

"REFERENCE INTERVALS FOR MEASURED AND CALCULATED FREE 25-HYDROXYVITAMIN D IN NORMAL PREGNANCY."

([Hocher B. et al., J Steroid Biochem Mol Biol. 2018 Mar 19.](#))

The determination of free 25-hydroxyvitamin D (25(OH)D) as compared to the analysis of total 25-hydroxyvitamin D might reflect better the vitamin D status during pregnancy, since vitamin D-binding protein (DBP) concentrations increase throughout pregnancy and the vast majority of 25(OH)D is tightly bound to DBP thus strongly influencing total 25(OH)D. The concentration of the biologically active free 25(OH)D - on the other hand - is much less dependent on the DBP concentrations. The study was conducted in May-June 2016 in 368 Caucasian pregnant healthy women - residents of Northeastern Germany. Free 25(OH)D was either measured directly by commercial ELISA kit or assessed by calculation via total 25(OH)D, DBP, and albumin serum concentrations. Regardless of the detection method, free 25(OH)D lowers in the 3rd trimester comparing to the 1st trimester (by 12% and 21%, $p < 0.05$ and $p < 0.001$, for measured and calculated free 25(OH)D, respectively), whereas total 25(OH)D was not decreased in late pregnancy. DBP rises with gestational age. Total 25(OH)D was not correlated with serum calcium ($p = 0.251$), whereas free 25(OH)D was significantly ($p = 0.007$ for measured free 25(OH)D and $p < 0.001$ for calculated free 25(OH)D) positively correlated with calcium. All 25(OH)D isoforms were significantly negatively correlated with bone-specific alkaline phosphatase (BSAP), however the correlation strength was the lowest with total 25(OH)D ($\rho = -0.108$, $p = 0.038$), whereas both measured and calculated free 25(OH)D revealed better associations with BSAP ($\rho = -0.203$ and $\rho = -0.211$ for measured and calculated free 25(OH)D, respectively, $p < 0.001$ for both). We established pregnancy trimester-specific reference intervals for free measured and calculated 25(OH)D and DBP. Both measured and calculated free 25(OH)D showed better correlations with parameters of the endocrine vitamin D system (calcium and BSAP). Both ways of measuring free 25(OH)D in pregnant women are suitable as novel laboratory parameter for vitamin D status monitoring during human pregnancy and might replace in the future the routine total 25(OH)D assessment.