Grupo de EPOC
Enfermedad Pulmonar Obstructiva Crónica

Riesgo de osteoporosis y de fractura en pacientes con EPOC

Valoración en pacientes del estudio ECCO

Estudio ECCO

Estudio ECCO
(Epoc con comorbilidad)
Descripción

Estudio ECCO. Objetivos

Objetivo principal

- Evaluar la comorbilidad asociada a la EPOC en pacientes ingresados en los Servicios de Medicina Interna.

Objetivos secundarios

- Determinar la repercusión que la comorbilidad asociada a la EPOC produce sobre el consumo de recursos sanitarios y sobre la estancia hospitalaria.

- Evaluar la mortalidad de la EPOC asociada a la comorbilidad.

Estudio ECCO. Diseño

- Observacional
- Prospectivo
- Multicéntrico

74 investigadores
38 hospitales

Estudio ECCO. Diseño

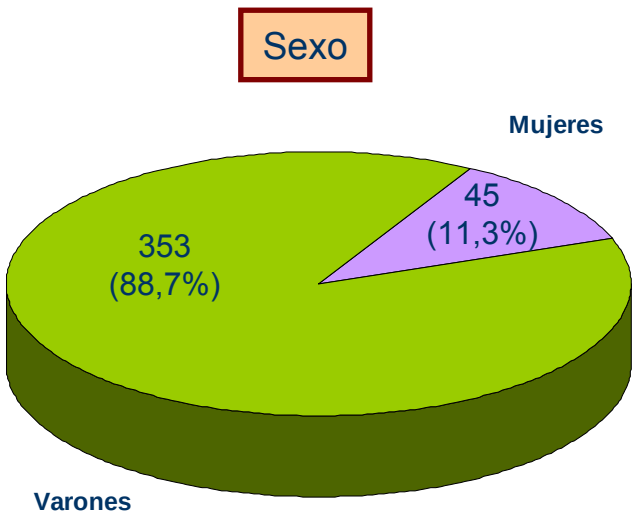
Criterios de inclusión

Pacientes ingresados en servicios de Medicina Interna con EPOC, definida como historia de disnea con presencia de un cociente $FEV_1/FVC < 0,7$ y FEV1 < 80% tras prueba broncodilatadora.

Para cada enfermo se recogen datos

- Demográficos (edad y sexo).
- Antecedentes (tabaquismo, ingresos previos….).
- Comorbilidades (índice de Charlson, HTA, OP, ETE, etc).
- Datos clínicos y analíticos.
- Datos funcionales (escala de disnea, test de 6 minutos)
- Consumo de recursos sanitarios durante el ingreso.
- Medicación previa, durante el ingreso y al alta.
- Diagnósticos, causa de alta, estancia y lugar de control.

Resultados ECCO. Sexo y edad.

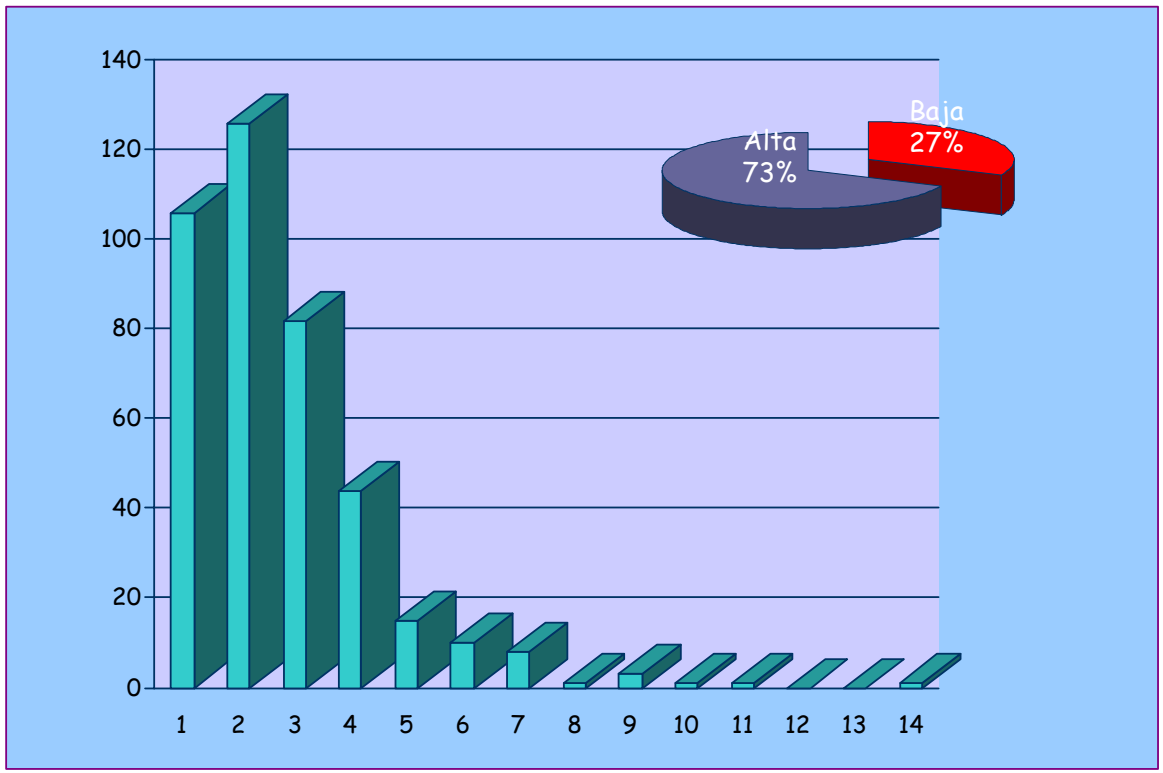


Edad		
Grupos	n	%
< 60 años	29	7,3
60-69 años	76	19,1
70-79 años	186	46,7
> 80 años	107	26,9
	398	100

Resultados ECCO. FEV1

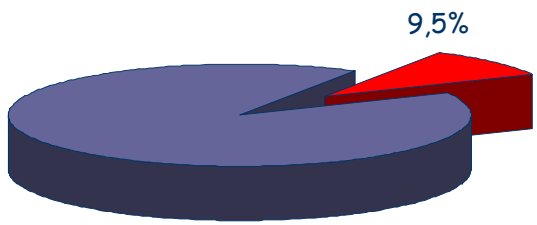
Estadio GOLD	FEV1	N	%
Moderado	≥50	132	33,2
Grave	30-49	213	53,5
Muy grave	< 30	53	13,3

Resultados ECCO. Indice de Charlson.



Prevalencia de osteoporosis. ECCO

38 pacientes, 27 varones y 11 mujeres, con diagnóstico de osteoporosis en el estudio ECCO.



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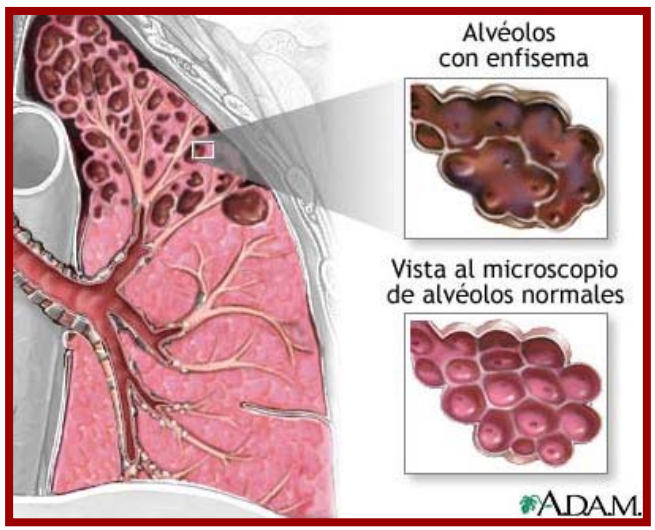
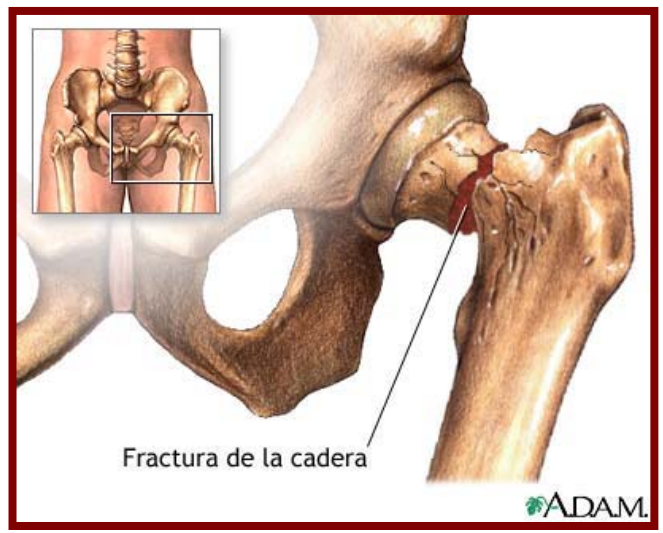

Alvéolos
con enfisema
Vista al microscopio
de alvéolos normales
A.D.A.M.


Fractura de la cadera
A.D.A.M.

?

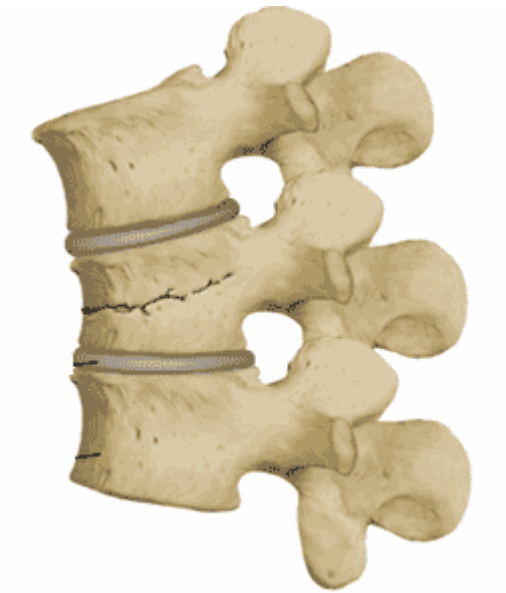
Fractura vertebral y EPOC

Prevalencia 26,8 %

Papaioannou A et al. Prevalence of vertebral fractures among patients with chronic obstructive pulmonary disease in Canada. Osteoporos Int 2003; 14: 913-917.

Asociación entre gravedad de la EPOC y prevalencia de fractura

Nuti R A et al. Vertebral fractures in patients with chronic obstructive pulmonary disease: the EOLO Study. Osteoporos Int 2008; Oct 18 [Epub ahead of print].



Prevalencia de osteoporosis en EPOC

Osteoporosis in Pulmonary Clinic Patients*

Does Point-of-Care Screening Predict Central Dual-Energy X-ray Absorptiometry?

Robert A. Adler, MD; Holly L. Funkhouser, MPH; Valentina I. Petkov, MD, MPH; Belinda L. Elmore, PharmD; Patricia S. Via, ANP, MS; Cynthia T. McMurtry, MD; and Tilahun Adera, PhD

Results: Of 98 subjects, 24.5% had a spine, total hip, or femoral neck (FN) T-score of ≤ −2.5, which is the generally accepted definition of osteoporosis diagnosed using DXA, and 44.9% had a T-score of ≤ −2.0. The best-fit models for predicting FN or total hip BMD included body weight, heel BMD, corticosteroid use for ≥ 7 days, and race, which accounted for 52 to 57% of the variance. When a heel

heel BMD testing and filled out a questionnaire. Ninety-eight men underwent a central DXA.
Results: Of 98 subjects, 24.5% had a spine, total hip, or femoral neck (FN) T-score of ≤ −2.5, which is the generally accepted definition of osteoporosis diagnosed using DXA, and 44.9% had a T-score of ≤ −2.0. The best-fit models for predicting FN or total hip BMD included body weight, heel BMD, corticosteroid use for ≥ 7 days, and race, which accounted for 52 to 57% of the variance. When a heel ultrasound T-score of −1.0 was tested to predict a central DXA T-score of −2.0, the sensitivity was 61% and the specificity 64%. Adding the questionnaire score and body mass index (BMI) to the heel T-score improved sensitivity but not specificity. Moreover, BMI and age predicted central BMD with similar sensitivity and specificity. Importantly, of 24 patients with a central DXA T-score of ≤ −2.5, only 14 were identified by a heel T-score of ≤ −1.0.
Conclusions: Although the findings from a heel ultrasound plus the answers to a questionnaire were reasonably good indicators for predicting the presence of low BMD, little predictability was gained over the use of BMI and age. In a group of pulmonary clinic patients, the prevalence of osteoporosis was clinically significant, and central DXA testing was the preferable technique for identifying patients who were at risk for fracture. *(CHEST 2003; 123:2012–2018)*

Key words: bone density; densitometry; lung diseases; osteoporosis; questionnaires; radiograph; ultrasonography

Abbreviations: BMD = bone mineral density; BMI = body mass index; BUA = broadband ultrasound attenuation; CI = confidence interval; DXA = dual-energy x-ray absorptiometry; FN = femoral neck; QUI = quantitative ultrasound index; ROC = receiver operating characteristics; RR = relative risk; SOS = speed of sound

Prevalencia de osteoporosis en EPOC

Prevalencia de osteoporosis en pacientes con enfermedad pulmonar obstructiva crónica.

Galofré N et al.

79 pacientes

Edad 70,1 ± 7,7. FEV1 < 50% (35 ± 8). Tabaco > 20 años paquete

Prevalencia 62 %

The Risk of Osteoporosis in Caucasian Men and Women with Obstructive Airways Disease

Don D. Sin, MD, MPH, Jonathan P. Man, S. F. Paul Man, MD

PURPOSE: Because patients with obstructive airways disease may be susceptible to osteoporosis, we sought to determine the association between airflow obstruction and osteoporosis.

SUBJECTS AND METHODS: We analyzed data from Caucasian participants (n = 9502) in the Third National Health and Nutrition Examination Survey, conducted in the United States between 1988 and 1994. We used data from dual-energy x-ray absorptiometry measurements of the total femur to determine whether a study participant had osteoporosis (defined as total bone mineral density values ≤2.5 SD below the corresponding mean values from young, healthy participants). We calculated the odds ratio (OR) for osteoporosis in four lung function categories: none, mild, moderate, and severe airflow obstruction.

RESULTS: Overall, airflow obstruction was associated with increased odds of osteoporosis compared with without airflow obstruction (OR = 1.9; 95% confidence interval [CI]: 1.4 to 2.5). Participants with severe airflow obstruction were at especially increased risk (OR = 2.4; 95% CI: 1.3 to 4.4). Moderate but not mild airflow obstruction was also associated with osteoporosis.

CONCLUSION: Airflow obstruction was an important risk factor for osteoporosis in the study population. These data highlight the importance of measuring bone mineral density in those with moderate-to-severe airflow obstruction for the detection and prevention of osteoporosis-related morbidity. **Am J Med. 2003;114:10–14.**

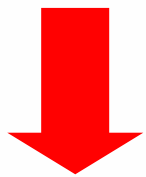
Table 2. The Prevalence of Osteopenia and Osteoporosis As Measured in the Total Femur in Caucasian Men and Women with and without Airflow Obstruction

	Severity of Airflow Obstruction				*P* for Trend*
	None	Mild	Moderate	Severe	
	Number (%)				
Women					
Number of participants	4287	242	235	79	
Osteopenia	1588 (37.0)	102 (42.1)	134 (57.0)	60 (76)	0.005
Osteoporosis	327 (7.6)	25 (10.3)	49 (20.9)	26 (33)	0.005
Men					
Number of participants	3993	310	263	93	
Osteopenia	1013 (25.4)	125 (40.3)	112 (42.6)	56 (60)	0.005
Osteoporosis	74 (1.9)	12 (3.9)	18 (6.8)	10 (11)	0.005

* *P* values reflect linear trend across the lung function categories starting from "none" to "severe."

Table 3. Associations between Airflow Obstruction and Hip Osteoporosis and Osteopenia of the Total Femur*

Category	Osteoporosis		Osteopenia	
	Odds Ratio (95% Confidence Interval)	*P* for Trend†	Odds Ratio (95% Confidence Interval)	*P* for Trend†
Normal	Reference	0.005	Reference	0.005
Mild airflow obstruction	1.3 (0.8 to 2.1)		0.9 (0.7 to 1.1)	
Moderate airflow obstruction	2.1 (1.4 to 3.3)		1.3 (0.9 to 1.7)	
Severe airflow obstruction	2.4 (1.3 to 4.4)		1.7 (1.0 to 2.6)	



* Adjusted for age, smoking status, medications, physical activity, and body mass index (see Methods).

† *P* values reflect linear trend across the lung function categories starting from "none" to "severe."

Estudio ECCO
(Epoc con comorbilidad)
Resultados

Riesgo de osteoporosis en varones con EPOC

Male Osteoporosis Risk Estimation Score (MORES)	
Factor de riesgo	Puntuación
Edad ≤ 55 años 56-74 años ≥ 75 años	 0 3 4
Peso ≤ 70 kg 70-80 kg > 80 kg	 6 4 0
EPOC	3

Hacer screening si ≥ 6 puntos

Male Osteoporosis Risk Estimation Score (MORES)	
Sensibilidad	0,93 (0,85-0,97)
Especificidad	0,59 (0,56-0.62)
Area bajo la curva	0,832 (0,807-0,858)

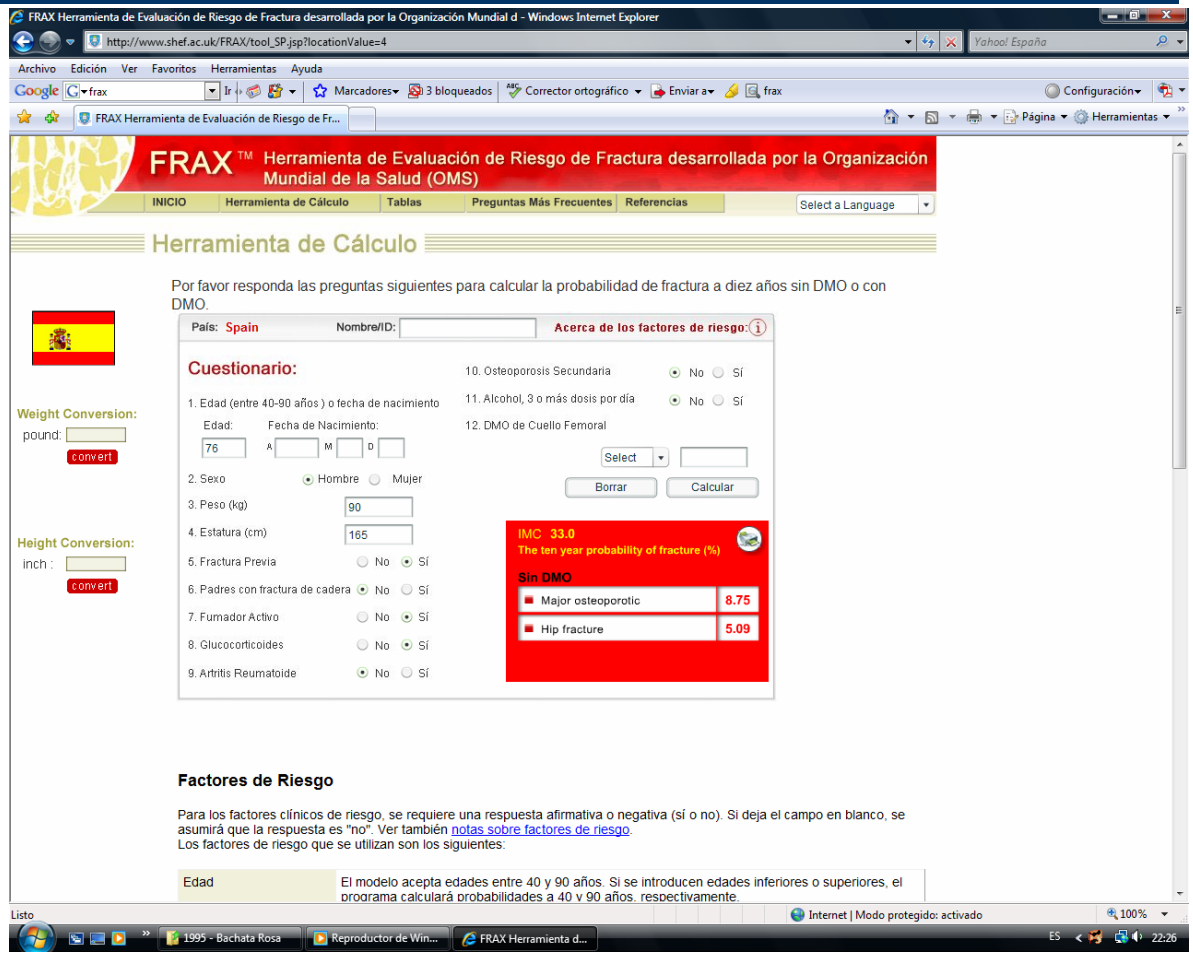
Shepherd AJ et al. Development and internal validation of a male osteoporosis risk estimation score. Ann Fam Med 2007; 5: 540-6.

Riesgo de osteoporosis y de fractura en varones con EPOC

MORES		
Puntuación	Frecuencia	%
3	1	0,28
6	41	11,61
7	45	12,75
9	6	1,70
10	49	13,88
11	67	18,98
12	60	17,00
13	84	23,80
	353	100

99,72 %
precisan screening

FRAX - Evaluación riesgo fractura OMS



Factores de riesgo

Factor de riesgo	Varones		Mujeres		Total	
	n	%	n	%	n	%
Fractura previa	3	0,8	0	0,0	3	0,7
Fractura de cadera en los padres	0	0,0	0	0,0	0	0,0
Tabaco	262	74,2	13	28,9	275	69,1
Alcohol	55	15,6	1	2,2	56	14,1
Corticoides	171	48,4	26	57,8	197	49.5
Artritis reumatoide	1	0,28	0	0,0	1	0,2
Osteoporosis secundaria	37	10,5	1	2,2	38	9,5

Riesgo de fractura osteoporótica en pacientes con EPOC

Riesgo a 10 años de fractura - FRAX				
	Varones		Mujeres	
	Media	DE	Media	DE
Fractura osteoporótica mayor	5,43	2,61	10,95	6,51
Fractura de cadera	3,42	3,98	5,34	4,64

	Riesgo a 10 años de fractura - FRAX		
	Varones	Mujeres	Total
Fractura osteoporótica mayor	19	5	24
Fractura de cadera	11	2	13

Riesgo de fractura osteoporótica mayor en pacientes con EPOC

La NOF recomienda tratamiento en pacientes > 50 años con masa ósea baja (T score -1 a -2,5) y probabilidad de fractura osteoporótica ≥ 20% en los próximos 10 años basado en el FRAX.

Riesgo a 10 años de fractura osteoporótica - FRAX						
	Varones		Mujeres		Total	
Probabilidad	Frecuencia	%	Frecuencia	%	Frecuencia	%
< 10	327	94,0	23	51,1	350	89,0
10-20	21	6,0	18	40,0	39	9,9
> 20	0	0	4	8,9	4	1,0
	348	100	45	100	393	100

Riesgo de fractura de cadera en pacientes con EPOC

La NOF recomienda tratamiento en pacientes > 50 años con masa ósea baja (T score -1 a -2,5) y probabilidad de fractura de cadera ≥ 3% en los próximos 10 años basado en el FRAX.

Riesgo a 10 años de fractura cadera - FRAX						
	Varones		Mujeres		Total	
Probabilidad	Frecuencia	%	Frecuencia	%	Frecuencia	%
< 3	180	51,7	17	37,8	197	50,1
3,00-5,99	129	37,1	14	31,1	143	36,4
6,00-8,99	33	9,5	4	8,9	37	9,4
≥ 9,00	6	1,7	10	22,2	16	4,1
	348	100	45	100	393	100

49,9 %
tienen riesgo alto

Osteoporosis en pacientes con EPOC

- No hay asociación entre el nivel de obstrucción (FEV1-estadio GOLD) y prevalencia de osteoporosis o riesgo de fractura.

- No hay asociación entre mayor comorbilidad y prevalencia de osteoporosis o riesgo de fractura.

Osteoporosis in pulmonary clinic patients: does point-of-care screening predict central dual-energy X-ray absorptiometry?

Adler Ra et al. Section of Endocrinology, Medical Service, McGuire Veterans Affairs Medical Center, Richmond, VA 23249, USA.

STUDY OBJECTIVES: Patients in a pulmonary clinic have disorders that predispose them to osteoporosis and may use glucocorticoid therapy, which has been associated with low bone mineral density (BMD) and increased fracture risk. Ideally, all patients at risk for osteoporosis would be screened using the best test available, which is central BMD by dual-energy x-ray absorptiometry (DXA). We proposed to stratify the risk for osteoporosis by the use of a simple questionnaire and point-of-care heel ultrasound BMD measurements. DESIGN: Cross-sectional screening study. SETTING: Pulmonary clinic in a single Veterans Affairs Medical Center. PATIENTS: Approximately 200 male and female patients who had not had previous BMD testing were eligible for the study, and 107 gave consent. INTERVENTIONS: One hundred seven men (white, 71 men; black, 35 men; and Asian, 1 man) underwent heel BMD testing and filled out a questionnaire. Ninety-eight men underwent a central DXA. RESULTS: Of 98 subjects, 24.5% had a spine, total hip, or femoral neck (FN) T-score of <or= -2.5, which is the generally accepted definition of osteoporosis diagnosed using DXA, and 44.9% had a T-score of <or= -2.0. The best-fit models for predicting FN or total hip BMD included body weight, heel BMD, corticosteroid use for >or= 7 days, and race, which accounted for 52 to 57% of the variance. When a heel ultrasound T-score of -1.0 was tested to predict a central DXA T-score of -2.0, the sensitivity was 61% and the specificity 64%. Adding the questionnaire score and body mass index (BMI) to the heel T-score improved sensitivity but not specificity. Moreover, BMI and age predicted central BMD with similar sensitivity and specificity. Importantly, of 24 patients with a central DXA T-score of <or= -2.5, only 14 were identified by a heel T-score of <or= -1.0. CONCLUSIONS: Although the findings from a heel ultrasound plus the answe[illegible] reasonably good indicators for predicting the presence of low BMD, little predictability was gained over the [illegible]monary clinic patients, the prevalence of osteoporosis was clinically significant, and central DXA t[illegible] identifying patients who were at risk for fracture. .

51,4 %
> 65 años

Chest 2003; 123: 2012-2018.

The risk of osteoporosis in Caucasian men and women with obstructive airways disease.

Sin DD et al. Division of Pulmonary Medicine, University of Alberta, Edmonton, Alberta, Canada.

PURPOSE: Because patients with obstructive airways disease may be susceptible to osteoporosis, we sought to determine the association between airflow obstruction and osteoporosis. SUBJECTS AND METHODS: We analyzed data from Caucasian participants (n = 9502) in the Third National Health and Nutrition Examination Survey, conducted in the United States between 1988 and 1994. We used data from dual-energy x-ray absorptiometry measurements of the total femur to determine whether a study participant had osteoporosis (defined as total bone mineral density values < or =2.5 SD below the corresponding mean values from young, healthy participants). We calculated the odds ratio (OR) for osteoporosis in four lung function categories: none, mild, moderate, and severe airflow obstruction. RESULTS: Overall, airflow obstruction was associated with increased odds of osteoporosis compared with without airflow obstruction (OR = 1.9; 95% confidence interval [CI]: 1.4 to 2.5). Participants with severe airflow obstruction were at especially increased risk (OR = 2.4; 95% CI: 1.3 to 4.4). Moderate but not mild airflow obstruction was also associated with osteoporosis. CONCLUSION: Airflow obstruction was an important risk factor for osteoporosis in the study population. These data highlight the importance of measuring bone mineral density in those with moderate-to-severe airflow obstruction for the detection and prevention of osteoporosis-related morbidity.

Am J Med 2003; 114: 10-14.

Edad media
57,8 años

African Americans and Men with Severe COPD Have a High Prevalence of Osteoporosis

Lihua L et al. Division of Pulmonary and Critical Care, Temple University School of Medicine, Philadelphia, Pennsylvania, USA

Osteoporosis is a non-pulmonary manifestation whose true prevalence is uncertain in severe chronic obstructive pulmonary disease (COPD). We describe the prevalence and risk factors for osteoporosis in a large, well characterized COPD cohort. Dual energy x-ray absorptiometry of the lumbar spine and hip, full pulmonary function testing, cardiopulmonary exercise test, 6 minute walk distance and demographics were performed in 179 non-selected COPD patients. Patients were 59 ± 7 years old, smoked 53 ± 32 pack years, FEV1 26% ± 9.8, and 45% were currently taking prednisone. Bone mineral density measurements were abnormal in 97%; 66% had dual energy X-ray absorptiometry defined osteoporosis, while 31% had osteopenia. The prevalence of osteoporosis in males versus females was 70% versus 62% (p = 0.33); both groups had similar fracture rates. The prevalence of osteoporosis in African Americans versus Caucasians was 69% versus 65% (p = 0.78). Caucasians had a significantly lower Ward's Triangle T score than African Americans (-2.52 ± -0.96 vs. -2.16 ± -0.91, p = 0.04). Those with bone fractures took higher doses of prednisone than those without fractures. Univariate analysis identified BMI and FVC% as predictors for osteoporosis (p = 0.03 OR 0.934 p = 0.006 OR 0.974). Multivariate analysis revealed only FVC% as a significant predictor (p = 0.006, OR 0.974). Osteoporosis is highly [illegible] COPD, and affects males and African Americans to a similar degree as females and Whites. [illegible] in severe COPD regardless of race or gender.

COPD 2008; 5: 291-297.

Edad media
59 ± 7 años