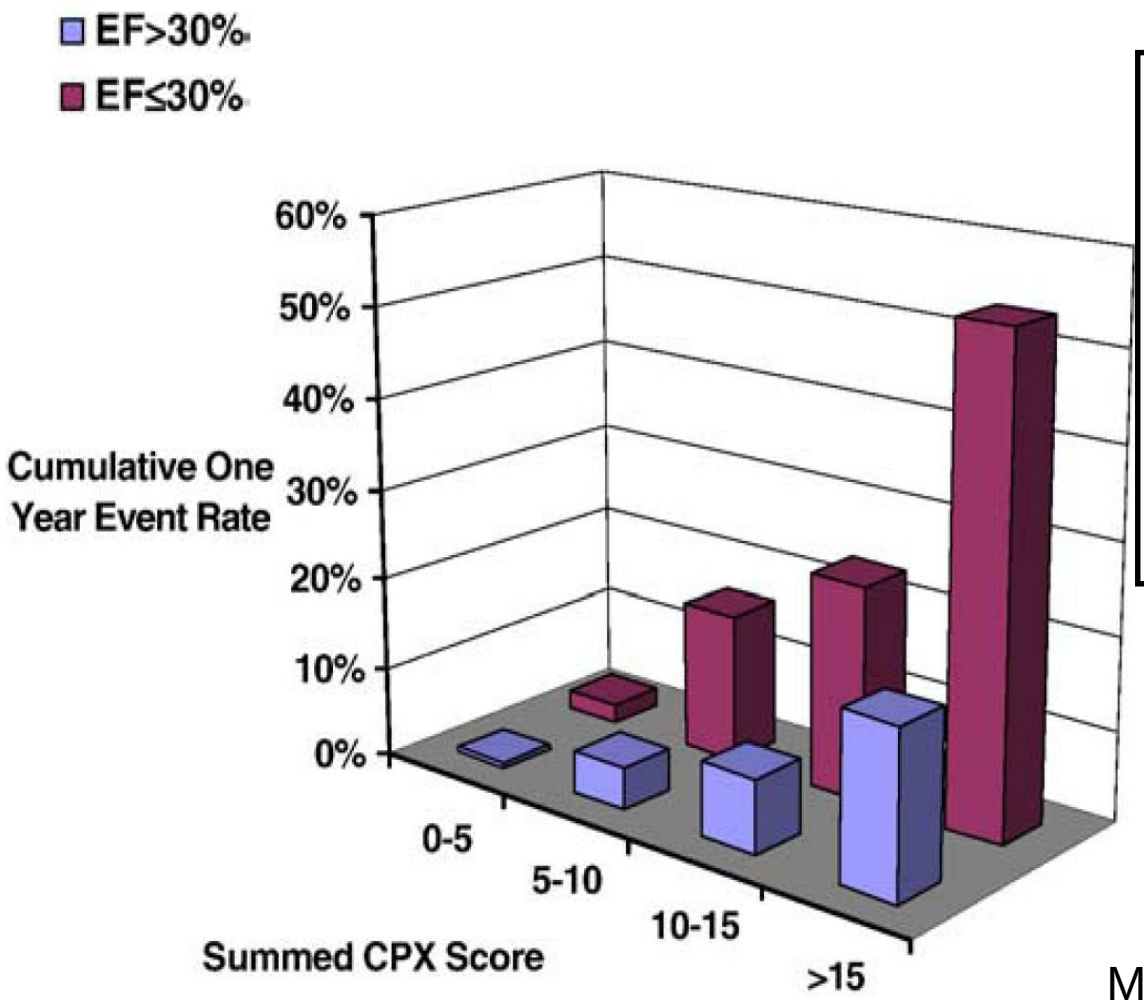
VE/VCO2 slope



Oscillatory breathing



Cumulative 1 year rate of adverse events according to ejection fraction and composite CARDIOPULMONARY EXERCISE test (CPX) score.



CPX score

-VE/VCO_2 slope ≥34 = 7

-Abnormal HRR (≤6 beats at 1 min) = **5**

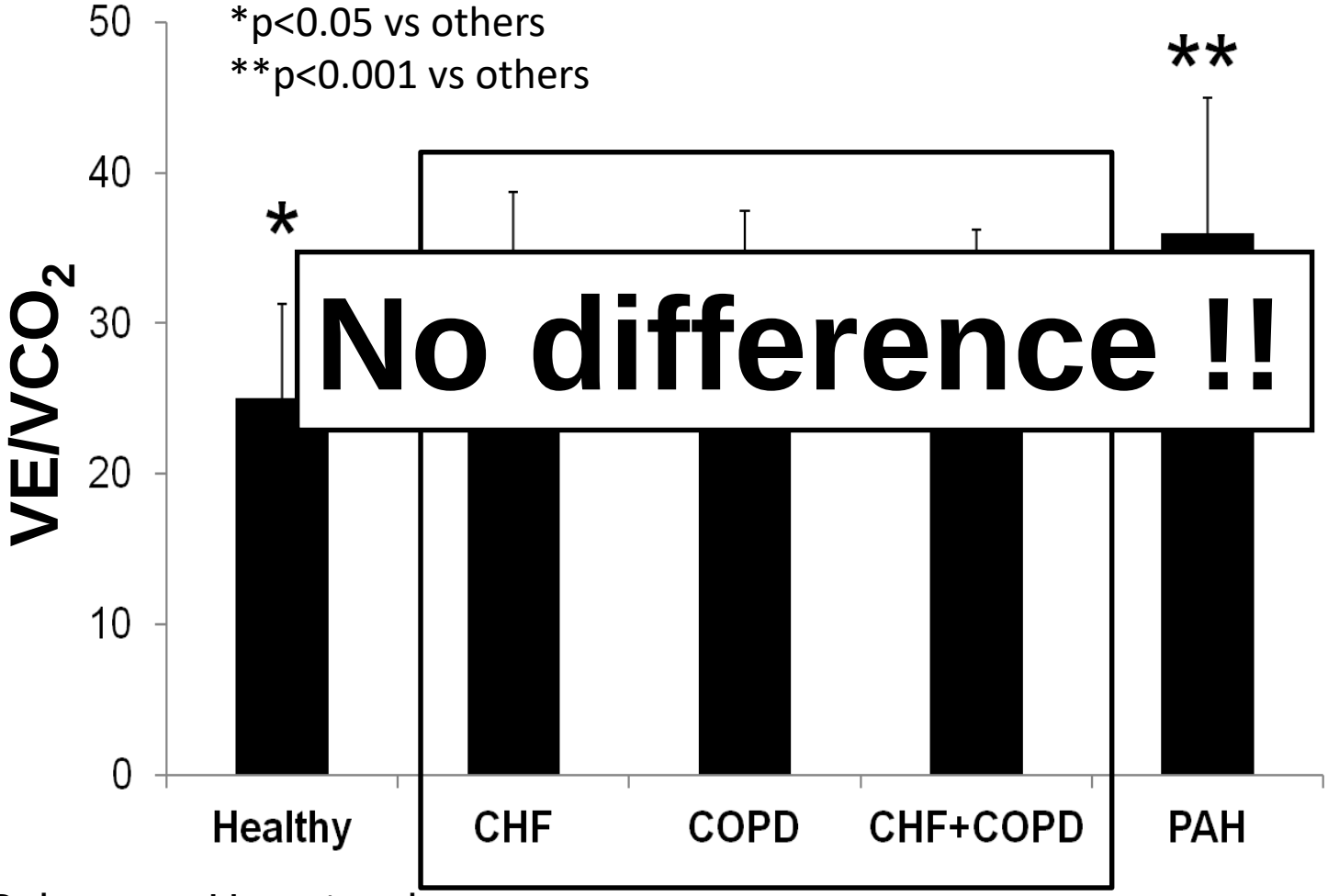
-Oxygen uptake efficiency slope (>1.4) = **3**

-$PetCO_2$ (<33 mm Hg) = **3**

-Peak VO2 (≤14 ml kg^{-1} min^{-1}) = **2**

Myers J et al., Am Heart J 2008

Impact of COPD on exercise ventilatory efficiency in heart failure

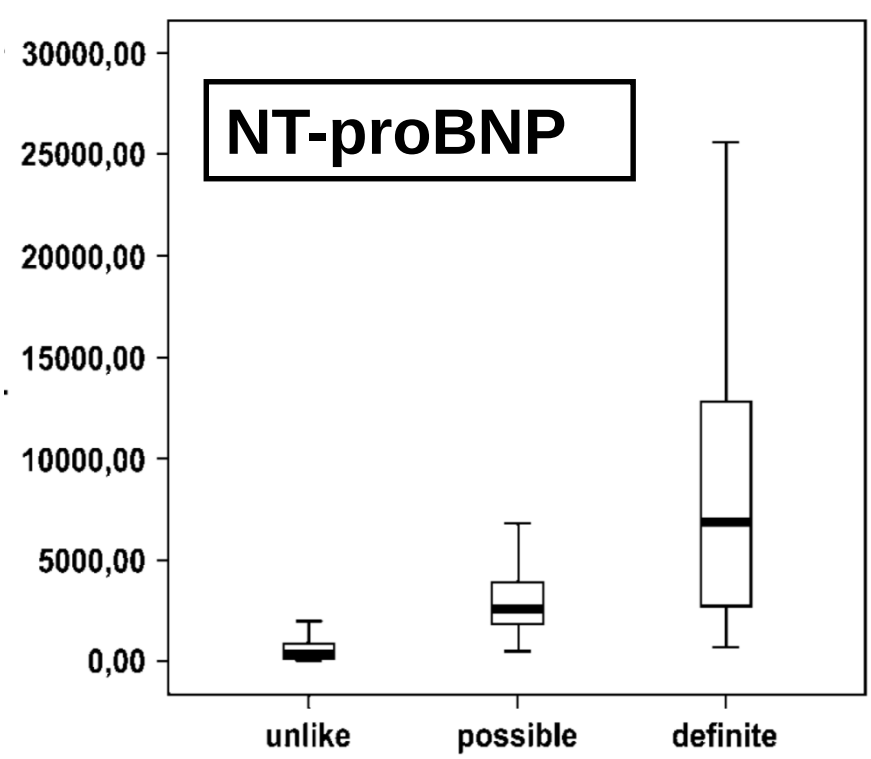


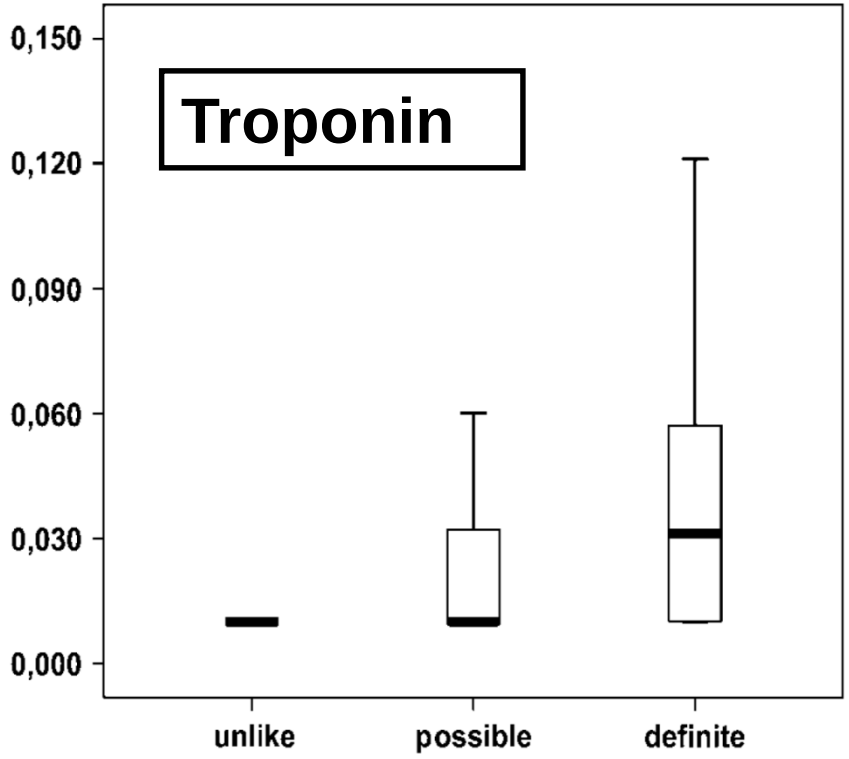
PAH=Pulmonary Hypertension

Apostolo A et al., Intern J Cardiol 20

Association of Left-Heart Dysfunction with Severe Exacerbation of Chronic Obstructive Pulmonary Disease

Diagnostic Performance of Cardiac Biomarkers





Abroug, F et al., Am J Respir Crit Care Med 2006

In 6 minuti al cuore della fragilità: il test del cammino in cardiologia geriatrica

Giovanni Gambassi[1], Matteo Cesari[2], Matteo Tosato[1], Liborio Davide Vetrano[1], Anna Maria Martone[1], Roberto Bernabei[1]

[1]*Centro di Medicina dell'Invecchiamento (CEMI), Università Cattolica del Sacro Cuore, Roma*
[2]*Gerontopole, Université de Toulouse, Tolosa, Francia*

- Strongest indication measuring the response to medical interventions in patients with moderate to severe heart or lung disease

- Used as a one-time measure of functional status of patients, as well as predictor of morbidity and mortality

Giornale Ital. Cardiol, 2014

Original scientific paper

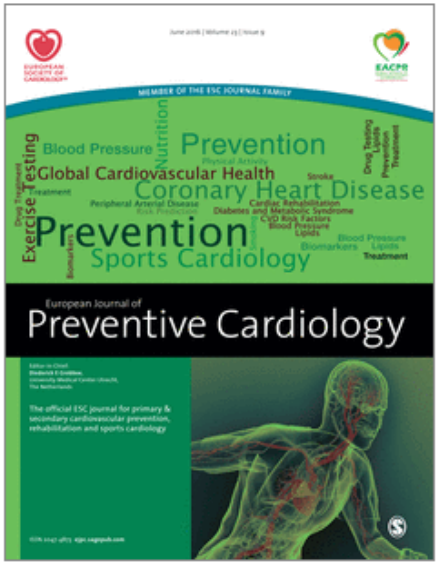
European Journal of Preventive Cardiology

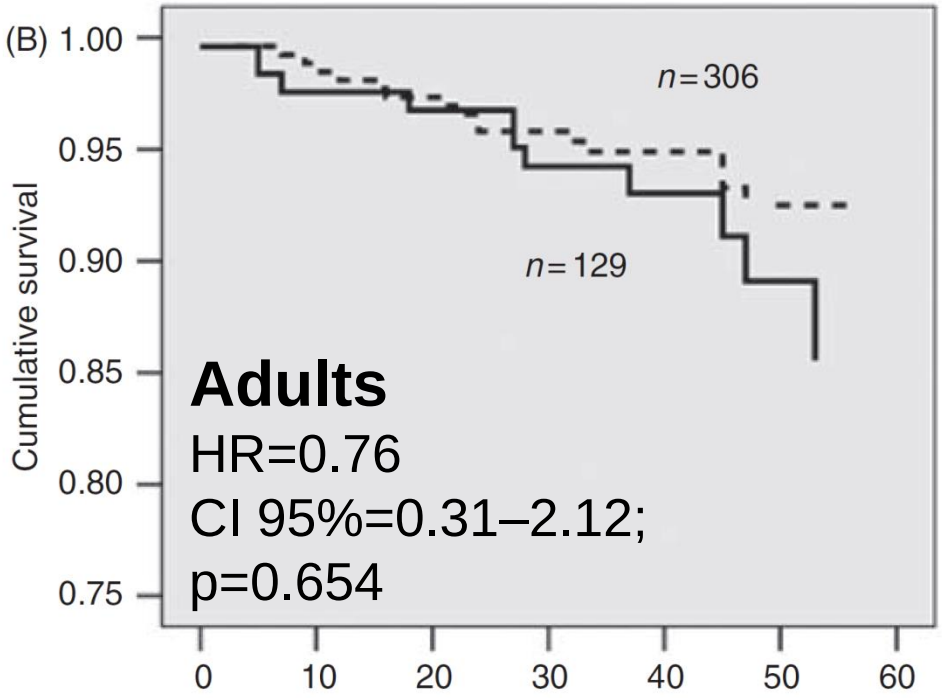
European Journal of Preventive Cardiology
19(6) 1401–1409

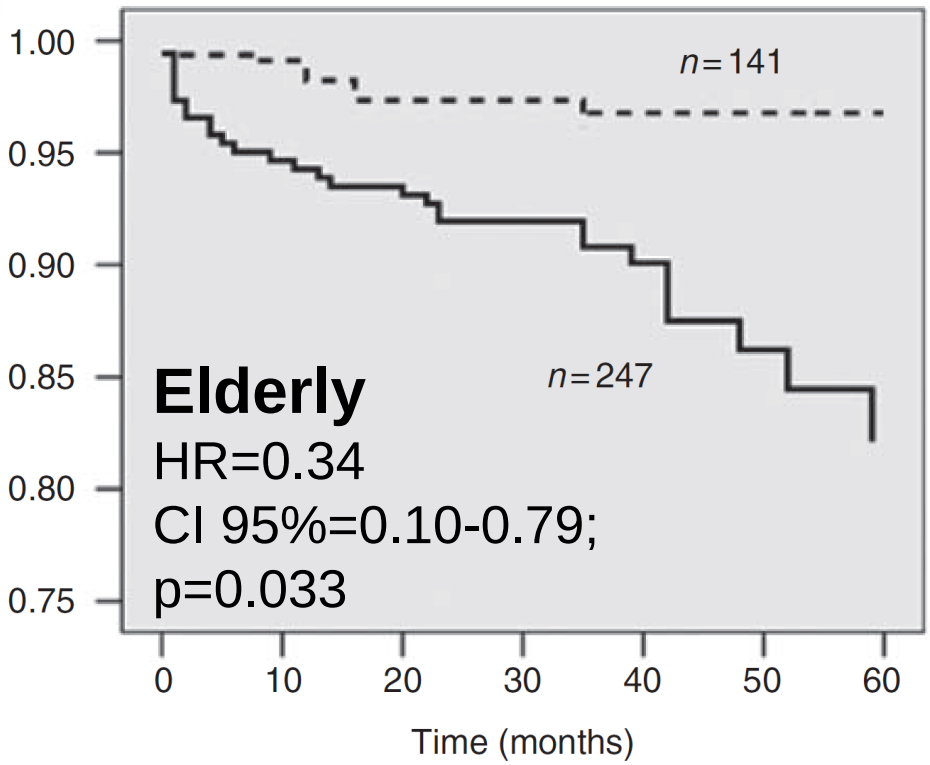
DOI: 10.1177/1741826711422991
ejpc.sagepub.com
SAGE

Six-minute walking test but not ejection fraction predicts mortality in elderly patients undergoing cardiac rehabilitation following coronary artery bypass grafting

Francesco Cacciatore[1], Pasquale Abete[2], Francesca Mazzella[1,2], Giuseppe Furgi[1], Antonio Nicolino[1], Giancarlo Longobardi[1], Gianluca Testa[3], Assunta Langellotto[2], Teresa Infante[4], Claudio Napoli[4], Nicola Ferrara[2] and Franco Rengo[1,2]







Characteristics of elderly subjets stratified for the presence and absence of COPD: evidence of FRAILTY

		COPD		
Variabili	**All (n=1288)**	**No (n=799, 62%)**	**Yes (n=489, 38%)**	**p**
Age (years)	74.2 ±6.3	73.7 ±6.3	74.9 ±6.3	ns
Sex (%)	57.0	64.2	45.2	<0.01
Heart rate (bpm)			10.1	<0.01
Cumulative Illness Rating s			1.7	<0.01
Drug number			2.2	<0.01
MMSE	25.3 ±4.8	25.4 ±4.73	25.3 ±4.9	ns
GDS	11.4 ±6.6	10.7 ±6.6	12.5	<0.01
BADL lost > 1(%)	6.8	5.7	8.6	<0.01
Social support	13.1 ±2.7	13.5±2.8	12.9 ±2.6	ns
SARCOPENIA (%)	285	112 (39.2)	173 (60.8)	<0.01

FRAILTY !

Galizia G et al., Aging Exp Clin Res 2011

European Journal of Clinical Investigation (2005) **35**, 723–730

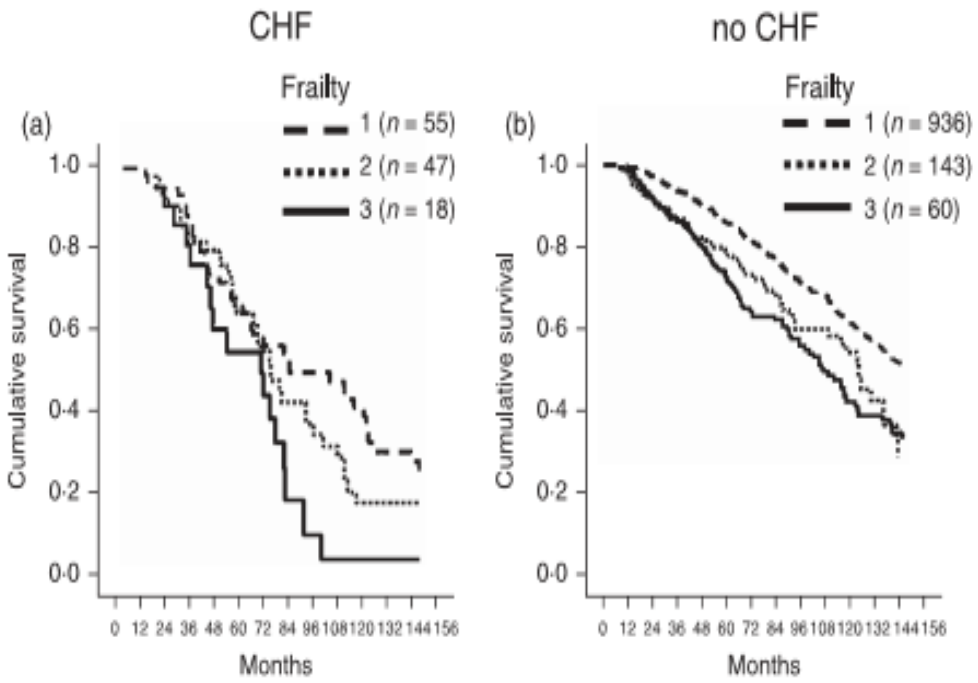
Frailty predicts long-term mortality in elderly subjects with chronic heart failure

F. Cacciatore[*], P. Abete[†], F. Mazzella[†], L. Viati[*], D. Della Morte[†], D. D'Ambrosio[†], G. Gargiulo[†], G. Testa[†], D. De Santis[†], G. Galizia[†], N. Ferrara[*‡] and F. Rengo[*†]

	CHF			No CHF		
Variable	HR	95% CI	*P*	HR	95% CI	*P*
Frailty	1·48	1·04–2·11	0·032	1·36	1·17–1·57	0·000
Dummy variable	HR	95% CI	*P*	HR	95% CI	*P*
Frailty class						
1 vs. 2	1·44	0·82–2·53	0·200	1·74	1·37–2·21	0·000
2 vs. 3	1·49	1·00–2·22	0·047	1·06	0·73–1·52	0·758
3 vs. 1	1·62	1·08–2·45	0·020	1·24	1·04–1·47	0·014

[*]Adjusted for age, sex, NYHA class, comorbidity, systolic blood pressure, diastolic blood pressure, diuretics, ACE-inhibitors, nitrates and digoxin and ischaemic aetiology.

HR, hazard ratio; CI, confidence interval.



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