

Hypercalcemia and elevated concentration of vitamin D: A case report too easy to be true

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1 History

* 61 yr old male patient investigated for asthenia, nausea, anorexia. He has lost 8 kg during the last 3 wk.

Intense thirst and dehydration.

* Hypercalcemia 2.9 mmol/L; ref [2.2;2.6], kidney failure

Low PTH (12 pg/mL; ref [12;88]. Dxl, Beckman-Coulter)

Elevated 25OH vitamin D (25OHD) above the analytical range of the analyser (>150 ng/mL; toxicity > 100. Liaison XL, Diasorin)

* The patient denied any oral vitamin D intake...

2 Analytical investigation

* Serum dilution failed to show linearity:
Undiluted >150, dilution 1:2 > 150, 1:5 40, 1:10 40 ng/mL

* Serum cleaning of heterophilic antibodies failed to recover linearity (heterophilic blocking tubes, Scantibodies)

* This suggest the existence of an analytical interference in the 25OHD immunoassay

3 Subsequent investigation

* Monoclonal peak of immunoglobulin G (29.8; ref [6.7;12.8] g/L) with elevated free lambda chains (734; ref [8.3;27.0] mg/L) attributed to a myeloma.

* Serum cleaning of endogenous antibodies normalized 25OHD: 18 ng/mL (NabTM column, Thermo Scientific)

* Alternate assays in untreated serum were consistent: 16.0 ng/mL (25OHD RIA, Diasorin), 10.3 ng/mL (Cobas, Roche), 22.0 ng/mL (iSYS, IDS), 14.0 ng/mL (LC-MSMS).

Suspect an erroneous elevated immunoassay result

Arguably the trikiest part

Action: try dilutions
Result: failed linearity
Conclusion: interference probable

Inquiry: known cross-reaction?

Action: try alternate assay
Result: different concentration
Conclusion: interference probable

Action: try clearing sample (HBT tubes, NabTM columns, modify diet...)
Result: new concentration consistent with alternate assay
Conclusion: problem solved!

Inquiry: risk factors for interference?
Autoimmune disease, myeloma, treatment with immunoglobulins, work with rodents, biotin-rich diet...