CALCIUM AND PARATHYROID HORMONE REGULATION

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The parathyroid glands play a central role in the regulation of serum calcium levels through the production of the active 84-amino-acid peptide, parathyroid hormone (PTH). PTH is secreted in response to low serum calcium or high serum magnesium levels. It is initially cleaved in the liver, yielding an inactive C-terminal that is cleared by the kidneys. The N-terminal fragment is responsible for the biological activity of PTH on peripheral tissues. The active circulating molecule has a half-life of approximately 3–5 minutes in patients with normal renal function. PTH acts directly on the kidneys, bone and the gastro - intestinal tract to activate intracellular second messengers, including cyclic AMP and calcium. In the kidneys , PTH increases serum calcium levels by increasing resorption of calcium from the renal tubules and increasing the hydrox - ylation of 25-hydroxyvitamin D to the biologically active 1,25-dihydroxyvitamin D. Active vitamin D increases both the resorption of phosphorus in the kidneys and the absorption of calcium from the gastrointestinal tract. In bone, PTH acts on

2% 2% Intrathyroidal 3% 56% Related to lower pole of thyroid 28% In thyrothymic tract 9% Related to upper pole of thyroid 11% Around intersection 77% of ITA and RLN 1% Intrathyroidal 10% parathyroid glands. ITA, inferior thyroid artery; RLN, recurrent laryngeal nerve.

increasing the amount of calcium in the extracellular space (Figure 56.2). Calcitonin, which is synthesised by the parafollicular C cells of the thyroid gland, acts as the physiological antagonist to PTH. Calcitonin decreases serum calcium by decreasing bone turnover . CALCIUM AND PARATHYROID HORMONE REGULATION

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