Sex Hormone Binding Globulin is associated with markers of Vertebral Fracture and Vertebral Fracture Risk

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AIM
To determine whether sex hormone binding globulin (SHBG) levels are associated with skeletal parameters constituting markers of vertebral fractures, including a) bone mineral density (BMD) b) trabecular bone score (TBS) and also c) prevalent vertebral fractures (VFs)

BACKGROUND
• High levels of SHBG have been associated to increased fracture risk.
• It remains unclear whether this association is independent of sex steroids (estradiol and testosterone) and bone strength markers (LS-BMD, LS-TBS).

METHODS
• We assessed X-Ray measurements of 6224 men and women participants of Rotterdam Study. VFs were scored with quantitative morphometric (QM) and algorithm based qualitative (ABQ) method.
• Serum SHBG and prevalent VFs were assessed at baseline whereas LS-BMD and LS-TBS were assessed 4 years later.
• To determine the associations linear and logistic regression models were performed:

LS-BMD (or LS-TBS) ~ Age+seks+height+BMI+ Bone treatment+Smoking+HRT+PA+Glucose+calcium+cholesterol+ phosphates +insulin+ estradiol+testosterone + SHBG (tertiles)

Model1: VFs~ Age+seks+height+BMI+ Sex + Bone treatment+smoking+HRT+PA+Glucose+calcium+cholesterol+ phosphates +insulin+ estradiol+testosterone +SHBG(tertiles)
Model2: Model1 + LS-TBS
Model3: Model2 + LS-BMD

CONCLUSION
This study suggests that SHBG concentrations affect vertebral fracture risk through BMD and not through micro-architecture parameters (LS-TBS). Since the effect of SHBG on BMD was independent of sex steroids, further studies are needed to explore the mechanisms through which SHBG affects BMD.