



VITAMIN NEWS



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VITAMINS, CALCIUM METABOLISM and ACIDOSIS

The first commercially important vitamin was Vitamin D. Its physiological function is to maintain a normal concentration in the blood of diffusible (serum) calcium. The non-diffusible calcium is probably present in the blood as a component of the blood cells and is obtained from the non-diffusible reserve, which reserve is also the source of supply for all the calcium requirements of the body.

In case of a dietary deficiency of calcium or Vitamin D, the serum calcium drops to a low level, the non-diffusible (cell calcium) tending to remain normal.

When Vitamin D is supplied without the supplementary dietary calcium the blood content of non-diffusible calcium will be increased at the expense of the bone reserves.

If there is a deficiency of phosphates in the diet, together with a deficiency of Vitamin D, a condition of calcium starvation can be evident, even if there may be ample calcium in the diet. Harris (Lancet, May 14, 1933, page 1031) says that more cases of rickets are due to phosphate deficiency than are due to calcium deficiency.

It is well known that the cancellous structures of bone are built up in great detail from the administration of phosphorus. An opposite condition occurs in the aged, the bones become weak and brittle because of the loss of calcium, an end result of phosphate deficiency. Vitamin D in such a case will only aggravate the situation - rob the bone reserves to raise the blood calcium.

There is also a tendency in the adult for the calcium phosphate to become converted in the body into the carbonate - the pathological form - which is insoluble, and can cause considerable trouble. The administration of the phosphoric radical in some form will convert this morbid form of calcium into the useful phosphate, as well as improve the assimilation of other calcium. The lime in drinking water, for instance, being the carbonate, can be of no dietary use unless the phosphoric radical is added, or other alkali phosphates are present in sufficient quantity to afford the opportunity of a chemical interchange. These alkali phosphates are found only in any abundance in wheat bran, which is a food many of us fail to get.

"Bone is a dynamic, not static, structure. New bone is not formed if either phosphorus (in combination) or calcium is not supplied in sufficient amounts by the blood." (Harris).

All Vitamin D can do is to increase the retentivity of the blood serum for calcium. If the diet is rich in this element, the direction of flow of calcium will be from the alimentary organs to the bones. If the diet is deficient in calcium phosphate, the bones will lose this material to the blood.

In the case of growing children (and in pregnancy), there is a great demand upon the non-diffusible calcium reserve. When the serum calcium percentage drops below a certain threshold point, the kidney refuses to excrete any more calcium compounds. Instead, it replaces all calcium in combination, with some other alkali base, ammonium if none other is available. The synthesis of this ammonium is one of the least appreciated of kidney functions. (See Journal A.M.A. July 15, 1933.)

We believe that vitamins have an important bearing on this synthesis of ammonium to protect the alkali reserves, and that the cause of acidosis is always kidney failure, and that such failure is a consequence of vitamin deficiency.

Our reason for such a belief is the remarkable and rapid improvement that occurs when "Catalyn" is given to persons having the acidosis complex which usually includes some kidney complications.

Low blood calcium results in nervousness, insomnia, and irritability in the adult. In the child, it causes a quarrelsome disposition, restlessness at night and low-resistance.

We know that phosphorus and calcium are all important constituents of nerve tissues. The results of starving the nervous system of these elements are a hundred times as observable as the results of bone starvation - rickets. And do not forget that unless the phosphoric radical and calcium are amply present in the diet, Vitamin D may aggravate the situation by attracting into the blood these mineral elements it should be carrying to the tissues, and that the phosphoric radical is more likely to be needed than calcium, and that the ideal arrangement is to see that all three are present.

Edited by Royal Lee