

## Preanalytical Relates in the Determination of the Parathyroid Hormone

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### ABOUT THE STUDY

Mechanical immunoassays used to assess parathyroid function are susceptible to various kinds of disturbance, which can have an impact on clinical practice. This paper gives a comprehensive summary of the six major kinds of interference known to influence Parathyroid Hormone (PTH) measurement: Heterophilic antibodies, biotin, PTH fragments, Oxidized PTH (oxPTH), phosphorylated PTH, and some preanalytical factors. Because the prevalence of some of these diseases has been found to be as high as 11.7%, and testing for parathyroid function is essential, the scope of the issue could be enormous. When clinical or biochemical differences emerge, potential influence in parathyroid function testing should always be feared. Additional laboratory tests, such as technique comparison, serial dilution, blocking reagent studies, affinity adsorption, and polyethylene glycol precipitation, are usually used to identify them [1]. Furthermore, with the advancement of mass spectrometry, some of these problems can be alleviated. This study also looked at the clinical consequences of parathyroid interference on immunoassays, such as misdiagnosis, improper parathyroidectomy, and a delay in getting appropriate treatment. To prevent such situations, the clinician and laboratory should keep open lines of contact. In the parathyroid glands, a 115-amino acid precursor (prepro-PTH) is produced, which is cleaved to pro-PTH and then to the functional 84-amino acid protein. (1-84 PTH) [2]. It is metabolized after release into carboxyl-terminal, amino-terminal, and mid-molecule pieces. PTH, as an essential regulator of calcium and phosphate homeostasis, is critical in diagnosing hyperparathyroidism, hypoparathyroidism, parathyroid carcinoma, parathyroidectomy, and chronic kidney disease-mineral and bone diseases. PTH is also linked to all-cause mortality in a CKD population, including atherosclerotic events, sudden heart failure, Chronic Kidney Disease (CKD) development, and death from any cause. As a result, precise measurement of PTH levels in these individuals is critical [3].

Immunoassays are currently the most commonly used tools for measuring parathyroid function due to their complete mechanization, quick response time, and high specificity and sensitivity. Immunoassays, on the other hand, are susceptible to various kinds of interference, which can lead to incorrect

therapeutic practices [4]. It has proven challenging to identify these interferences because they may be unique to a person and change over time, resulting in false-positive or false-negative findings. Because interference is more likely to occur in patients, having a good understanding of the assay's clinical background is beneficial. Who recently obtain immunization, transfusion, monoclonal treatment, autoimmune illness. Errors in immunoassay findings from commonly used systems for PTH detection have recently become more prevalent. We outline six of the most common interferences found in clinical PTH assays: PTH fragments, heterophilic antibodies, biotin, oxidized PTH, phosphorylated PTH, and some preanalytical variables are all included.

In immunoassays, PTH particles are the most common source of contamination. The first-generation test, based on a competitive Radioimmunoassay (RIA), was created in 1963 [5]. Due to a unique antibody recognition site and the use of polyclonal antibodies, it was subsequently discovered that most anti-PTH antibodies are directed against the carboxyl-terminus of the peptide, rendering it non-specific. A substantial percentage of PTH, however, is cleaved to carboxy-terminal breakdown products, which accumulate in patients. This analysis will concentrate on the six major interferences known to influence PTH measurement. We can infer from the two typical immunoassay principles diagrams that other rare interferences, such as anti-streptavidin antibodies, anti-ruthenium antibodies, and PTH-related proteins, may occur. Because of their uniqueness and variability, both of these interferences proved challenging to detect.

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