

Flúor: ¿tiene alguna chance como tratamiento de la osteoporosis?

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Osteoporosis. Tratamiento

Formadores de hueso

Parathormona (1-34)

Parathormona (1-84)

Flúor

Ranelato de estroncio

Antirresortivos

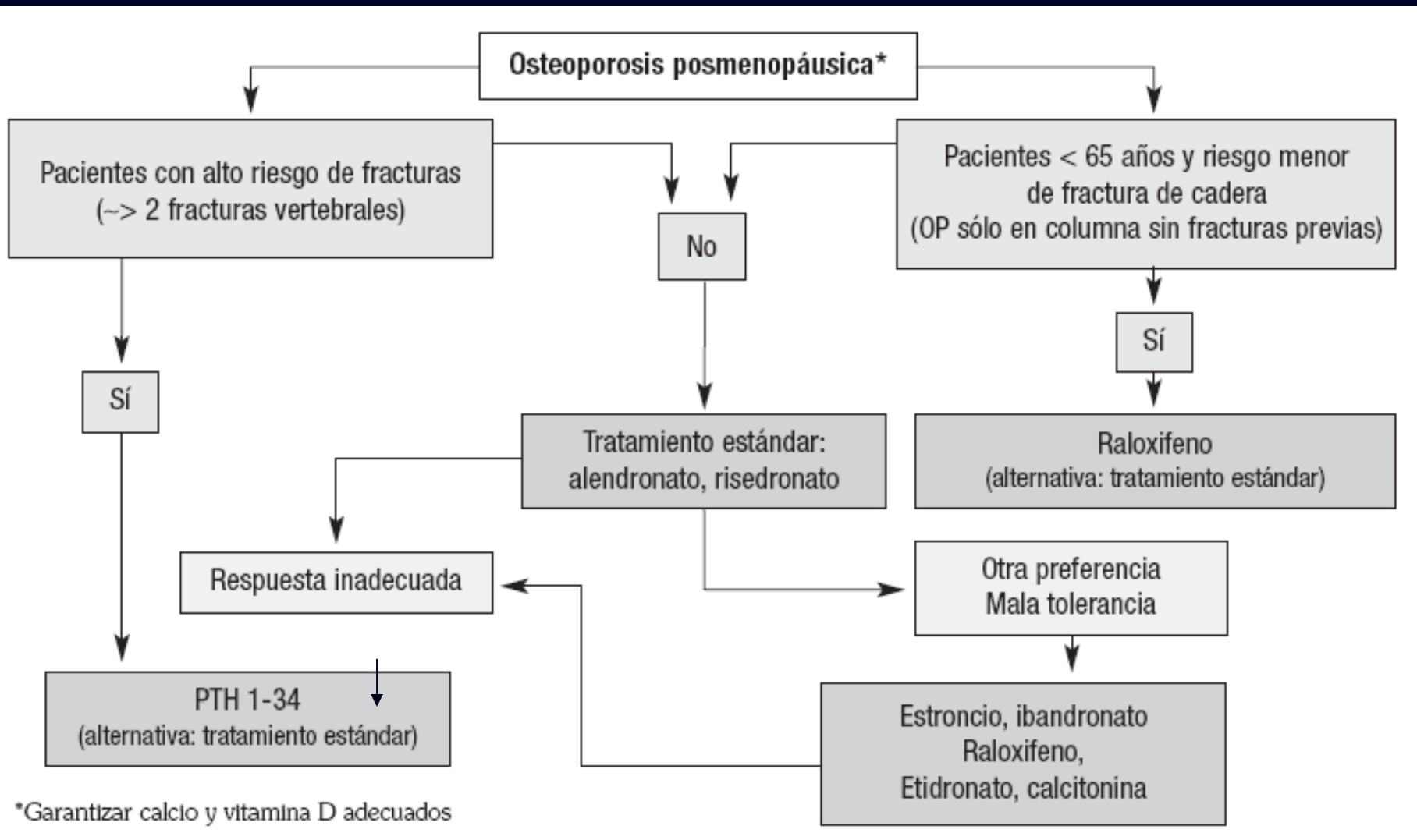
Bifosfonatos

Raloxifeno

Calcitonina

THS

Guía de Práctica clínica de la SEIOMM



Todas las sustancias son veneno.
No hay ninguna que no lo sea. La
dosis correcta es lo que diferencia
a un veneno de un remedio

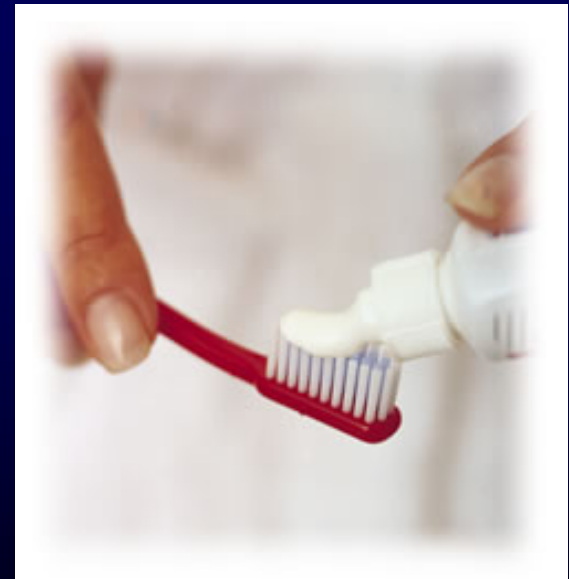


Paracelso
1493-1541

Flúor. Historia

A dosis alta puede ser mortal

A dosis bajas: 1-2 mg/día previene la caries dental



Flúor. Historia

Flúor en el agua: Ampliamente utilizado en EEUU

Motivo de debate en Europa y España

Efecto beneficioso sobre las caries

¿Negativo sobre el cáncer?

¿Negativo sobre el hipotiroidismo?

¿Efecto sobre las fracturas?

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Effect of Long-Term Exposure to Fluoride in Drinking Water on Risks of Bone Fractures

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ABSTRACT

Findings on the risk of bone fractures associated with long-term fluoride exposure from drinking water have been contradictory. The purpose of this study was to determine the prevalence of bone fracture, including hip fracture, in six Chinese populations with water fluoride concentrations ranging from 0.25 to 7.97 parts per million (ppm). A total of 8266 male and female subjects ≥ 50 years of age were enrolled. Parameters evaluated included fluoride exposure, prevalence of bone fractures, demographics, medical history, physical activity, cigarette smoking, and alcohol consumption. The results confirmed that drinking water was the only major source of fluoride exposure in the study populations. A U-shaped pattern was detected for the relationship between the prevalence of bone fracture and water fluoride level. The prevalence of overall bone fracture was lowest in the population of 1.00–1.06 ppm fluoride in drinking water, which was significantly lower ($p < 0.05$) than that of the groups exposed to water fluoride levels ≥ 4.32 and ≤ 0.34 ppm. The prevalence of hip fractures was highest in the group with the highest water fluoride (4.32–7.97 ppm). The value is significantly higher than the population with 1.00–1.06 ppm water fluoride, which had the lowest prevalence rate. It is concluded that long-term fluoride exposure from drinking water containing ≥ 4.32 ppm increases the risk of overall fractures as well as hip fractures. Water fluoride levels at 1.00–1.06 ppm decrease the risk of overall fractures relative to negligible fluoride in water; however, there does not appear to be similar protective benefits for the risk of hip fractures. (J Bone Miner Res 2001;16:932–939)

Key words: fluoride, fluoridation, bone, fracture

INTRODUCTION

FLUORINE is ubiquitous in our environment, and it is the most electronegative and reactive of all elements.⁽¹⁾ Historically, the association between fluoride and prevention of dental caries was first recognized in the 1930s; in studies on chronic endemic dental fluorosis. It was noted that people

living in communities with a natural fluoride content of 1 part per million (ppm) or more in drinking water had about 50% fewer dental caries than those with water containing 0.1–0.3 ppm fluoride.^(2,3) Subsequently, several independently conducted studies in the 1940s confirmed the cariostatic efficacy of fluoride.^(4–7) Based on these findings, it was suggested that drinking water be fluoridated to an

Flúor. Historia

A dosis altas (8- 80 mg/día) en áreas producen fluorosis



Estudios con resultados negativos

Effect of fluoride treatment on the fracture rate in postmenopausal women with osteoporosis

Método:

202 mujeres

75 mg/día de FINa

Suplemento de calcio 1500 mg/día.

Completaron el estudio: 66 en el grupo tratado y 69 en el grupo control

Riggs BL et al: Effect of fluoride treatment on the fracture rate in postmenopausal women with osteoporosis. N Engl J Med 1990;322:802-9



Estudios con resultados negativos

Densidad mineral ósea

35% aumento en CL

12% aumento cuello femoral

-4% en radio

Fracturas

No diferencias en FV

Aumento de las FNV: 72 grupo tratado y 24 en el control. $p= 0.02$



Estudios con resultados positivos en parte



Ensayo clínico a 4 años

Método:

200 mujeres con OP: 100 tratadas con 20 mg MFP y 100 con placebo. Todas Calcio: 1000 mg/día

Resultados:

Aumento de la DMO en CL. No diferencias en CF.

Descenso nº FV: 2.4% grupo tratado y 10% placebo

No efecto en FNV: 15 FNV en grupo tratado y 13 en el placebo

The effect of sodium monofluorophosphate plus calcium on vertebral fracture rate in postmenopausal women with moderate osteoporosis. A randomized, controlled trial. Reginster JY et al. Ann Intern Med, 1998; 129: 1 - 8.

Estudios con resultados positivos

50 mg/día 12 meses y 2 de descanso
Comprimidos con liberación retardada
Monofluorofosfato (MFP)

54 mujeres con OPM tratadas. Acabaron 48
56 controles. Acabaron 51. Seguimiento 4 años

Pak CYC et al: Treatment of Postmenopausal Osteoporosis with Slow-Release Sodium Fluoride: Final Report of a Randomized Controlled Trial. Ann Intern Med 1995;123:401-8

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IN THE CLINIC
Dyslipidemia ITCB-1

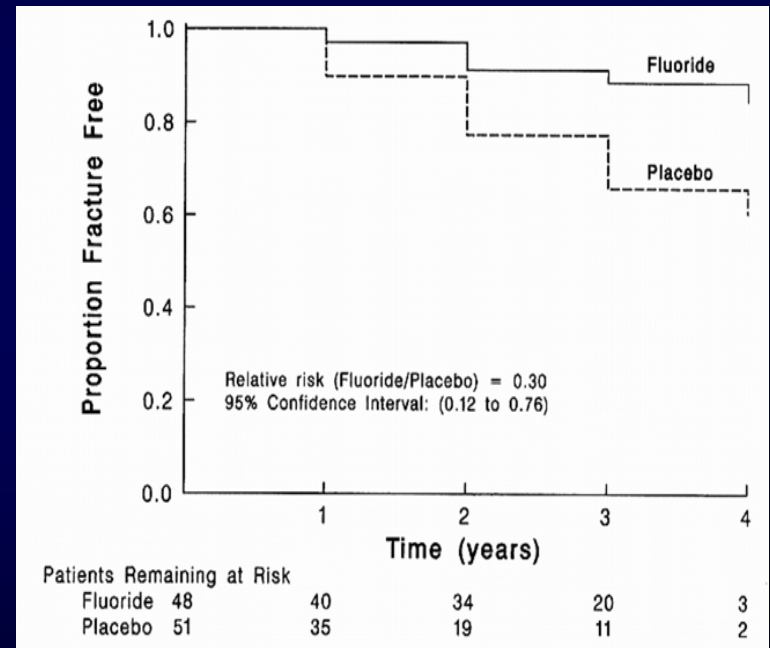
Estudios con resultados positivos

Aumento de la DMO CL: 4%-5%

Aumento CF: 2.3%

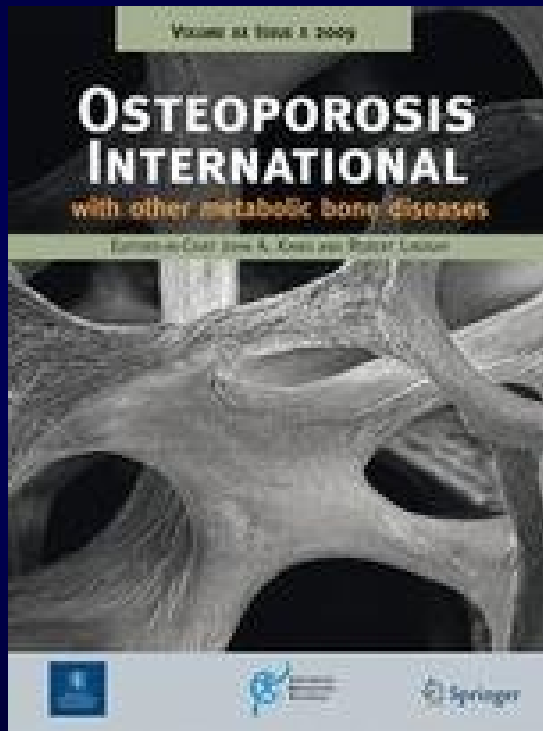
Sin cambios en antebrazo

Fracturas vertebrales:
Reducción del RR FV: 70%



Pak CYC et al: Treatment of Postmenopausal Osteoporosis with Slow-Release Sodium Fluoride: Final Report of a Randomized Controlled Trial. Ann Intern Med 1995;123:401-8

Efecto del tratamiento con flúor en la DMO y en el riesgo de fractura. Un metaanálisis



Osteoporos Int (2008) 19:257–268
DOI 10.1007/s00198-007-0437-6

REVIEW

Effects of treatment with fluoride on bone mineral density and fracture risk - a meta-analysis

P. Vestergaard • N. R. Jorgensen • P. Schwarz •
L. Mosekilde

Vestergaard P et al: Effect of treatment with fluoride on bone mineral density and fracture risk: a meta-analysis. Osteoporos Int 2008;19:257-268

Efecto del tratamiento con flúor en la DMO y en el riesgo de fractura. Un metaanálisis

Método: Análisis sistemático de PubMed, ISI Web of Science y Embase
2.028 referencias
25 estudios elegidos

Resultados:

DMO: CL: Aumento 7.9% (IC 95%: 5.4 – 10.5%)
Cuello femoral: Aumento 2.1% (IC 95%: 0.9 – 3.4%)

Vestergaard P et al: Effect of treatment with fluoride on bone mineral density and fracture risk: a meta-analysis. *Osteoporos Int* 2008;19:257-268

Efecto del tratamiento con flúor en la DMO y en el riesgo de fractura. Un metaanálisis

Resultados. En fracturas

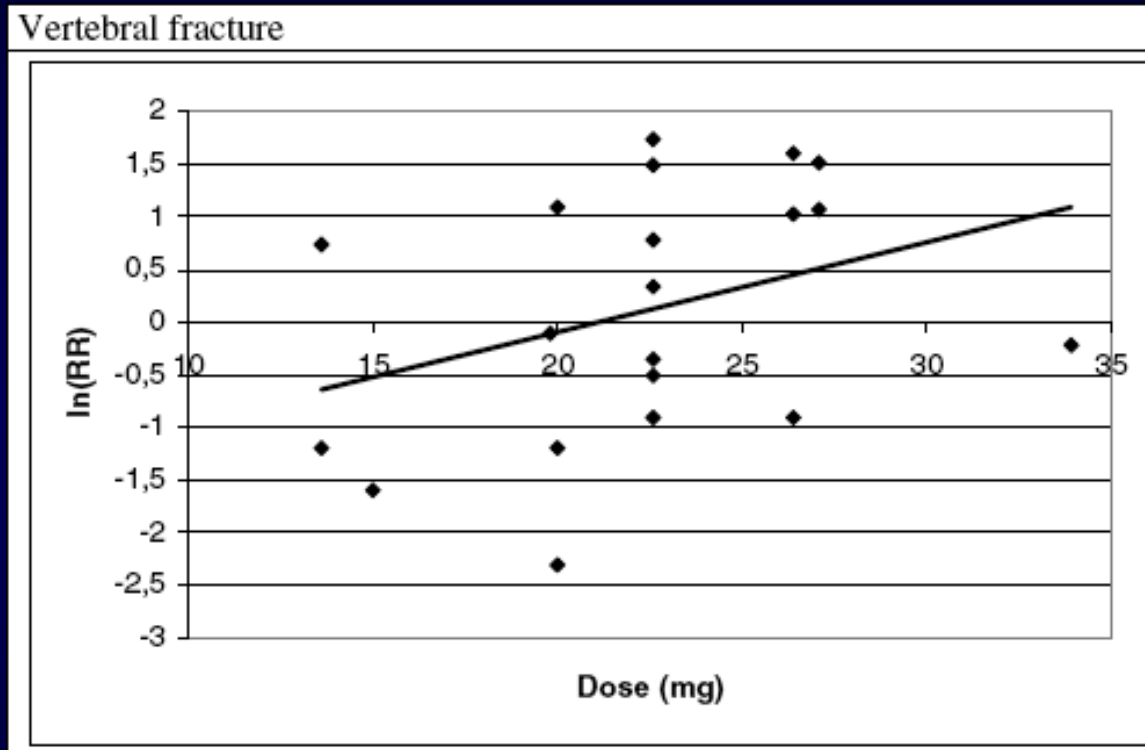
En su conjunto:

Reducción RR FV: 0.8 (IC 95: 0.5 – 1.5)

Reducción RR FNV: 0.8 (IC 95%: 0.5 -1.4%)

Vestergaard P et al: Effect of treatment with fluoride on bone mineral density and fracture risk: a meta-analysis. *Osteoporos Int* 2008;19:257-268

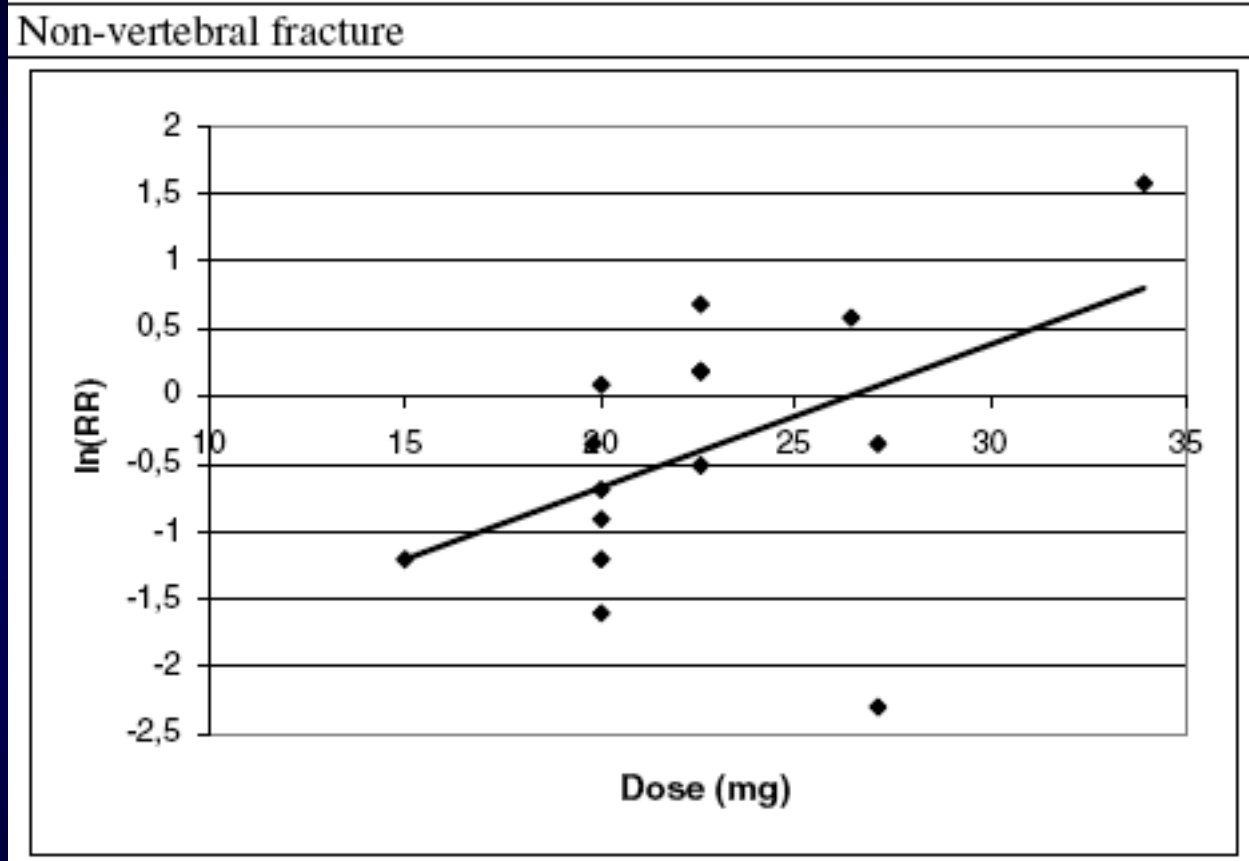
Metaanálisis. Flúor. Vestergaard 2008



FINa:
< 20 mg/día

Vestergaard P et al: Effect of treatment with fluoride on bone mineral density and fracture risk: a metaanalysis. Osteoporos Int 2008;19:257-268

Metaanálisis. Flúor. Vestergaard 2008



FINa:
< 20 mg/día

Vestergaard P et al: Effect of treatment with fluoride on bone mineral density and fracture risk: a metaanalysis. *Osteoporos Int* 2008;19:257-268

Efecto del tratamiento con flúor en la DMO y en el riesgo de fractura. Un metaanálisis

Resultados. En fracturas

Estudios con dosis superiores a 20 mg/día:

Reducción RR FV: 1.3 (IC 95: 0.8 – 2)

Reducción RR FNV: 1.5 (IC 95%: 0.8 – 2.8)

Vestergaard P et al: Effect of treatment with fluoride on bone mineral density and fracture risk: a meta-analysis. *Osteoporos Int* 2008;19:257-268

Efecto del tratamiento con flúor en la DMO y en el riesgo de fractura. Un metaanálisis

Resultados. En fracturas.

Estudios con dosis inferiores a 20 mg/día:

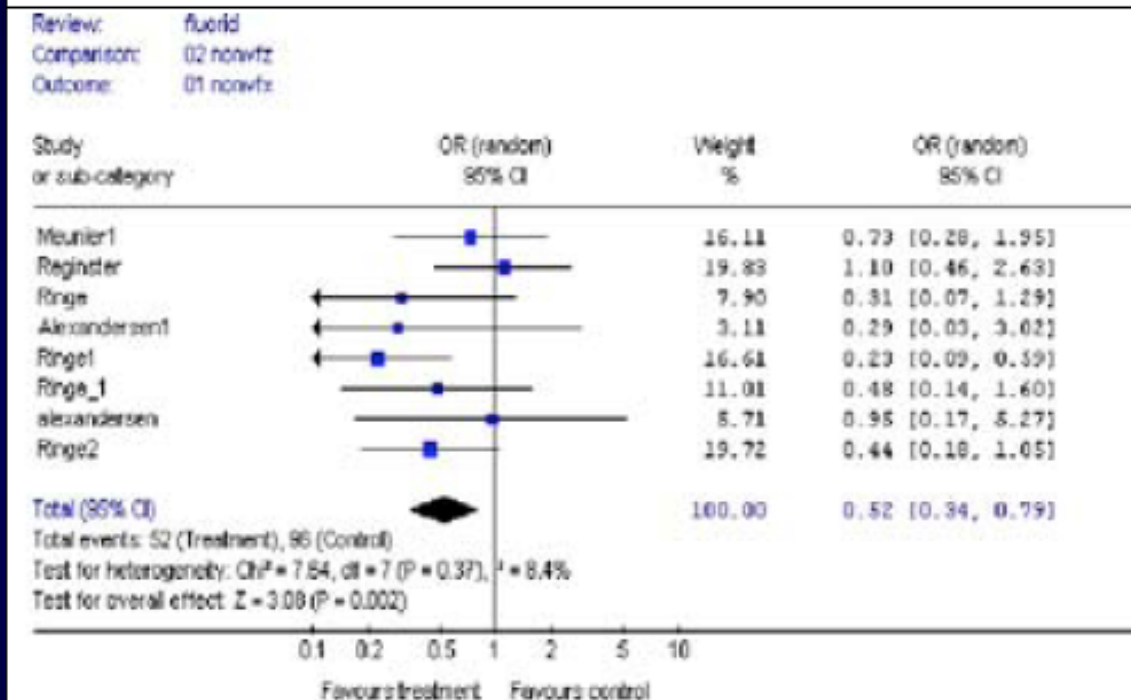
Reducción RR FV: 0.28 (IC 95: 0.09 – 0.87)

Reducción RR FNV: 0.5 (IC 95%: 0.3 – 0.8)

Vestergaard P et al: Effect of treatment with fluoride on bone mineral density and fracture risk: a meta-analysis. *Osteoporos Int* 2008;19:257-268

Metaanálisis. Flúor. Vestergaard 2008

Non vertebral fractures



FINa:
< 20 mg/día

FNV: OR: 0.52 (0.34 – 0.79)

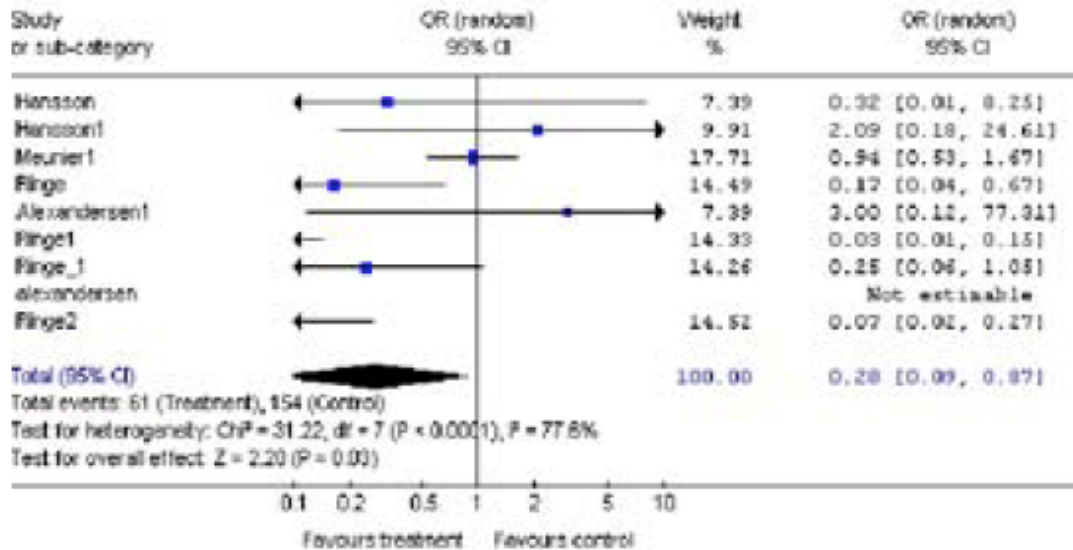
Vestergaard P et al: Effect of treatment with fluoride on bone mineral density and fracture risk: a metanalysis. Osteoporos Int 2008;19:257-268

Metaanálisis. Flúor. Vestergaard 2008

Vertebral fractures

Forest plots

Review: Fluorid
 Comparison: 01 vfx
 Outcome: 01 vfx



FINa:
 < 20 mg/día

RR FV: OR: 0.28 (0.09 -0.87)

Vestergaard P et al: Effect of treatment with fluoride on bone mineral density and fracture risk: a metanalysis. Osteoporos Int 2008;19:257-268

Conclusiones

1. El fluoruro sódico utilizado a dosis inferiores a 20 mg/día produce una disminución del riesgo de fracturas

a) Vertebrales: 72%

b) No vertebrales: 50%

2. Datos obtenidos de un metaanálisis.

Nivel de evidencia 1A.

Grado de recomendación A