Andre A Valcour, Endocrinol Metab Synd 2014, 3:2
http://dx.doi.org/10.4172/2161-1017.S1.005

OMICS Group Conferences
Accelerating Scientific Discovery

2nd International Conference on
Endocrinology
October 20-22, 2014 DoubleTree by Hilton Hotel Chicago-North Shore, USA

Effects of age and serum 25OH Vitamin D on serum parathyroid hormone levels

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To determine the relationship between serum PTH and 25-OHD levels and age in a very large reference laboratory database, a detailed cross-sectional analysis of 312,962 paired serum PTH and 25-OHD levels measured from 7/2010 to 6/2011 was undertaken. Several studies have defined optimal serum 25-OHD levels based on serum PTH level reaching an asymptote. However, results differ widely ranging from 25-OHD levels of 12 to 44 ng/mL: many studies are constrained by small sample size. Median PTH levels and proportion of patients (PTH>65 pg/mL), from 63 successive 25-OHD frequency classes of 5,000 patients, provide smooth, exceptionally well-fitted curves (R^2=0.994 and R2=0.995, respectively) without discernible inflection points or asymptotes, but with a striking age dependencies. Serum 25-OHD was below the recent IOM sufficiency guidance of 20 ng/mL in 27% (85,000) of the subjects. More importantly, 40% and 51% of subjects (serum 25-OHD <20 and 10 ng/mL, respectively) had biochemical hyperparathyroidism (PTH>65 pg/mL). This analysis, despite inevitable inherent limitations, introduces several clinical implications. First, median 25-OHD dependent PTH levels revealed no threshold above which increasing 25-OHD fails to further suppress PTH. Second, the large number of subjects with 25-OHD deficiency and hyperparathyroidism reinforces the 3rd International Workshop on Asymptomatic Primary Hyperparathyroidism's recommendations to test for, and replete, vitamin D depletion before considering parathyroidectomy. Third, strong age dependency of the PTH~25-OHD relationship likely reflects the composite effects of age related decline in calcium absorption and renal function. Finally, this unselected large population database study could guide clinical management of patients based on an age dependent, PTH~25-OHD continuum.

Biography

Andre A Valcour is the director of the Esoteric Immunoassay, Allergy and Special Coagulation departments at LabCorp's Center for Esoteric Testing (CET) in Burlington, North Carolina. He also serves as national discipline director for these areas of testing and is responsible for method development and clinical correlation for these specialties. He also serves as technical director of the routine clinical laboratory in Burlington. He received his BS in chemistry from Clarkson University in Potsdam, New York and his PhD in biochemistry from the University of Vermont. He completed a postdoctoral fellowship in clinical chemistry at Hartford Hospital in Hartford Connecticut and is board certified in clinical chemistry by the American Board of Clinical Chemistry. He is a member of the National Academy for Clinical Biochemistry. He has published numerous research articles in analytical biochemistry and clinical enzymology.

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