EVALUATION OF IMMUNOGLOBULIN G COMPLEXED FORM OF THYROID STIMULATING HORMONE [MACRO TSH] AS INTERFERENCE IN TSH ASSAY

Abstract

Background: Macrocomplexes can cause elevation of serum hormone concentrations which may lead to diagnostic confusion. It is well recognized for hormones like prolactin for which polyethylene glycol (PEG) precipitation is commonly used as screening test. This phenomenon and screening method is less familiar with respect to thyroid-stimulating hormone (TSH). Isolated elevation of TSH in clinically euthyroid patient can be caused by a macrocomplex formed between TSH and Ig (macro-TSH), confounding the interpretation of thyroid function test results.

Method: Samples sent to the laboratory for routine analysis of thyroid function and found to have a TSH >10mU/L and Free T4 within normal limits [0.8 - 2.7ng/dl] were subjected for evaluation of macro-TSH in the Roche Elecsys assay, using PEG precipitation with confirmation by protein G addition test.

Results: A cut-off <25% of recovery was determined for identifying the samples which require further investigation for the presence of macro-TSH. Of 200 samples tested, 9 were found to have a cut-off <25% recovery with PEG precipitation test. These samples were further subjected to protein G addition test for confirming the presence of TSH and Ig complexed macroTSH.

Conclusion: Macro-TSH is an underrecognized laboratory interference. It is important to identify a macro-thyroid stimulating hormone (TSH) in a patient with an unexplained elevated TSH concentration, which would prevent further unnecessary investigations and management. Laboratories should be aware of this cause of assay interference.

Keywords: Thyroid hormones, macro TSH, PEG, analytes, immunoassay, laboratory interference, thyroid function test.