Parathyroid hormone

Parathyroid hormone (PTH), parathormone or parathyrin, is secreted by the chief cells of the parathyroid glands as a polypeptide containing 84 amino acids, yet effective hormone-receptor interaction requires solely the 34-N-terminal amino acids. While PTH acts to increase the concentration of ionic calcium (Ca2+) in the blood, calcitonin, a hormone produced by the parafollicular cells (C cells) of the thyroid gland, acts to decrease ionic calcium concentration. PTH essentially acts to increase the concentration of calcium in the blood by acting upon the parathyroid hormone 1 receptor, which is present at high levels in bone and kidney, and the parathyroid hormone 2 receptor, which is present at high levels in the central nervous system, pancreas, testis, and placenta.PTH half-life is approximately 4 minutes.It has a molecular mass of approximately 9500 Da.

Few studies have examined the relationship between diet and Modic changes. Johansen et al. studied the relationship between vitamin D and MC and surprisingly found that MC were more common in individuals with normal levels of vitamin D than in those with low levels. However, the mechanisms underlying the development of MC remain unclear at present. Findings suggest that the link between vitamin D and MC is perhaps related to inflammation, though further confirmatory studies are needed [1)].

Individuals with MC are expected to have low levels of vitamin D because of an increased susceptibility to inflammation and/or because microfractures occur in the vertebrae because of increased levels of parathyroid hormone [2) 3)].

Analogs

Parathyroid hormone analog

1)
Johansen JV, Manniche C, Kjaer P.: Vitamin D levels appear to be normal in Danish patients attending secondary care for low back pain and a weak positive correlation between serum level Vitamin D and Modic changes was demonstrated: a cross-sectional cohort study of consecutive patients with non-specific low back pain. BMC Musculoskelet Disord, 2013, 14: 78.
2)
D'Ambrosio D, Cippitelli M, Cocciolo MG, et al. : Inhibition of IL-12 production by 1,25-dihydroxyvitamin D3. Involvement of NF-kappaB downregulation in transcriptional repression of the p40 gene. J Clin Invest, 1998, 101: 252–262.
3)
Mosekilde L.: Primary hyperparathyroidism and the skeleton. Clin Endocrinol (Oxf), 2008, 69: 1–19.