Asymptomatic elevated PTH demonstrated to result from immunoassay interference

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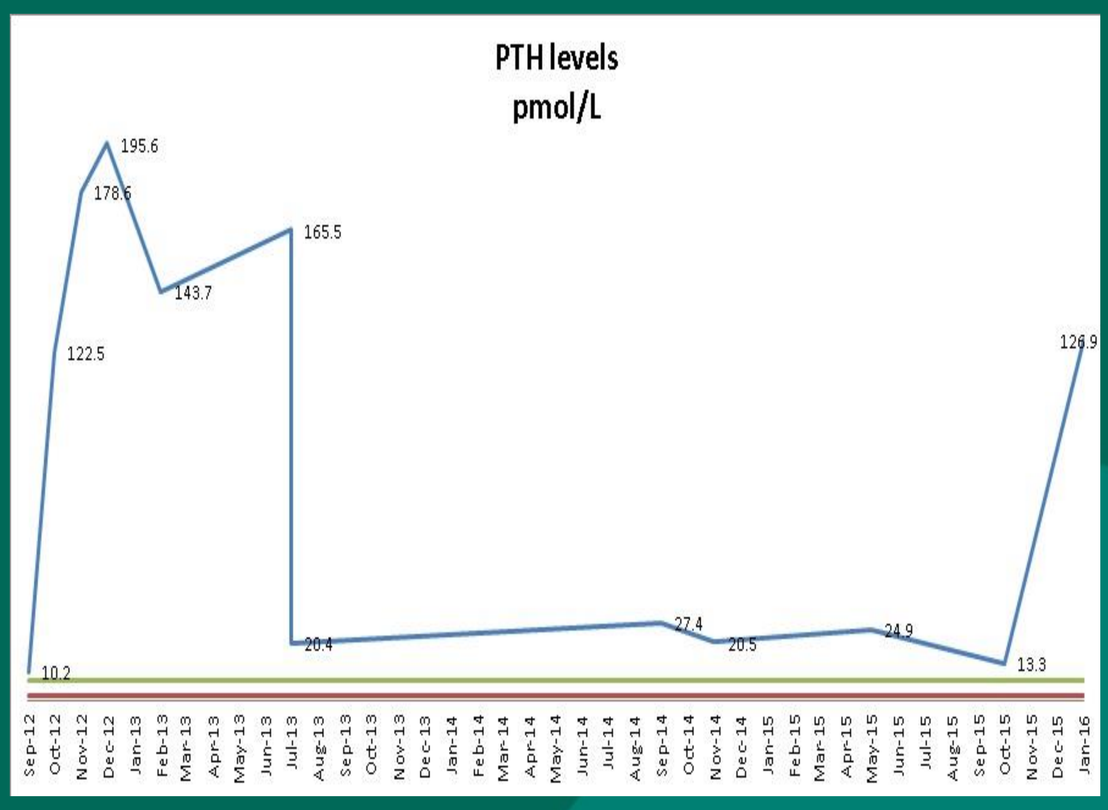
Introduction

Immunoassays are important tools in the diagnosis and management of disease; however they are not free from interference by cross-reacting substances. Discordant clinical evidence and laboratory results raised suspicion of interference in a patient with persistently raised parathyroid hormone.

Case Report

A 56-year-old Caucasian female previously diagnosed with hypothyroidism consistently demonstrated elevated PTH levels with normal renal function, calcium and vitamin D concentrations. There was no clinical evidence of hyperparathyroidism and imaging of thyroid and parathyroid showed no evidence of pathology. The highest level of PTH was 195.8pmol/L. Subsequently interference was suspected and nonlinearity on PEG dilution proved that a macro-PTH molecule distorted results on Roche and Abbott assays.

Laboratory Results



PTH 28.5 pmol/L – neat sample
PTH 47.0 pmol/L – 1:2 dilution
PTH 10.2 pmol/L – after PEG treatment
PTH 12.1 pmol/L – 1:2 dilution of PEG sample

Discussion

Immunoassays are susceptible to interference by a variety of exogenous and endogenous substances. Up to 6% of tests exhibit interference due to antireagent antibodies like Human anti-mouse antibody, Heterophile antibody, and Rheumatoid Factor which are frequently present in normal population. PTH measurement may be falsely altered by inactive forms and N-truncated fragments (7-84 PTH). The persistence of elevated levels after PEG dilution demonstrated that interference was present and unnecessary investigations and treatment of "hyperparathyroidism" were avoided.

Conclusion: Interference should be sought when there is lack of clinical correlation with immunoassay hormone levels.

References

Bolstad N, Warren DJ, Nustad K. Heterophilic antibody interference in immunometric assays. Best Pract Res Clin Endocrinol Metab. 2013;27(5):647–661
Sturgeon CM, Viljoen A. Analytical error and interference in immunoassay: minimizing risk. Ann Clin Biochem 2011; 48: 418–432
Schiettecatte J, Anckaert E, Smitz J. Interferences in Immunoassays. (2012)., Dr. Norman H. L. Chiu (Ed.).

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BES2016 4--CC
Clinical biochemistry
Jayadave Shakher
DOI: 10.3252/pso.eu.BES2016.2016
Poster presented at: SfE BES 2016 7-9 November BRIGHTON
PosterSessionOnline.com