



## **Calcium, diabetes, and hormones**

### **Diabetes**

One of the most important Calcium containing hormone is Insulin. Insulin is always secreted to control sugar quantity in the blood stream by adequately dissolving sugars.

When insulin secretion is abnormal, diabetes results. Insulin is secreted from B (beta) cells in the islet of Langerhans in the pancreas. Ionic or plasma Calcium plays an important role in insulin secretion in these cells. If Calcium in the exterior fluid surrounding these cells is removed or if the calcium channels are blocked, insulin secretion is also blocked. Insulin secretion cannot occur without Calcium.

Calcium balance in and out of these cells is directly related to the function of insulin control. Active Vitamin D, a hormone, is also critical in insulin secretion. And while dissolving blood sugar to lower its level by insulin injection is an effective and lifesaving remedy, one must also be aware of this critical plasma Calcium and Vitamin D connection as a potential for long term rehabilitation.

Proper intake of Calcium and Vitamin D will improve insulin secretion and in the long-term assist in lowering blood sugar levels. This could be critical in light of recent studies on memory loss and Blood sugar levels.

### **Relationship between female hormones and Calcium control hormones (PTH)**

There are hormones that relate to increasing, dividing and activating cell groups within the components of bone structure. Parathyroid hormones control plasma or ionic calcium:

Definition: Parathyroid hormone or parathormone: A hormone secreted by the parathyroid glands that regulates the metabolism of calcium and phosphate in the body. It has been purified extensively and appears to be a protein containing 84 amino acid residues, a sequence of which about 33 to 35 are necessary for biological activity.

Parathyroid hormone acts to raise the ionic calcium concentration, that is, the concentration of calcium ions in the spaces between the cells of the body and in the blood plasma.

PTH promotes the absorption of calcium by the intestine, mobilizes calcium salts from the bones, and increases the tendency of the kidney to recover calcium from the urine. This hormone also enhances both the excretion of phosphate by the kidneys and its uptake by the cells. This removes phosphate, which tends to form a relatively insoluble salt with calcium, from the extracellular spaces, allowing more calcium to remain in solution.

Calcium is intimately involved not only in the formation of bone, but also in the functioning of the nervous system; thus hypoparathyroidism, the disease associated with a deficiency in parathyroid



hormone secretion, is characterized by muscle spasms leading eventually to generalized convulsions and various psychiatric symptoms. This condition is sometimes successfully treated by the administration of the hormone.

Hyperparathyroidism: the result of over secretion of the hormone, often leads to the resorption of bone and can only be treated up to now by the surgical removal of all of the parathyroid glands, which can be found in unusual locations (usually near the Thyroid, hence the name).

It is possible that Nano-Cal can remedy this over secretion by flooding the system with ionic Calcium.

Active Vitamin D: A hormone which promotes bone formation and calcium absorption. Vitamin D is a name given to two fat-soluble compounds: calciferol (vitamin D2) and cholecalciferol (vitamin D3). They are now known to be hormones but continue to be grouped with vitamins because of historical misclassification.

Vitamin D3 plays an essential role in the metabolism of calcium and phosphorus in the body and prevents rickets in children. A plentiful supply of 7dehydrocholesterol, the precursor of vitamin D3, exists in human skin and needs only to be activated by a moderate amount of ultraviolet light (less than a half hour of sunlight) to become fully potent.

Symptoms of vitamin D deficiency in children include bowlegs, knock knees, and more severe (often-crippling) deformations of the bones. In adults' deficiency results in osteomalacia, characterized by a softening of the bones.

Rickets is usually caused by a lack of exposure to sunlight rather than a dietary deficiency, although dietary deficiencies can result from malabsorption in the small intestine caused by conditions such as sprue or colitis. Rickets can be prevented and its course halted by the intake of vitamin D2 (found in irradiated yeast and used in some commercial preparations of the vitamin) or vitamin D3 (found in fish liver oils and in fortified milk).

Excessive vitamin D consumption can result in toxicity. Symptoms include nausea, loss of appetite, kidney damage, and deposits of insoluble calcium salts in certain tissues.

The recommended daily dietary allowance for cholecalciferol is 5 to 10 micrograms (400 to 1000 IU) depending upon age and the availability of sunlight. Fortified cow's milk supplies 400 IU per quart (422 IU per liter).

Calcitonin: A polypeptide hormone that participates in the regulation of calcium levels by inhibiting loss of calcium from bone to the blood. Female hormone secretion suppresses parathyroid hormone secretion and promotes Vitamin D and Calcitonin secretions.

One of the reasons why an overwhelming number of women, during menopause, have Osteoporosis is due to the synergistic effect between Parathyroid Hormones and female hormones. The most basic factor in osteoporosis is an insufficient supply of ionic or plasma calcium.