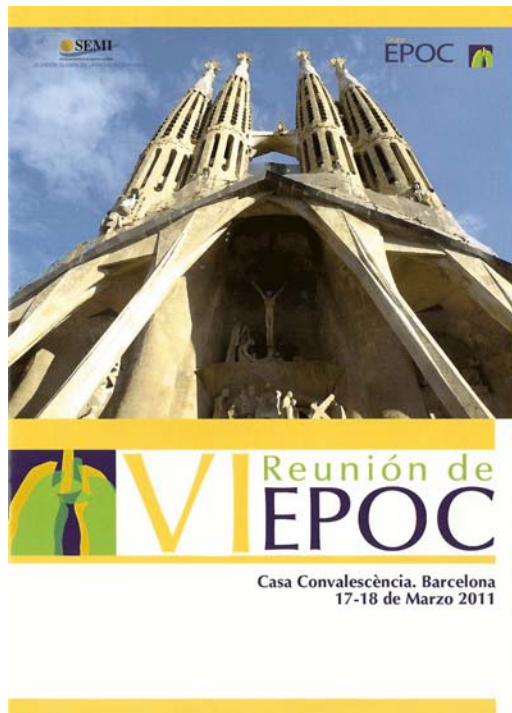




EPOC y anemia

Jesús Díez Manglano

Medicina Interna. Hospital Rojo Villanova. Zaragoza
Departamento de Medicina. Universidad de Zaragoza

EPOC y anemia

- ¿Es un problema? **PREVALENCIA**
- ¿Tiene relevancia? **CONSECUENCIAS**
- ¿Con qué se asocia? **FACTOR DE RIESGO**
- ¿Por qué se produce? **MECANISMOS**
- ¿Cómo la diagnosticamos? **PRUEBAS**
- ¿Cómo la tratamos? **TRATAMIENTO**

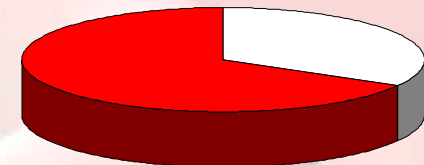
Prevalencia



ECCO



133/398 casos (33%)

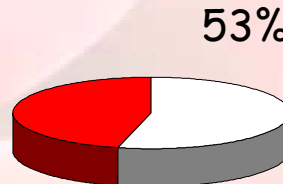
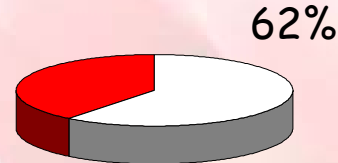


Prevalencia

PROYECTO PROFUND

416/688 (62%)

Díez Manglano J et al.
ERS Annual Congress Barcelona 2010
135/251 (53%)

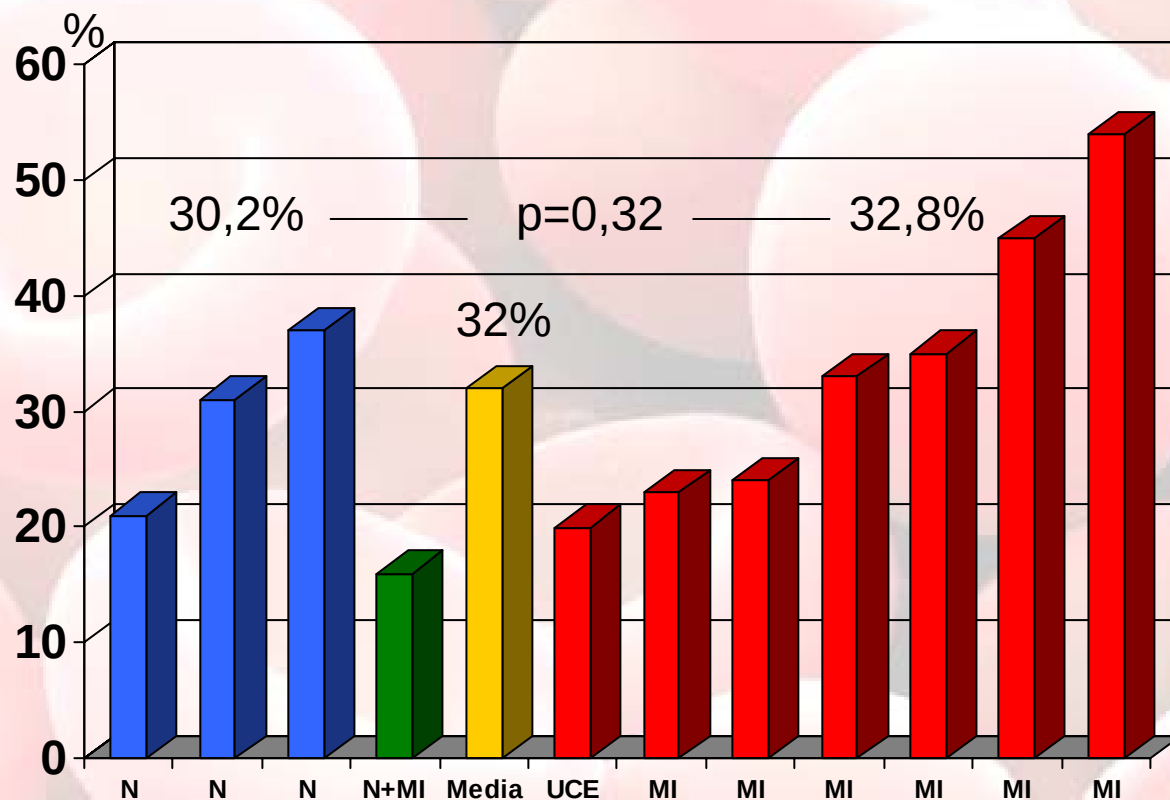
[illegible]

Prevalencia

Anemia in COPD patients in Spain: a systematic review

Jesús Díez-Manglano, José Barquero-Romero

Submitted to ERS Annual Congress 2011 Amsterdam



Prevalencia

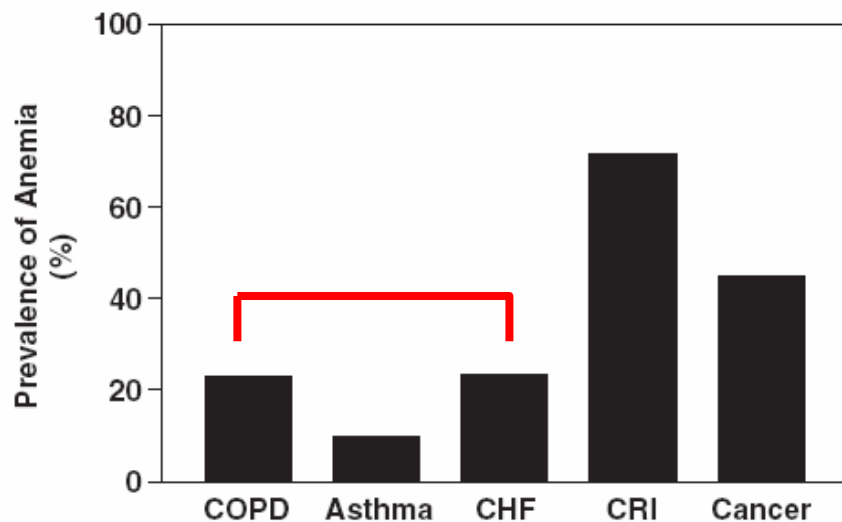


Fig. 2. Prevalence of anemia in chronic diseases. CHF: chronic heart failure; CRI: chronic renal insufficiency.

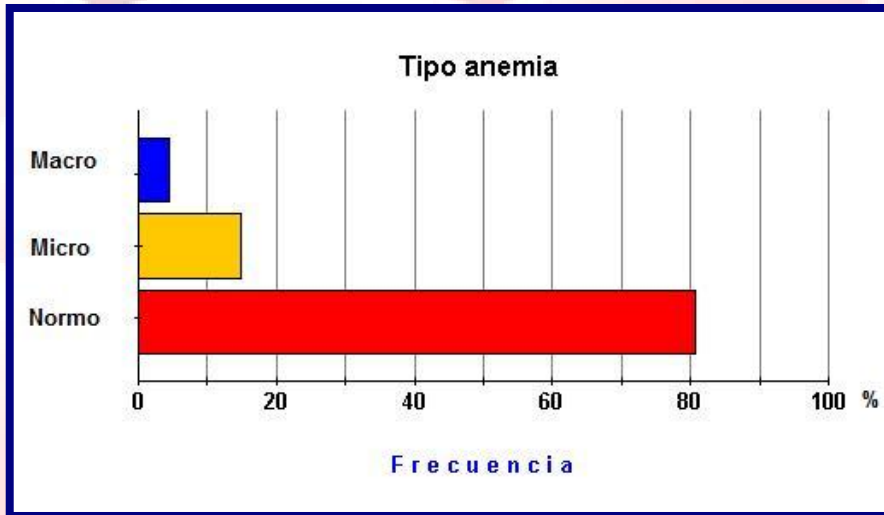
Table 2

Prevalence of anemia in patients with chronic diseases

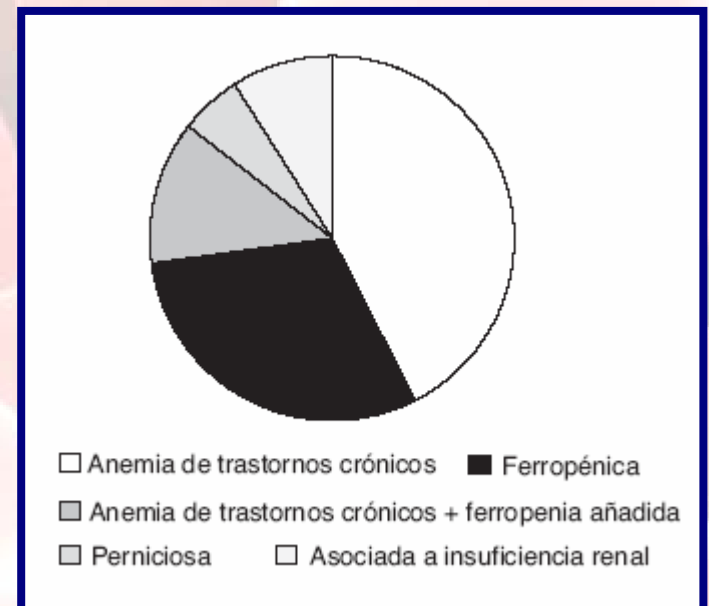
Disease	n	Hgb		Anemia	
		Mean (g/dl)	p-value vs. COPD	Prev. (%)	p-value vs. COPD
COPD	312	13.55±0.10		23.1±2.4	
Asthma	183	13.82±0.12	p=0.1034	9.8±2.2	p=0.0002
CHF	189	13.72±0.14	p=0.3080	23.3±3.1	p=0.9583
CRI	234	11.38±0.14	p<0.0001	71.8±2.9	p<0.0001
Cancer	2124	12.54±0.04	p<0.0001	45.0±1.1	p<0.0001

CHF: chronic heart failure, CRI: chronic renal insufficiency

Prevalencia



Díez Manglano et al. ERS Annual Congress 2010



Portillo K et al. Rev Clin Esp 2007; 207: 383-7

EPOC y anemia

- ¿Es un problema? PREVALENCIA
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- ¿Cómo la tratamos? TRATAMIENTO

Consecuencias

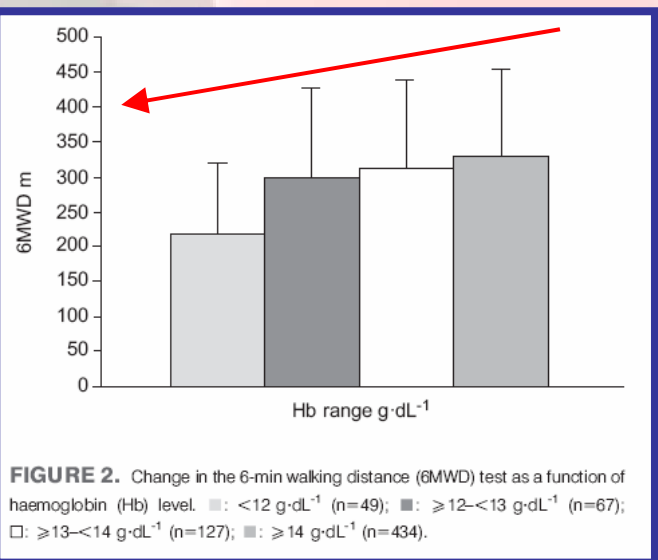
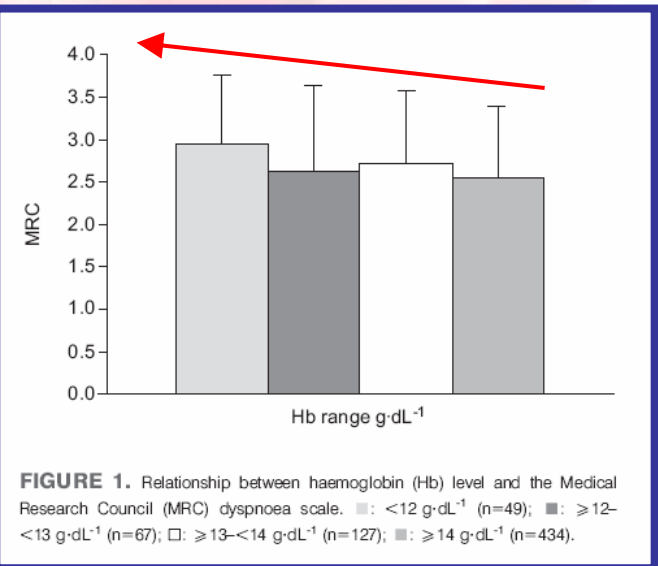
Variable	Anaemic	Nonanaemic	p-value [#]
Subjects n	116	561	
Age yrs	72.8 ± 9.3	69.5 ± 8.8	0.0003
Haemoglobin g·dL ⁻¹	11.8 ± 1.0	15.0 ± 1.2	<0.0001
FEV1 % pred	43.2 ± 17.0	42.1 ± 17.3	0.53
Pa,O ₂ mmHg	72.1 ± 13.3	71.9 ± 11.9	0.87
MRC dyspnoea scale	2.8 ± 0.9	2.6 ± 0.8	0.04
BMI kg·m ⁻²	27.1 ± 6.7	26.3 ± 5.8	0.22
6MWD m	265.4 ± 122.1	325.1 ± 124.4	<0.0001
CCI	6.5 ± 3.5	4.8 ± 2.4	<0.0001
BODE index	5.3 ± 2.6	4.7 ± 2.4	0.01

TABLE 3 Multivariate regression analysis for risk of dyspnoea and functional impairment

	MRC dyspnoea scale			6MWD test		
	β-coefficient	SE	p-value	β-coefficient	SE	p-value
Age	0.008	0.004	0.0199	-1.36	0.52	0.0097
Haemoglobin	-0.036	0.018	0.0479	8.61	2.68	0.0014
FEV1 % pred	-0.023	0.002	<0.0001	2.42	0.26	<0.0001
CCI	0.041	0.012	0.0006	-11.14	1.79	<0.0001
BMI	0.007	0.005	0.1962	-0.02	0.76	0.98

MRC: Medical Research Council; 6MWD: 6-min walking distance; FEV1: forced expiratory volume in one second; % pred: % predicted; CCI: Charlson comorbidity index; BMI: body mass index.

Peor
calidad
de
vida



Consecuencias

BMC Pulmonary Medicine



Research article

Open Access

Association between anemia and quality of life in a population sample of individuals with chronic obstructive pulmonary disease

Gokul Krishnan¹, Brydon J Grant^{1,2,3}, Paola C Muti⁴, Archana Mishra¹, Heather M Ochs-Balcom^{1,2}, Jo L Freudenheim², Maurizio Trevisan² and Holger J Schünemann^{*5}

BMC Pulmonary Medicine 2006, **6**:23

Outcome Variables	Unadjusted Group Means (Std. Error)		P-Value
	Anemia	No Anemia	
Physical Functioning Scores	(n = 37) 39.98 (1.68)	(n = 447) 45.36 (0.48)	0.002
PCS	(n = 37) 41.95 (1.54)	(n = 452) 45.86 (0.44)	0.02
MCS	(n = 37) 49.83 (1.06)	(n = 444) 49.07 (0.30)	0.49

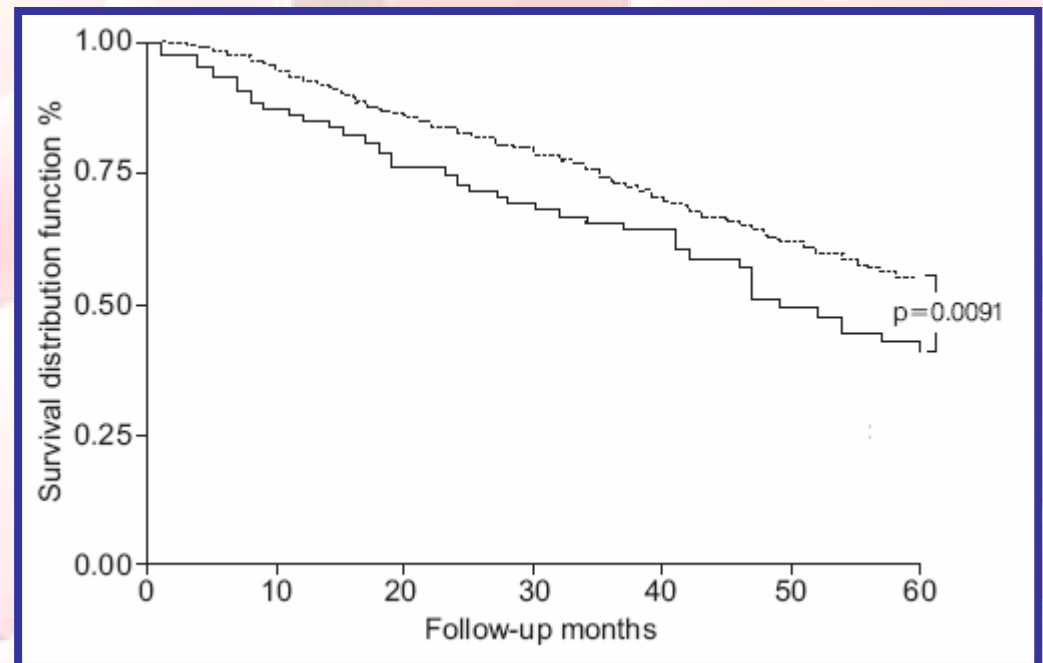
Outcome Variables	Adjusted Group Means (Std Error)		P-Value
	Anemia	No Anemia	
Physical Functioning Scores	(n = 37) 39.26 (2.27)	(n = 447) 42.15 (1.90)	0.095
PCS	(n = 37) 40.62 (2.08)	(n = 452) 43.05 (1.70)	0.14
MCS	(n = 37) 51.81 (1.48)	(n = 444) 51.34 (1.23)	0.68

Conclusion: In patients with moderate to very severe COPD anemia may be associated with worse HRQL. However, co-morbidities may explain part or all of this association in these patients.

Consecuencias

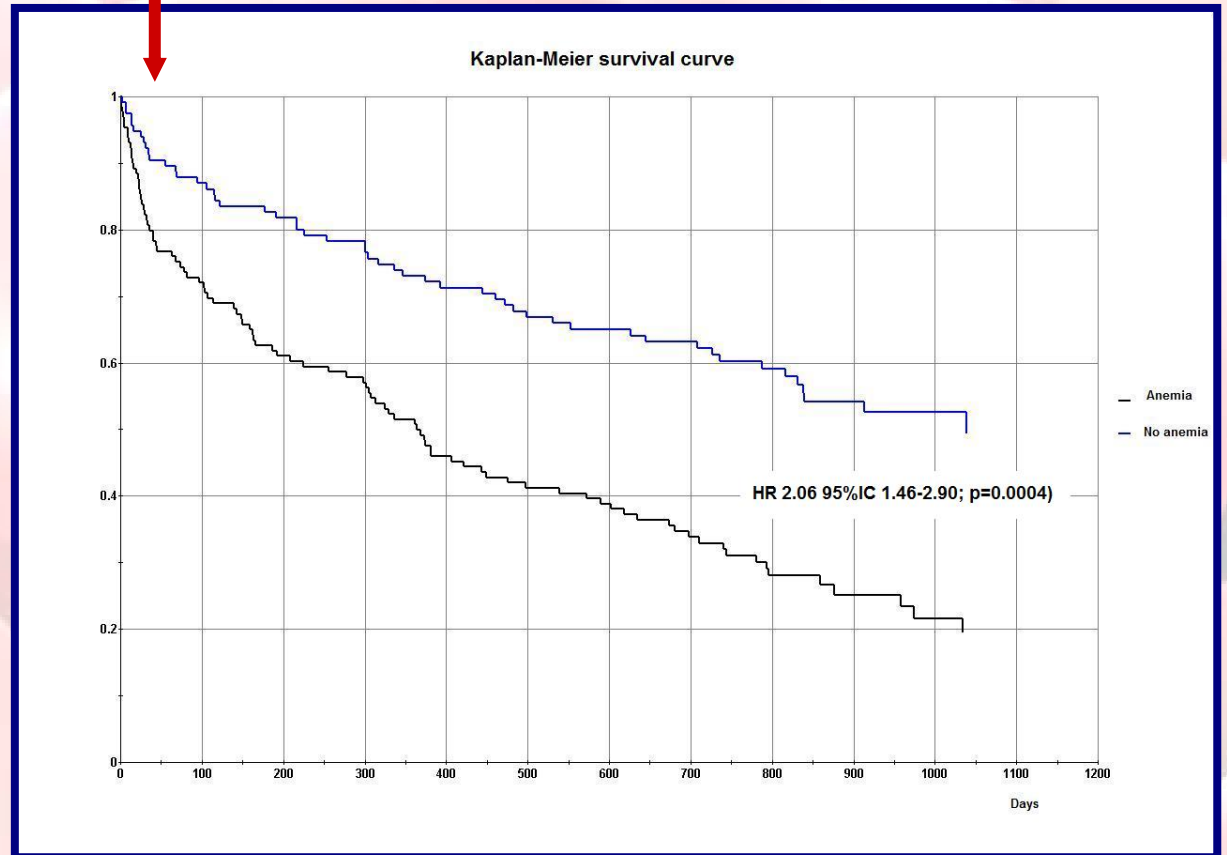
Variable	Survivors	Nonsurvivors	p-value [#]
Subjects n	437	240	
Age yrs	69.4±9.0	71.3±8.8	0.0086
Haemoglobin g·dL ⁻¹	14.6±1.5	14.2±1.9	0.0021
CCI	4.6±2.4	6.1±2.9	<0.0001
BODE index	4.0±2.0	6.3±2.5	<0.0001

Mortalidad



Consecuencias

Mortalidad



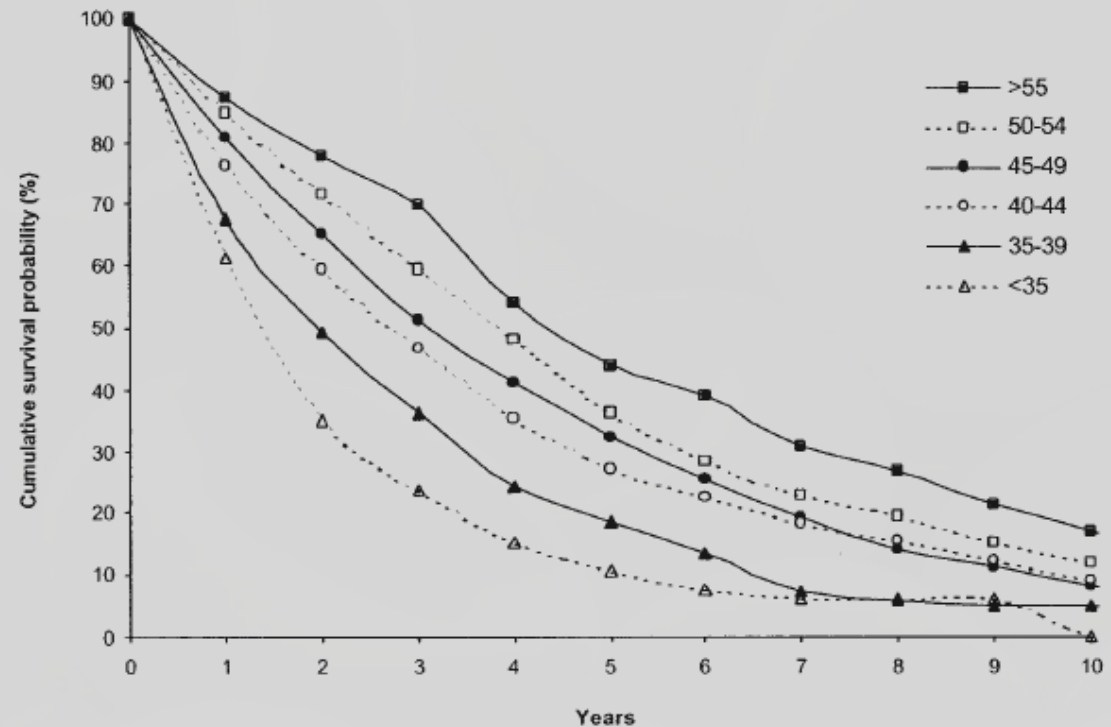
Consecuencias

Prognostic Value of the Hematocrit in Patients With Severe COPD Receiving Long-term Oxygen Therapy*

(*CHEST* 2005; 128:1201-1208)

Arnaud Chambellan, MD; Edmond Chailleux, MD;
Thomas Similowski, MD, PhD; and the ANTADIR Observatory Group†

Mortalidad



Consecuencias

Mortalidad

Table 2 Total numbers and relative risk (mortality rate ratio) of 30-day and 90-day mortality of 222 chronic obstructive pulmonary disease patients treated with invasive mechanical ventilation at Silkeborg Hospital, Denmark, 1994–2004

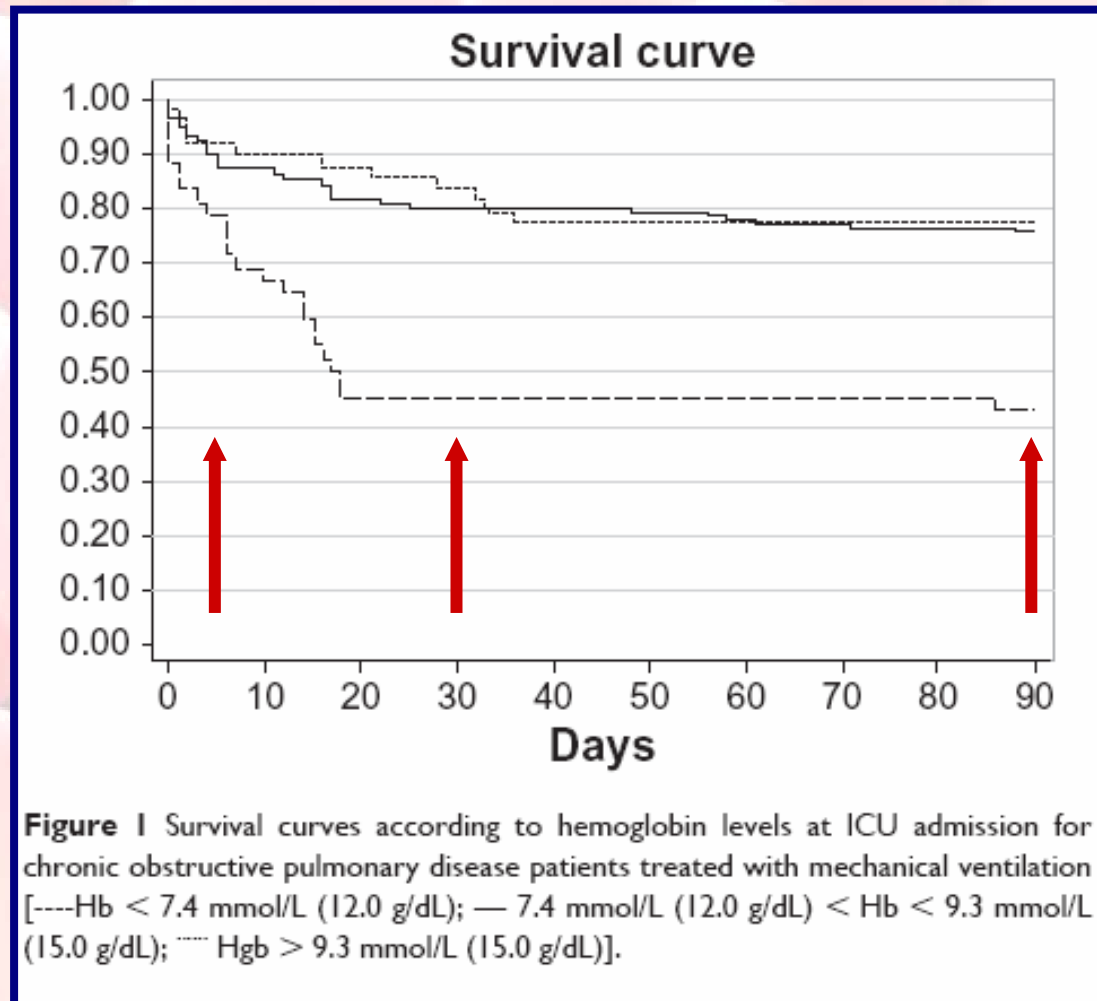
	Mortality (n)	Mortality (%)	Crude risk MRR (95% CI)	Adjusted risk MRR (95% CI)*
30 days				
Hb <7.4 mmol/L (12.0 g/dL)	23	54.8	3.5 (1.8–6.6)	3.1 (1.6–5.9)
Hb 7.4–9.3 mmol/L (12–15 g/dL)	27	20.5	1 (Ref.)	1 (Ref.)
Hb >9.3 mmol/L (15.0 g/dL)	8	16.7	0.9 (0.4–2.1)	1.0 (0.4–2.4)
90 days				
Hb <7.4 mmol/L (12.0 g/dL)	24	57.1	3.0 (1.8–5.2)	2.6 (1.5–4.5)
Hb 7.4–9.3 mmol/L (12–15 g/dL)	33	25.0	1 (Ref.)	1 (Ref.)
Hb >9.3 mmol/L (15.0 g/dL)	11	22.9	0.9 (0.4–1.8)	1.1 (0.5–2.1)

Note: *Adjusted by Cox-proportional hazards regression analysis for gender, age, comorbidity, and pH at intensive care unit admission.

Abbreviations: Hb, hemoglobin; MRR, mortality rate ratios.

Consecuencias

Mortalidad



Consecuencias

Anemia, costs and mortality in Chronic Obstructive Pulmonary Disease

Michael T Halpern¹, Marya D Zilberberg², Jordana K Schmier¹,
Edmund C Lau³ and Andrew F Shorr^{*4}

Cost Effectiveness and Resource Allocation 2006, 4:17

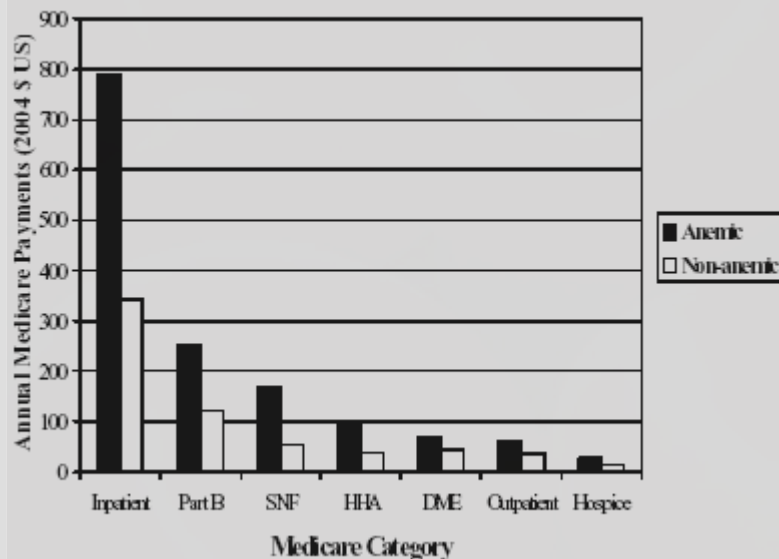
Characteristic	COPD with Anemia (n = 27,932)	Non-anemic COPD (n = 104,492)	P value
# of hospitalizations in 6 months before index date			
Claims per 100 patients	63.2	29.7	<0.001
Claims per 12 month period	1.26	0.59	<0.001
# of ICU encounters in 6 months before index date			
Claims per 100 patients	15.5	7.3	<0.001
Claims per 12 month period	0.31	0.15	<0.001
# of AECB medical encounters in 6 months before index date			
Claims per 100 patients	27.0	16.0	<0.001
Claims per 12 month period	0.54	0.32	<0.001
# of pneumonia medical encounters in 6 months before index date			
Claims per 100 patients	83.5	34.9	<0.001
Claims per 12 month period	1.67	0.79	<0.001

Consecuencias

Anemia, costs and mortality in Chronic Obstructive Pulmonary Disease

Michael T Halpern¹, Marya D Zilberberg², Jordana K Schmier¹,
Edmund C Lau³ and Andrew F Shorr^{*4}

Cost Effectiveness and Resource Allocation 2006, 4:17



- Coste incremental anual 8811 \$
- Doble mortalidad
(262 vs 133/1000 pers/año)
- Mayor asociación con muerte en jóvenes
65-69 años OR 2,07 (1,94-2,22)
80-84 años OR 1,42 (1,39-1,49)

Consecuencias

Consumo de recursos

Table 3. Multivariable linear regression model predicting total healthcare costs in patients with spirometry (n = 692)

Covariate	Change in cost (\$)*	Confidence interval (\$)	p-value
Anemia (vs. no anemia)	+4207	1002–7863	0.0071
Enrollment time (per 1 year)	+1830	1286–2276	<0.0001
Charlson comorbidity score (per 1 point)	+1410	1079–1658	<0.0001
Moderate-to-severe anemia (Hb <11 vs. ≥11 g/dL)	+1846	612–3071	0.0024
Diabetes (vs. no diabetes)	–1620	–2925 to –12	0.0488
Cardiovascular disease (vs. no cardiovascular disease)	+4210	1616–6976	0.0006
Total healthcare costs, 6 months pre-index date (per \$1)	+0.15	0.06–0.22	0.0004
Age (per 1 year)	–80	–100 to –32	0.0036
Physician type at index visit: family practitioner vs. other	–1900	–3225 to –239	0.0261
COPD stage 1 (vs. stage 0, at risk spirometry results)	–1492	–3645–1325	0.2812
COPD stage 2A (vs. stage 0, at risk spirometry results)	+956	–986–3165	0.3630
COPD stage 2B (vs. stage 0, at risk spirometry results)	+3396	847–6188	0.0066
COPD stage 3 (vs. stage 0, at risk spirometry results)	+9633	4149–16 150	<0.0001

*For continuous variables, the average increase or decrease in cost for each additional unit of the variable

Consecuencias

Consumo de recursos

Table 4. Healthcare resource utilization and costs

	Anemic (n = 788)			Non-anemic (n = 1616)		
	Mean* (SD)	Median	Range	Mean* (SD)	Median	Range
Annual healthcare costs (\$)	23 263 (22 275)	17 240	241–230 596	9311 (9233)	6492	359–88 337
Annual healthcare encounters	13.25 (8.81)	11.44	0–62.66	10.14 (7.37)	8.72	0–80.54
Annual hospitalizations	0.50 (0.58)	0.34	0–6.32	0.13 (0.22)	0	0–1.85
LOS per hospital admission (days)	5.59 (6.40)	4	1–94	3.51 (2.79)	3	1–23

* $p < 0.0001$ by Kruskal–Wallis non-parametric test for between-mean differences in all categories
SD = standard deviation; LOS = length of stay

Table 5. Multivariable linear regression model predicting total healthcare costs in all patients (n = 2404)

Covariate	Change in cost (\$)	Confidence interval (\$)	p-value
Female (vs. male)	+1421	580–2318	0.0007
Anemia (vs. no anemia)	+7929	5572–10 599	<0.0001
Caucasian race (vs. other)	+2274	1299–3320	<0.0001
Enrollment time (per 1 year)	+1971	1678–2271	<0.0001
Charlson comorbidity score (per 1 point)	+1458	1315–1602	<0.0001
Moderate-to-severe anemia (Hb <11 vs. ≥ 11 g/dL)	+658	2–1350	0.0495
COPD prescriptions, 6 months pre-index date (per 1 prescription)	+87	58–116	<0.0001
Total healthcare costs, 6 months pre-index date (per \$1)	+0.08	0.04–0.12	0.0001
Age (per 1 year)	–91	–101 to –75	<0.0001
Physician type at index visit: family practitioner vs. other	–1700	–2526 to –804	0.0003

COPD = chronic obstructive pulmonary disease

Consecuencias

- Consultas médicas.
- Exacerbaciones.
- Neumonías.
- Visitas a urgencias.
- Hospitalizaciones.
- Días de hospitalización.
- Ingresos en UCI.
- Ventilación mecánica.
- Trasfusiones.
- Visitas a domicilio.
- Ingresos en residencias.
- Mortalidad.
- Peor calidad de vida.
- Costes.

EPOC y anemia

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- ¿Cómo la tratamos? TRATAMIENTO

Factores de riesgo

Anemia, costs and mortality in Chronic Obstructive Pulmonary Disease

Michael T Halpern¹, Marya D Zilberberg², Jordana K Schmier¹,
Edmund C Lau³ and Andrew F Shorr^{*4}

Cost Effectiveness and Resource Allocation 2006, **4**:17

Variable	COPD with Anemia (n = 27,932)	Non-anemic COPD (n = 104,492)	P value
Demographics			
Age, mean (SD), years	77.5 ± 7.8	74.7 ± 7.6	<0.001
Age distribution (years, %)			
65–69	19.0%	31.5%	<0.001
70–74	20.1%	23.0%	
75–79	21.4%	18.7%	
80–84	18.7%	13.7%	
> 84	20.6%	12.1%	
Male (%)	34.2%	42.4%	<0.001
Pulmonary Characteristics of Interest Present in the Six Month Baseline Period			
Concomitant asthma diagnosis	25.2%	22.6%	<0.001
Use of supplemental oxygen	9.8%	3.7%	<0.001
Comorbidities, % (by ICD-9 coded organ system) Present in the Six Month Baseline Period			
Infectious and parasitic	1.7%	1.4%	<0.001
Skin disorders	2.3%	2.2%	NS
Digestive disorders	2.5%	2.5%	NS
Mental disorders	3.3%	2.9%	<0.001
Genitourinary disorders	3.9%	3.3%	<0.001
Blood diseases	4.3%	0.8%	<0.01
Nervous system	4.4%	6.3%	<0.001
Musculoskeletal disorders	7.7%	9.0%	<0.001
Other respiratory disorders	8.3%	8.8%	<0.001
Endocrine and metabolic	8.5%	7.9%	<0.001
Circulatory disorders	26.8%	26.0%	<0.01

Factores de riesgo

Estadio GOLD

No hay relación (Chi 2 $p=0,06$)

Table 1 Hgb distribution and prevalence of anemia in COPD patients			
Patient group	<i>n</i>	Mean Hgb (g/dl)	Prev. of anemia (%)
Group 1	147	13.18±0.14	27.2±3.7
Group 2	85	13.50±0.18	24.7±4.7
Group 3	80	14.26±0.19	13.8±3.9
All COPD patients	312	13.55±0.10	23.1±2.4

Distribution of patients (as described in Patients and methods), data are shown as mean±S.E.M.
Group 1: patients at COPD stage 0.
Group 2: patients at COPD stage I or stage II.
Group 3: patients at COPD stage III or stage IV.

John M et al. Int J Cardiol 2006; 111: 365

FEV1

No hay relación ($r=0,04$; $p=0,6$)

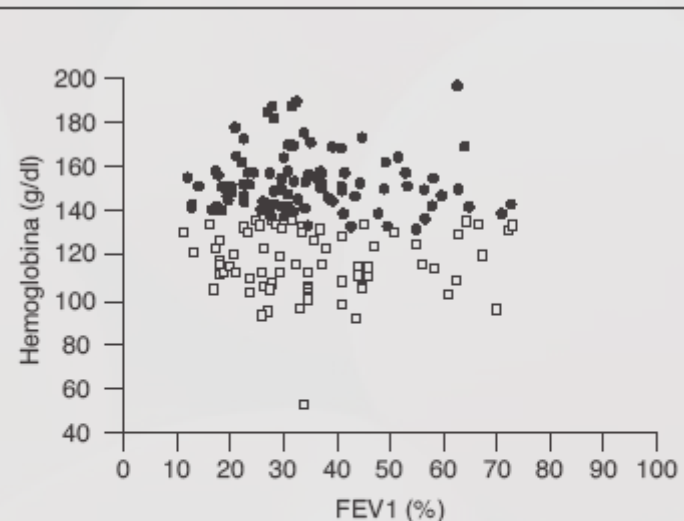
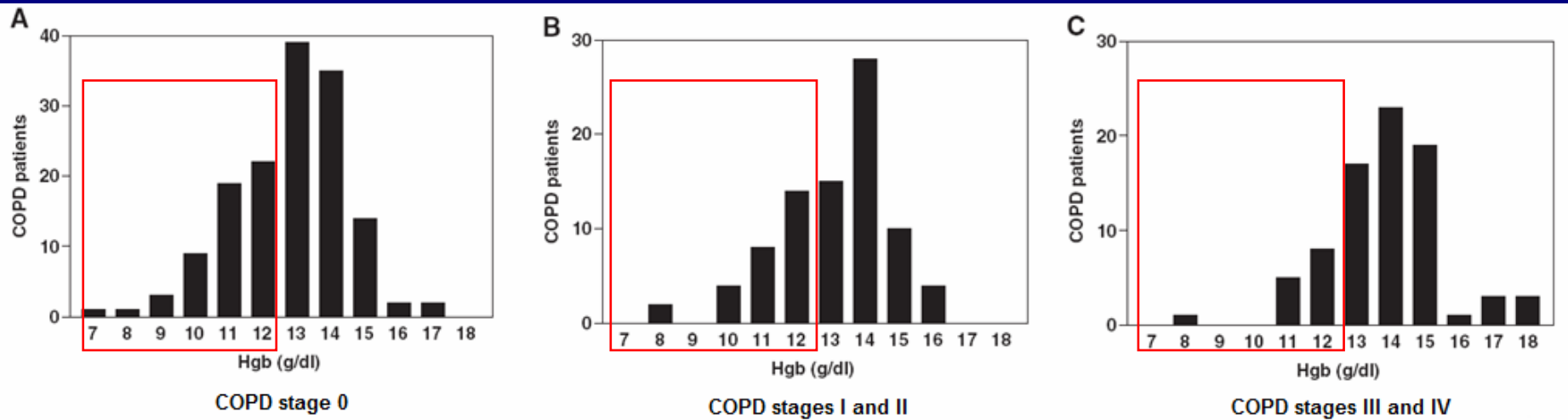


Fig. 2. Relación entre la hemoglobina y el volumen máximo espirado en el primer segundo de una espiración forzada de los pacientes estudiados (FEV1). Los círculos rellenos son pacientes sin anemia y los cuadrados abiertos son pacientes con anemia.

Portillo K et al. Rev Clin Esp 2007; 207: 383-7

Factores de riesgo



John M et al. Int J Cardiol 2006; 111: 365

Factores de riesgo

Estadio GOLD

Table 3—Classification of Severity of Anemic and Nonanemic COPD Patients*

Variables	Anemic COPD Patients	Nonanemic COPD Patients
COPD stage I	3 (23)	20 (23)
COPD stage II	5 (38)	31 (35)
COPD stage III	5 (38)	37 (42)

*Data are presented as No. (%).

Estadio	Pacientes con anemia	Pacientes sin anemia
GOLD 2	31%	34%
GOLD 3	51%	54%
GOLD 4	16%	12%

p=0,38

John M et al. Chest 2005; 127: 825

Estudio ECCO. Datos de archivo no publicados

Factores de riesgo

Factor	OR (IC 95%)
Edad	1,10 (1,02-1,19)
Enfisema	3,76 (1,06-13,3)
Nº ingresos último año	2.01 (1,15-3,51)

Factor	OR (IC 95%)	P
Edad	1,05 (1,02-1,09)	0,0009
IMC	0,92 (0,87-0,97)	0,002
I. Charlson	1,33 (1,14-1,54)	0,0003
FEV ₁ (%)	0,98 (0,96-1,00)	0,05

De Miguel et al. XIII Congreso Neumomadrid, 2008

Estudio ECCO. Datos de archivo no publicados

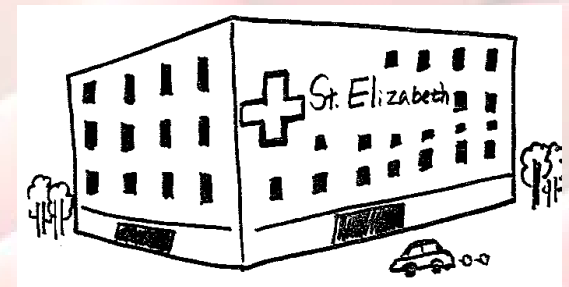
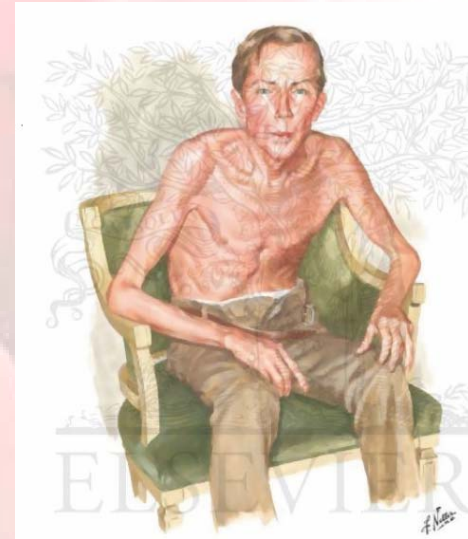
Factores de riesgo

- Edad
- Sexo femenino
- Oxigenoterapia domiciliaria
- Comorbilidades



Factores de riesgo

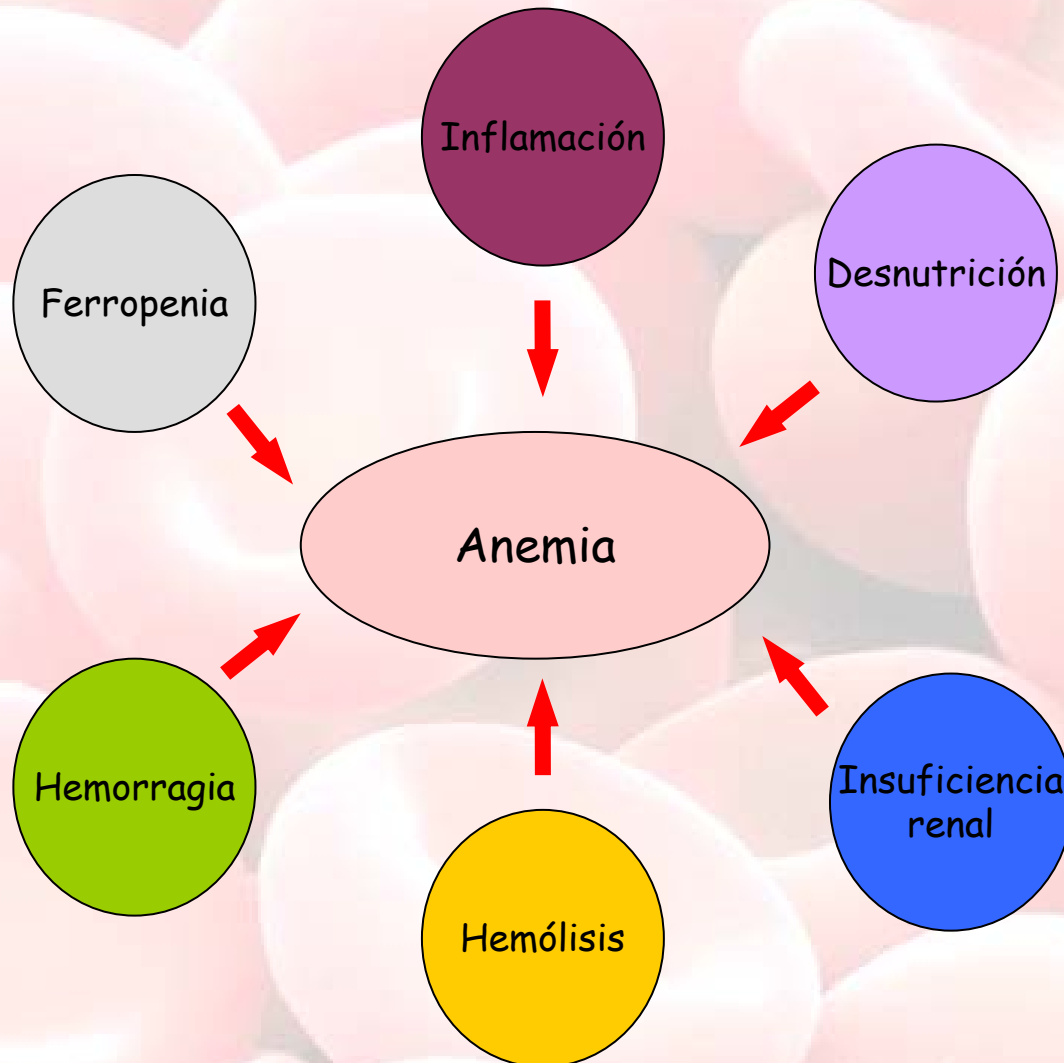
- Delgadez
- Enfisema
- Ingresos en ultimo año



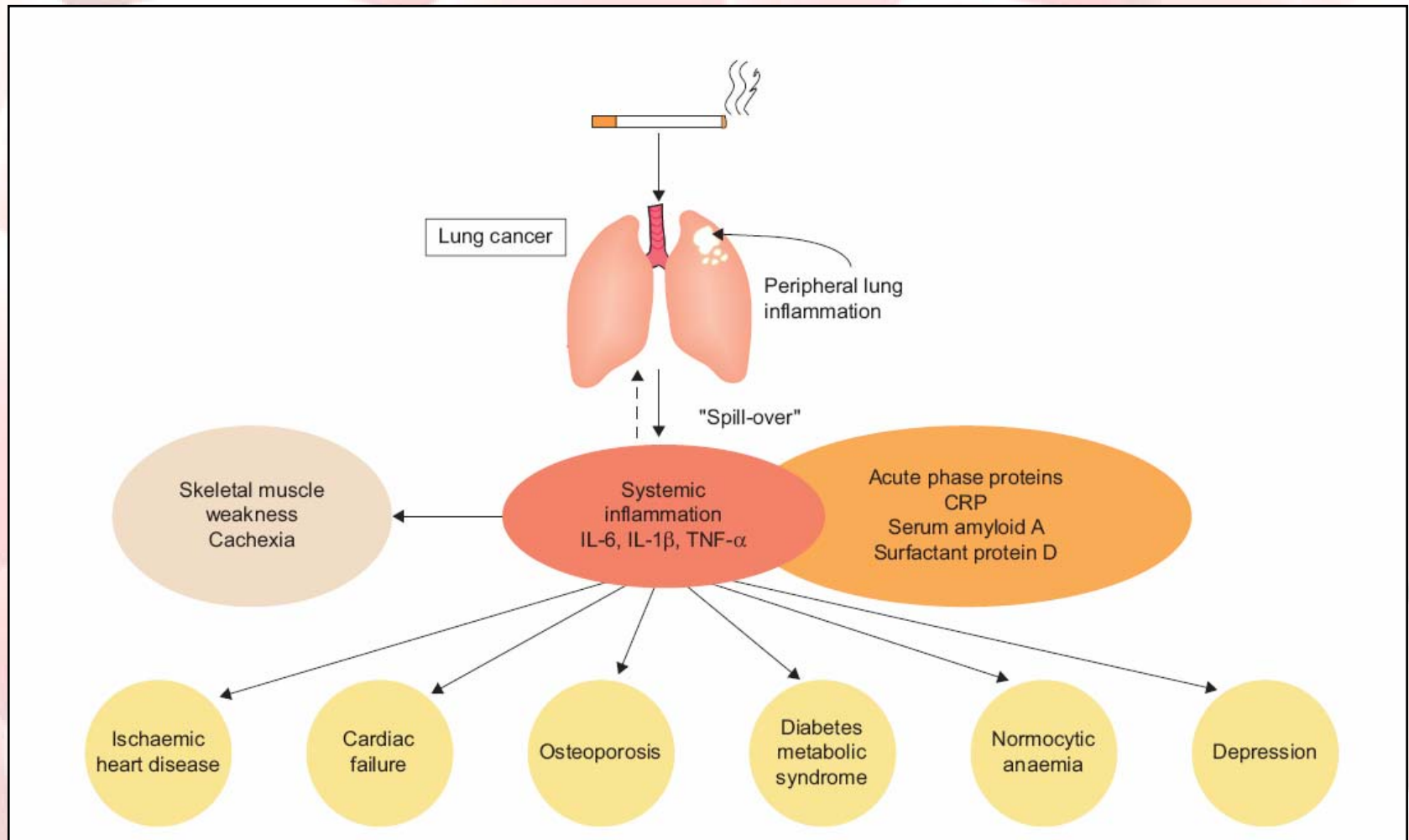
EPOC y anemia

- ¿Es un problema? PREVALENCIA
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- ¿Cómo la diagnosticamos? PRUEBAS
- ¿Cómo la tratamos? TRATAMIENTO

Mecanismos



Mecanismos



Mecanismos

Anemia and Inflammation in COPD*

Matthias John, MD, PhD; Soeren Hoernig, MD; Wolfram Doehner, MD; Darlington D. Okonko, MD; Christian Witt, MD, PhD; and Stefan D. Anker, MD, PhD

Conclusion: Anemic COPD patients show high erythropoietin levels, which may indicate presence of erythropoietin resistance. The latter may be mediated through inflammatory mechanisms, which is typical for anemia of chronic illness. (CHEST 2005; 127:825–829)

Variables	Nonanemic COPD Patients (n = 88)	Anemic COPD Patients (n = 13)	p Value, Anemic vs Nonanemic
Hemoglobin, g/dL	14.7 ± 0.2	11.9 ± 0.4	< 0.0001
Hematocrit	0.44 ± 0.01	0.36 ± 0.01	< 0.0001
Erythrocytes/picoliter	4.85 ± 0.05	4.09 ± 0.11	< 0.0001
Erythropoietin, U/L	16.3 ± 2.9 (n = 60)	41.8 ± 25.4 (n = 9)	< 0.05
Log CRP, mg/dL	− 0.199 ± 0.067 (n = 80)	0.465 ± 0.228 (n = 11)	< 0.001
Median; IQR	− 0.154; 0.916	0.398; 1.042	
Log IL-6, pg/mL	0.854 ± 0.041 (n = 66)	1.061 ± 0.215 (n = 8)	0.1
Median; IQR	0.699; 0.255	0.699; 0.764	
IL-8, pg/mL	5.3 ± 0.1 (n = 46)	5.4 ± 0.4 (n = 6)	0.9
IL-10, pg/mL	4.3 ± 0.4 (n = 54)	5.2 ± 1.6 (n = 10)	0.4

*Data are shown as mean ± SEM.

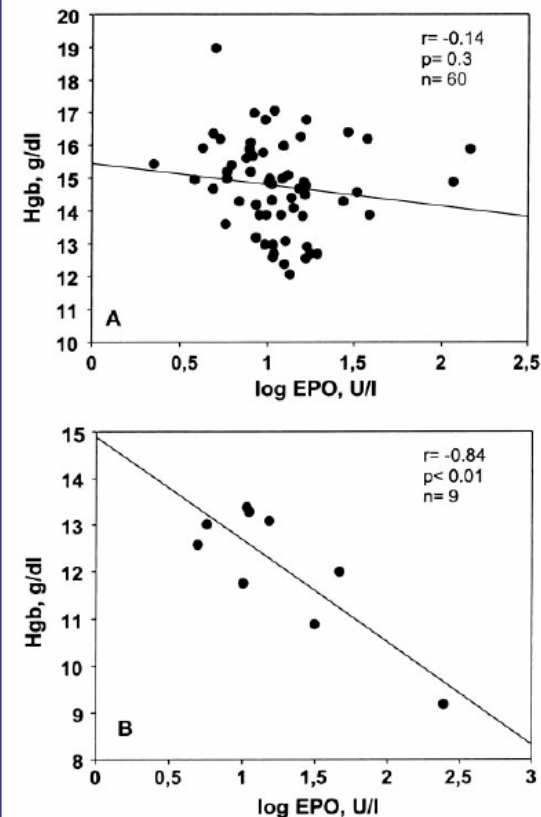


FIGURE 1. Top: Correlation of hemoglobin (Hgb) vs erythropoietin (EPO) in nonanemic COPD patients ($r = -0.14$; $p > 0.2$; $n = 60$). Bottom: Correlation of hemoglobin vs erythropoietin in anemic COPD patients ($r = -0.84$; $p < 0.01$; $n = 9$).

Mecanismos

Hemoglobin, erythropoietin and systemic inflammation in exacerbations of chronic obstructive pulmonary disease☆

Despoina Markoulaki^a, Konstantinos Kostikas^b, Georgios Papatheodorou^c, Angela Koutsokera^b, Manos Alchanatis^a, Petros Bakakos^a, Konstantinos I. Gourgoulidis^b, Charis Roussos^a, Nikolaos G. Koulouris^a, Stelios Loukides^{a,*}

European Journal of Internal Medicine 22 (2011) 103–107



Time-course of the levels of Hb, EPO and inflammatory biomarkers.

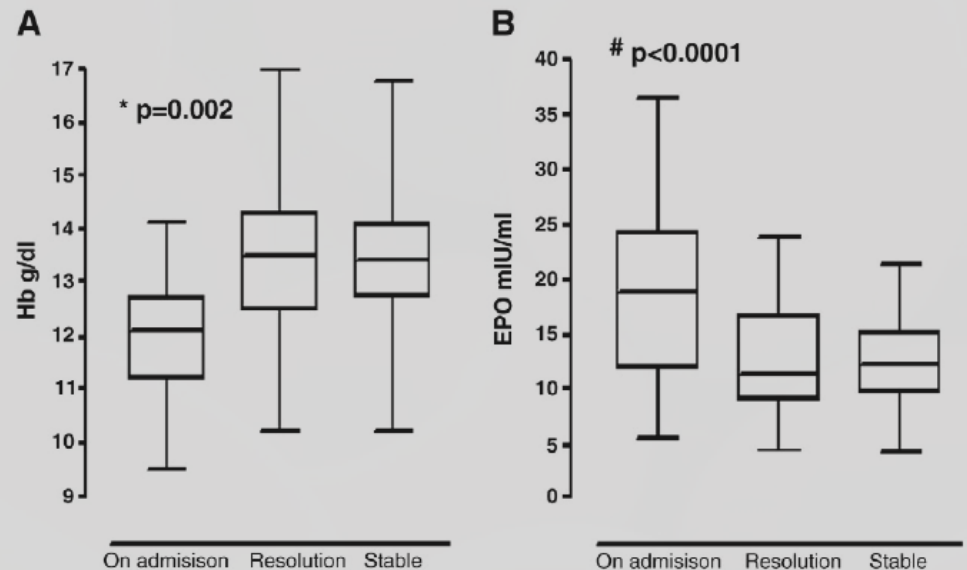
Parameter	Admission	Resolution	12 weeks
Hb [g/dl]	12.1 (11.2–12.7)	13.5 (12.4–14.3)*	13.4 (12.7–14.08)
EPO [mIU/ml]	18.9 (11.8–24.3)	11.3 (8.9–16.7)**	12.2 (9.7–15.2)
Fibrinogen [mg/dl; mean ± SD]	475 ± 103	364 ± 64**	387 ± 79
CRP [g/dl]	4.9 (2.7–8.3)	1.2. (0.6–1.7)**	0.9 (0.5–1.2)
IL-6 [pg/ml]	15 (9–18)	8.7 (6–12.5)**	8.5 (6–11.5)
TNF-α [pg/ml]	2.7 (1.7–3.7)	1.6 (1–2)**	1.6 (1.2–1.7)

Data are presented as mean ± SD when normally distributed and as median interquartile ranges when non-normally distributed.

No significant differences were observed in any of the parameters studied between resolution and 12 weeks (all p values > 0.05). Abbreviations: Hb : hemoglobin; EPO: erythropoietin; CRP: C-reactive-protein; IL-6: interleukin-6; TNF-α: tumor necrosis factor alpha.

* p < 0.05 significantly higher values compared to the admission levels.

** p < 0.05 significantly lower values compared to the admission levels.



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Associations between log Hb, log EPO and the levels of inflammatory biomarkers on admission.

	Log Hb				Log EPO			
	Unadjusted		Adjusted ^a		Unadjusted		Adjusted ^a	
	R ²	p	R ²	p	R ²	p	R ²	p
EPO	-0.74	<0.0001	-0.68	<0.0001				
CRP	-0.12	0.11	-0.13	0.1	0.2	0.03	0.16	0.09
IL-6	-0.55	0.0005	-0.49	0.002	0.53	0.0002	0.44	0.001
TNF-α	-0.01	0.5	-0.09	0.4	0.1	0.3	0.12	0.1
Fibrinogen	-0.06	0.4	-0.05	0.4	0.08	0.56	0.01	0.4

Bold figures represent statistically significant associations. Abbreviations: Hb: hemoglobin; EPO: erythropoietin; CRP: C-reactive-protein; IL-6: interleukin-6; TNF-α: tumor necrosis factor alpha.

^a Adjusted for age, gender, CCIS, BMI, smoking habit, hospitalization time, treatment regimens before admission (including LTOT and ACE inhibitors) and PaO₂/FiO₂ ratio.

Associations between log Hb, EPO and the levels of inflammatory biomarkers on stable state [12 weeks after resolution].

	Log Hb				Log EPO			
	Unadjusted		Adjusted ^a		Unadjusted		Adjusted ^a	
	R ²	p	R ²	p	R ²	p	R ²	p
EPO	0.37	0.0002	0.3	0.001				
CRP	-0.07	0.35	-0.09	0.1	0.09	0.3	0.11	0.08
IL-6	-0.14	0.09	-0.17	0.08	0.1	0.1	0.15	0.05
TNF-α	-0.06	0.5	-0.09	0.15	0.08	0.6	0.1	0.1
Fibrinogen	-0.05	0.7	-0.07	0.3	0.03	0.7	0.07	0.2

Bold numbers represent statistically significant associations. Abbreviations: Hb: hemoglobin; EPO: erythropoietin; CRP: C-reactive-protein; IL-6: interleukin-6; TNF-α: tumor necrosis factor alpha.

^a Adjusted for age, gender, BMI, smoking habit, hospitalization time, CCIS, prescribed treatment regimens after discharge (including LTOT and ACE inhibitors) and PaO₂/FiO₂ ratio.

EPOC y anemia

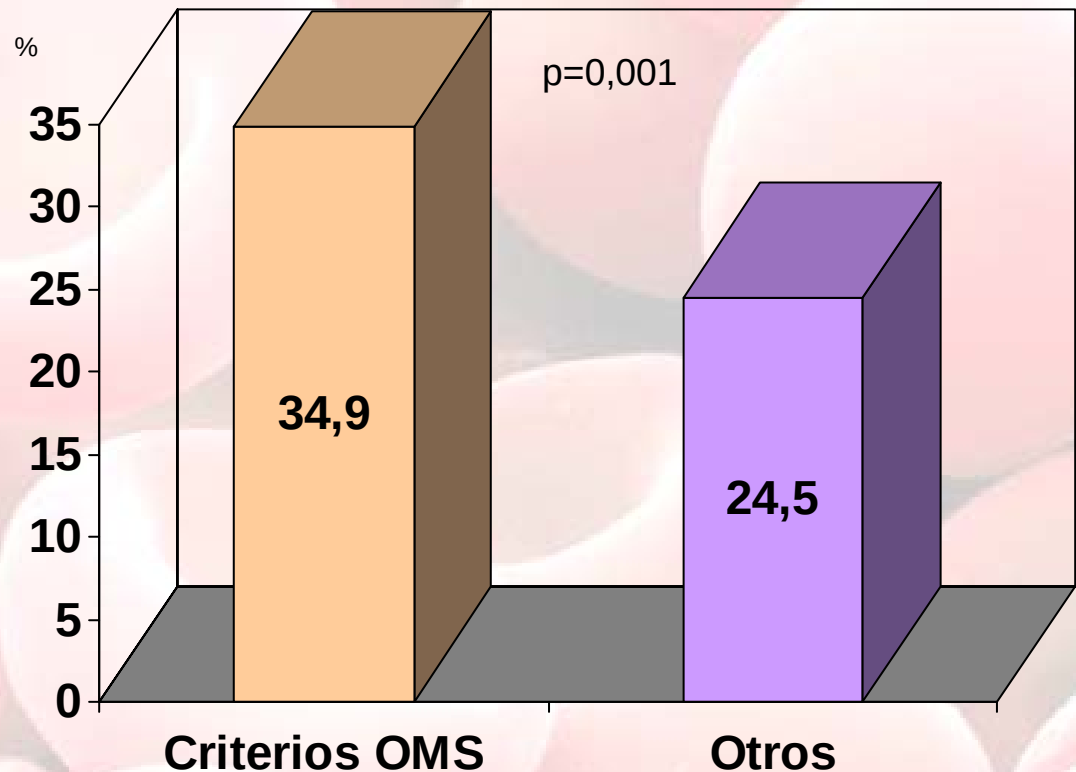
- ¿Es un problema? PREVALENCIA
- ¿Tiene relevancia? CONSECUENCIAS
- ¿Con qué se asocia? FACTOR DE RIESGO
- ¿Por qué se produce? MECANISMOS
- ¿Cómo la diagnosticamos? **PRUEBAS**
- ¿Cómo la tratamos? TRATAMIENTO

Diagnóstico

Anemia in COPD patients in Spain: a systematic review

Jesús Díez-Manglano, José Barquero-Romero

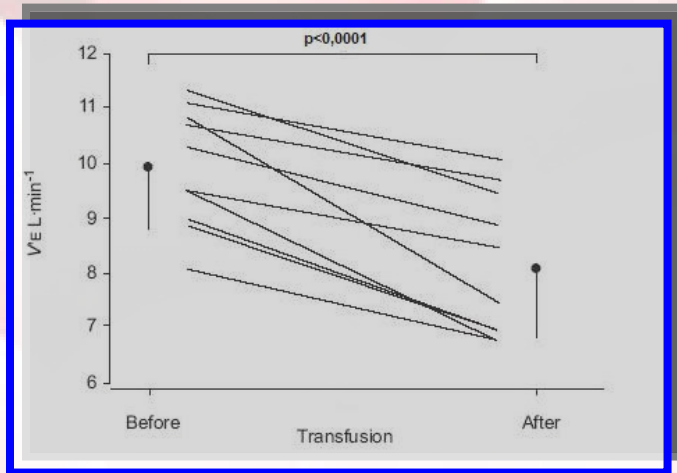
Submitted to ERS Annual Congress 2011 Amsterdam



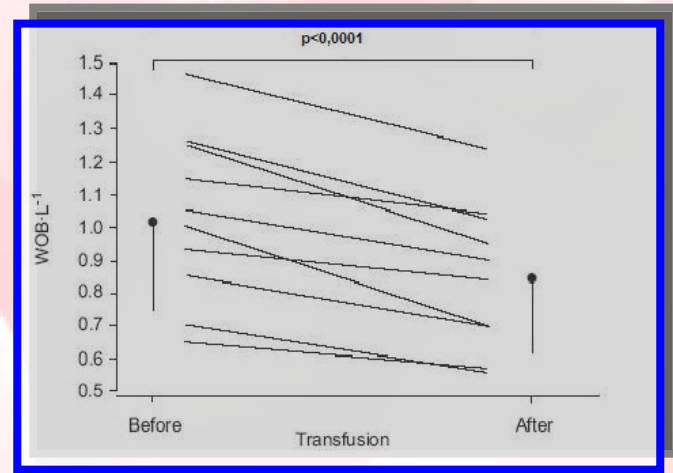
EPOC y anemia

- ¿Es un problema? PREVALENCIA
- ¿Tiene relevancia? CONSECUENCIAS
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- ¿Cómo la tratamos? **TRATAMIENTO**

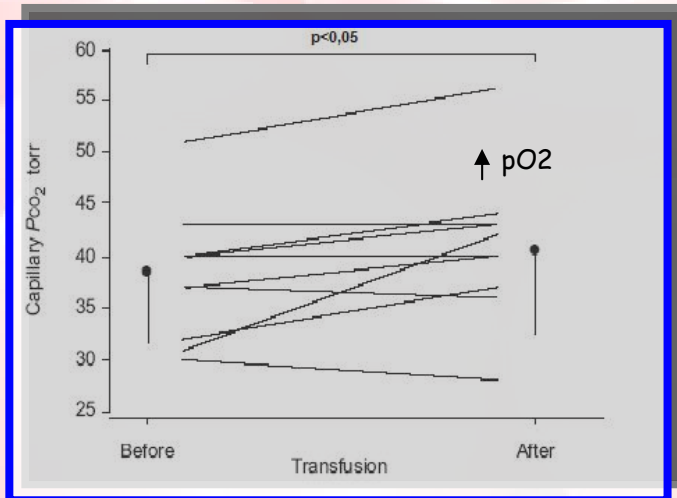
Tratamiento de la anemia



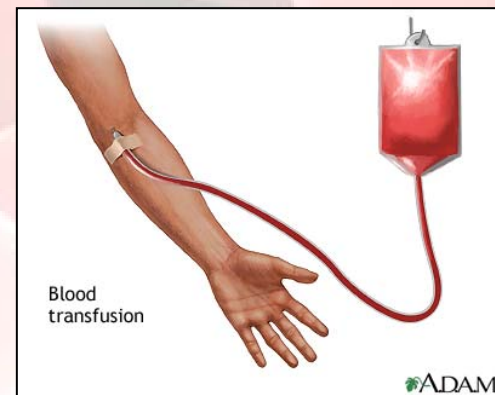
Ventilación minuto



Trabajo respiratorio



pCO_2



Resumen

Yohannes AM, Ershler WB. Anemia in Chronic Obstructive Pulmonary Disease: A Systematic Review of the Prevalence, Quality of Life and Mortality. Respir Care 2001 Jan 27 [Epub ahead of print]

The prevalence of comorbid anemia in patients with COPD ranges from 7.5% to 34% depending upon the populations selected and diagnostic tools employed to determine the level of haemoglobin..... There is a lack of consensus agreement regarding this haematological abnormalities and true frequency.

Therefore, based on the findings from the existing literature, it indicates that much more work is necessary to establish the true prevalence of anemia in COPD.

Robust and prospective clinical studies are needed to improve the management of COPD patients with comorbid anemia.