

Increased serum levels of the Wnt antagonist Dickkopf-1 (DKK1) and impaired trabecular bone mineral density using QCT scan in acromegalic patients

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OBJECTIVES

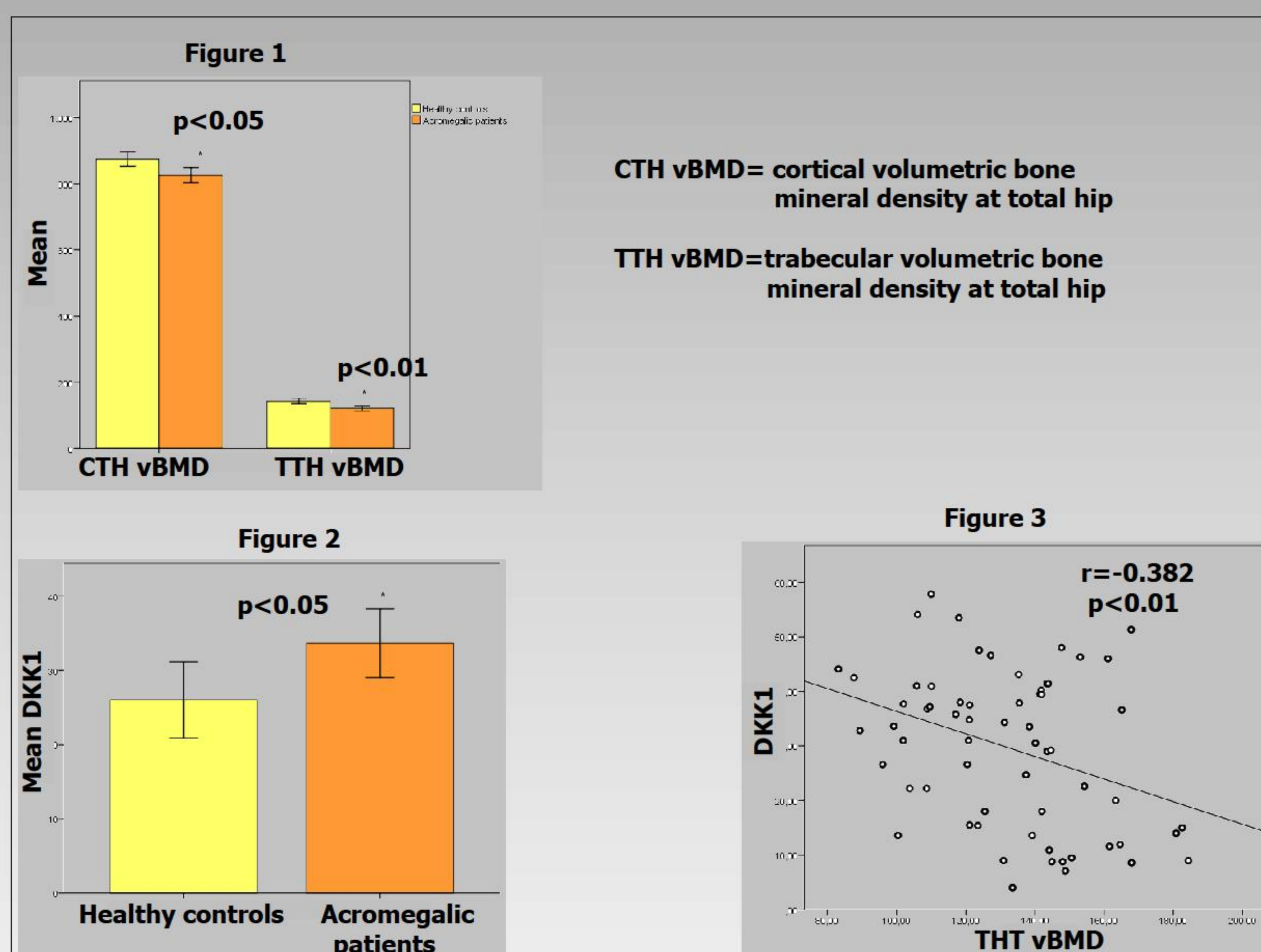
- To assess volumetric bone mineral density (vBMD) in patients with acromegaly.
- To compare vBMD in patients with acromegaly vs. age-, gender-, and BMI-matched controls.
- To correlate vBMD with the levels of Wnt antagonists, dickkopf-1(DKK1) and sclerostin (SOST).

METHODS

- Thirty-one acromegalic patients [17 (55%) men; 18 (58%) with active disease; mean age 48.2±7.5 years (range 28-65 years)] and thirty-two age-, gender- and BMI-matched controls.
- Volumetric QCT acquisitions of the proximal hip were performed. (Philips Brilliance CT 16-slice). All the QCT data were processed using QCT-pro Bone Investigational Toolkit Version 2.0 (BIT, Mindways).
- Serum concentrations of DKK1, SOST, β -crosslaps, procollagen type-1 amino-terminal propeptide (P1NP) and osteocalcin were also measured.

RESULTS

- Both cortical vBMD and trabecular vBMD at the level of total hip (CTH vBMD and TTH vBMD, respectively) were lower in acromegaly than controls (CTH vBMD, 776±199.4 vs. 937±346.4 mg/cm³; p<0.05 and TTH vBMD, 121.4±20.6 vs. 142.8±22.8 mg/cm³; p<0.01) (Figure 1).
- P1NP levels were lower (41.7±20.5 vs. 51±21.2 ng/ml, p<0.05), while DKK1 levels were higher (33.7±12.9 vs 26±14.8 pmol/l, p<0.05) (Figure 2) in acromegaly patients compared to controls.
- A negative correlation between DKK1 and TTH vBMD (r=-0.382, p<0.01) was observed (Figure 3). A positive correlation between P1NP, β -crosslaps, and SOST with CTH vBMD (r=0.34, r=0.27, r=0.26, respectively, p<0.05) was also observed.
- After multiple regression analysis, DKK1 and disease duration were independent, negative predictors of TTH vBMD (R²= 0.335, p<0.05), whereas female gender was an independent, positive predictor of CTH vBMD (R²= 0.156, p<0.05).



CONCLUSIONS

- Acromegaly patients exhibit low vBMD at the level of the total hip compared with healthy controls.
- The Wnt signaling antagonist DKK1 may contribute to the skeletal fragility described in acromegaly.

REFERENCES:

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