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## LITERATÚRA

- Mirza F, Canalis E. Management of endocrine disease: Secondary osteoporosis: pathophysiology and management. *European journal of endocrinology / European Federation of Endocrine Societies*. 2015;173(3):R131-51.
- Hans D, Goertzen AL, Krieg MA, et al. Bone microarchitecture assessed by TBS predicts osteoporotic fractures independent of bone density: the Manitoba study. *J Bone Miner Res*. 2011;26(11):2762-9.
- Briot K, Paternotte S, Kolta S, et al. Added value of trabecular bone score to bone mineral density for prediction of osteoporotic fractures in postmenopausal women: the OPUS study. *Bone*. 2013;57(1):232-6.
- Boutroy S, Hans D, Sornay-Rendu E, et al. Trabecular bone score improves fracture risk prediction in non-osteoporotic women: the OFELY study. *Osteoporosis international: a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*. 2013;24(1):77-85.
- McCloskey EV, Oden A, Harvey NC, et al. A Meta-Analysis of Trabecular Bone Score in Fracture Risk Prediction and Its Relationship to FRAX. *J Bone Miner Res*. 2016;31(5):940-8.
- Rosen T, Wires L, Wilhelmsen L, et al. Decreased psychological well-being in adult patients with growth hormone deficiency. *ClinEndocrinol(Oxf)*. 1994;40(1):111-6.
- Arwert LJ, Deijen JB, Muller M, et al. Long-term growth hormone treatment preserves GH-induced memory and mood improvements: a 10-year follow-up study in GH-deficient adult men. *HormBehav*. 2005;47(3):343-9.
- Touskova V, Klouckova J, Durovcova V, et al. The possible role of mRNA expression changes of GH/IGF-1/insulin axis components in subcutaneous adipose tissue in metabolic disturbances of patients with acromegaly. *Physiological research*. 2016;65(3):493-503.
- Conway GS, Szarras-Czapnik M, et al. Treatment for 24 months with recombinant human GH has a beneficial effect on bone mineral density in young adults with childhood-onset GH deficiency. *EurJ Endocrinol*. 2009;160(6):899-907.
- Elbornsson M, Gotherstrom G, Franco C, et al. Effects of 3-year GH replacement therapy on bone mineral density in younger and elderly adults with adult-onset GH deficiency. *EurJ Endocrinol*. 2012;166(2):181-9.
- Rota F, Savanelli MC, Tauchmanova L, et al. Bone density and turnover in young adult patients with growth hormone deficiency after 2-year growth hormone replacement according with gender. *J EndocrinolInvest*. 2008;31(2):94-102.
- Krantz E, Trimpou P, Landin-Wilhelmsen K. Effect of Growth Hormone Treatment on Fractures and Quality of Life in Postmenopausal Osteoporosis: A 10-Year Follow-Up Study. *J Clin Endocrinol Metab*. 2015;100(9):3251-9.
- Mo D, Fleseriu M, Qi R, Jia N, et al. Fracture risk in adult patients treated with growth hormone replacement therapy for growth hormone deficiency: a prospective observational cohort study. *Lancet Diabetes Endocrinol*. 2015;3(5):331-8.
- Appelman-Dijkstra NM, Claessen KM, Hamdy NA, et al. Effects of up to 15 years of recombinant human GH (rhGH) replacement on bone metabolism in adults with growth hormone deficiency (GHD): the Leiden Cohort Study. *Clin Endocrinol (Oxf)*. 2014;81(5):727-35.
- Barake M, Klibanski A, Tritos NA. Effects of recombinant human growth hormone therapy on bone mineral density in adults with growth hormone deficiency: a meta-analysis. *J Clin Endocrinol Metab*. 2014;99(3):852-60.
- Amato G, Carella C, Fazio S, et al. Body composition, bone metabolism, and heart structure and function in growth hormone (GH)-deficient adults before and after GH replacement therapy at low doses. *J ClinEndocrinolMetab*. 1993;77(6):1671-6.
- Degerblad M, Bengtsson BA, Brannert M, et al. Reduced bone mineral density in adults with growth hormone (GH) deficiency: increased bone turnover during 12 months of GH substitution therapy. *EurJ Endocrinol*. 1995;133(2):180-8.
- Jorgensen AP, Fougner KJ, Ueland T, et al. Favorable long-term effects of growth hormone replacement therapy on quality of life, bone metabolism, body composition and lipid levels in patients with adult-onset growth hormone deficiency. *Growth Horml-GFRes*. 2011;21(2):69-75.
- Elbornsson M, Gotherstrom G, Bosaeus I, et al. Fifteen years of GH replacement increases bone mineral density in hypopituitary patients with adult-onset GH deficiency. *EurJ Endocrinol*. 2012;166(5):787-95.
- Davidson P, Milne R, Chase D, et al. Growth hormone replacement in adults and bone mineral density: a systematic review and meta-analysis. *ClinEndocrinol(Oxf)*. 2004;60(1):92-8.
- Clanget C, Seck T, Hinke V, et al. Effects of 6 years of growth hormone (GH) treatment on bone mineral density in GH-deficient adults. *ClinEndocrinol(Oxf)*. 2001;55(1):93-9.
- Biermasz NR, Hamdy NA, Janssen YJ, et al. Additional beneficial effects of alendronate in growth hormone (GH)-deficient adults with osteoporosis receiving long-term recombinant human GH replacement therapy: a randomized controlled trial. *J ClinEndocrinol-Metab*. 2001;86(7):3079-85.
- Kuzma M, Kuzmova Z, Zelinkova Z, et al. Impact of the growth hormone replacement on bone status in growth hormone deficient adults. *Growth hormone & IGF research: official journal of the Growth Hormone Research Society and the International IGF Research Society*. 2014;24(1):22-8.
- Joseph F, Ahmad AM, Ul-Haq M, et al. Effects of growth hormone administration on bone mineral metabolism, PTH sensitivity and PTH secretory rhythm in postmenopausal women with established osteoporosis. *J Bone Miner Res*. 2008;23(5):721-9.
- Bereket A, Cesur Y, Ozkan B, et al. Circulating insulin-like growth factor binding protein-4 (IGFBP-4) is not regulated by parathyroid hormone and vitamin D in vivo: evidence from children with rickets. *Journal of clinical research in pediatric endocrinology*. 2010;2(1):17-20.
- Soliman AT, Al Khalaf F, Alhemaiddi N, et al. Linear growth in relation to the circulating concentrations of insulin-like growth factor I, parathyroid hormone, and 25-hydroxy vitamin D in children with nutritional rickets before and after treatment: endocrine adaptation to vitamin D deficiency. *Metabolism*. 2008;57(1):95-102.
- Gomez JM, Maravall FJ, Gomez N, et al. Relationship between 25-(OH) D3, the IGF-I system, leptin, anthropometric and body composition variables in a healthy, randomly selected population. *Hormone and metabolic research = Hormon- und Stoffwechselforschung = Hormones et metabolisme*. 2004;36(1):48-53.
- Bogazzi F, Rossi G, Lombardi M, et al. Vitamin D status may contribute to serum insulin-like growth factor I concentrations in healthy subjects. *Journal of endocrinological investigation*. 2011;34(8):e200-3.
- Halupczok-Zyla J, Jawarczyk-Przybylowska A, Bolanowski M. Patients with Active Acromegaly are at High Risk of 25(OH)D Deficiency. *Frontiers in endocrinology*. 2015;6:89.
- Ameri P, Giusti A, Boschetti M, et al. Vitamin D increases circulating IGF1 in adults: potential implication for the treatment of GH deficiency. *European journal of endocrinology / European Federation of Endocrine Societies*. 2013;169(6):767-72.
- Kuzma M, Binkley N, Bednarova A, et al. Trabecular Bone Score Change Differs with Regard to 25(OH)D Levels in Patients Treated for Adult-Onset Growth Hormone Deficiency. *Endocrine practice: official journal of the American College of Endocrinology and the American Association of Clinical Endocrinologists*. 2016;22(8):951-8.
- Vestergaard P, Mosekilde L. Fracture risk is decreased in acromegaly--a potential beneficial effect of growth hormone. *Osteoporosis international: a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*. 2004;15(2):155-9.
- Riggs BL, Randall RV, Wahner HW, et al. The nature of the metabolic bone disorder in acromegaly. *The Journal of clinical endocrinology and metabolism*. 1972;34(6):911-8.
- Kayath MJ, Vieira JG. Osteopenia occurs in a minority of patients with acromegaly and is predominant in the spine. *Osteoporosis international: a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*. 1997;7(3):226-30.
- Bonadonna S, Mazziotti G, Nuzzo M, et al. Increased prevalence of radiological spinal deformities in active acromegaly: a cross-sectional study in postmenopausal women. *Journal of bone and mineral research: the official journal of the American Society for Bone and Mineral Research*. 2005;20(10):1837-44.
- Mazziotti G, Bianchi A, Porcelli T, et al. Vertebral fractures in patients with acromegaly: a 3-year prospective study. *The Journal of clinical endocrinology and metabolism*. 2013;98(8):3402-10.
- Claessen KM, Kroon HM, Pereira AM, et al. Progression of vertebral fractures despite long-term biochemical control of acromegaly: a prospective follow-up study. *The Journal of clinical endocrinology and metabolism*. 2013;98(12):4808-15.
- Ueland T, Bollerslev J, Godang K, et al. Increased serum osteoprotegerin in disorders characterized by persistent immune activation or glucocorticoid excess--possible role in bone homeostasis. *European journal of endocrinology*. 2001;145(6):685-90.
- Stepan J, Marek J, Havranek T, et al. Bone isoenzyme of serum alkaline phosphatase in acromegaly. *Clínica chimica acta; international journal of clinical chemistry*. 1979;93(3):355-63.
- Scillitani A, Chiodini I, Carnevale V, et al. Skeletal involvement in female acromegalic subjects: the effects of growth hormone excess in amenorrheal and menstruating patients. *Journal of bone and mineral research: the official journal of the American Society for Bone and Mineral Research*. 1997;12(10):1729-36.
- Mazziotti G, Biagioli E, Maffezzoni F, et al. Bone turnover, bone mineral density, and fracture risk in acromegaly: a meta-analysis. *The Journal of clinical endocrinology and metabolism*. 2015;100(2):384-94.
- Maffezzoni F, Maddalo M, Frara S, et al. High-resolution-cone beam tomography analysis of bone microarchitecture in patients with acromegaly and radiological vertebral fractures. *Endocrine*. 2016;54(2):532-42.
- Malgo F, Hamdy NAT, Papapoulos SE, et al. Bone material strength index as measured by impact microindentation is low in patients with fractures irrespective of fracture