

CALCITONIN

INTRODUCTION

Calcitonin or Thyrocalcitonin is a polypeptide hormone secreted by parafollicular C cells of thyroid. It acts directly on osteoclasts to decrease bone resorbing activity and decrease serum calcium levels

NORMAL RANGE

REFERENCE GROUP	REFERENCE RANGE IN pg/mL
Males	< 8.4
Females	< 5.0

CLINICAL USE

- Diagnose and monitor patients with Medullary thyroid carcinoma (MTC) which occurs as a sporadic disease or as a part of the syndromes of MEN-2A, MEN -2B & Familial MTC. Calcitonin is primarily used for diagnosing sporadic MTC / Index case in Familial MTC / monitoring MTC
- Routine screening of Nodular thyroid disease to detect unsuspected sporadic MTC
- For provocative testing in MTC, Calcitonin stimulation test is recommended to increase sensitivity of detection
- To monitor effectiveness of surgery by serial measurement of basal and stimulated calcitonin concentrations

INTERPRETATION

Increased Levels

- Medullary carcinoma thyroid
- C-cell hyperplasia
- Non thyroidal cancers like Oat cell carcinoma / Small cell carcinoma, Intestinal / Bronchial / Gastric Carcinoids, Melanoma, Pheochromocytoma, Pancreatic carcinoma & Breast carcinoma
- Hypergastrinemia & other Gastrointestinal disorders
- Acute & Chronic Renal failure
- Hypercalcemia of any etiology stimulating Calcitonin production
- Pulmonary disease
- Pernicious anemia
- Zollinger – Ellison syndrome

HIGH RISK FACTORS FOR MTC

- Familial MTC – accounts for 5% of Thyroid cancer. The 3 familial forms are MEN2A, MEN2B & MTC without features of MEN. MTC is more aggressive in MEN2B as compared to other two forms. Familial MTC is much more aggressive than sporadic MTC

LABORATORY DIAGNOSIS

- Fine needle aspiration cytology (FNAC) of Thyroid nodule
- Biopsy
- Ultrasound
- Calcitonin levels
- RET mutation detection – recommended for familial MTC

LIMITATIONS

- Basal Calcitonin levels may be normal in approximately one third cases of Medullary thyroid carcinoma
- Calcitonin levels have a circadian pattern peaking after lunch time
- Very high levels of Calcitonin are almost always associated with MTC but rarely may be seen in cases of Renal failure or ectopic production of Calcitonin
- This test is not useful for evaluating calcium metabolic diseases
- Procalcitonin and other calcitonin precursors may also be detected in MTC
- Falsely elevated values may be seen in serum of patients who have developed Human anti-mouse antibodies or heterophilic antibodies