

MINERAL TRANSPORTERS

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I think a few of you have already heard of the concepts of active mineral transports in directed therapy. I will give you a tour of horizons of what active mineral transport is and what it can do and how it is to be explained.

Late in the 1950s it was discovered that cells of the female breasts becoming malignant are going to lose magnesium so we thought why not conceive of an extra-active transport principle to take magnesium into these cells with the help of phenylalanine and paraminobenzoic acid.

At the same time, Hans Selye's book on the prevention of myocardial necrosis with the help of potassium and magnesium chloride was published and so we developed, in fulfilling the requirements of more active transport of potassium and magnesium into the cell, the potassium-magnesium aspartate in 1957-1958. This became quite successful world-wide as a medicament for the protection of myocardial necrosis, enhancement of liver functions and the detoxification of digitalis. Since this has been so successful, we followed this concept of active mineral transport and we changed as well the mineral which had to be transported as also the molecules which are suitable to transport the mineral into a cell by means of artificially created active transport. So the most important transporters we have today are aspartic acid, 2-aminoethylphosphoric acid and orotic acid.

2-aminoethylphosphoric acid (AEP) is a substance which plays a role as a component in the cell membrane and at the same time has the property to form a complex with minerals.

You may replace the calcium by magnesium, potassium, iron or whatever. This substance goes into the outer layer of cell membrane is decomposed there, incorporated into the cell membrane and releases the ion upon metabolization.

The second substance, the aspartates, especially the L-aspartate, goes to the inner layer of the outer cell membrane and there, upon metabolization releases the mineral to become the ion.

The third substance which interests us enormously is orotic acid which forms a high complex salt with any mineral and which has no metabolic affinity to the outer cell membrane but penetrates the outer cell membrane even in the form of a complex salt and is only metabolized at the site of the membranes of the mitochondria and of the structures found in the cell plasma. Only here the mineral will be released to the form of an ion.

So we have three different kinds of transporters: The AEPs (outer layer of the outer cell membrane), the aspartates (inner layer of the outer cell membrane) and the orotates (cell plasma organelles).

All three substances are officially on the market in Germany and they play an important role in cardiology and hepatology for the aspartates. In the prevention and the treatment of multiple sclerosis, for the AEP, calcium potassium magnesium AEP is officially declared in Germany as the only active substance in the treatment of multiple sclerosis. The myelin is a multilayer of cell membrane and AEP goes there, fits as a membrane component in the damaged membrane in the case of multiple sclerosis, releases the calcium at the same time which shields against aggression by antibodies.

The orotates are officially on the market for the treatment of numerous diseases, especially decalcification and immune aggression toward the cell.

Keep this in mind: different transporters go to different structures inside the cell. We will direct ourselves to calcium orotate.

Calcium orotate really performs clinical effects in various diseases connected with decalcification and injury of bones which can

rapidly be improved by means of the application of calcium orotate by using this new concept of active mineral transport since we know, especially in studies run in Zurich, that all formation of bone, more or less, is controlled by cell membrane and that the microgranules of apatite have to be formed inside the osteoblast and then released through the cell membrane again.

A patient's leg was sliced off with all the attendant injuries of vessels. It was almost impossible to heal him by conventional means. He received calcium orotate for two years and he is now able to walk around. He telephoned me recently and said he is in excellent shape. This is one of the accidents and injuries which really needs calcium orotate to achieve the best results which are obtained today in my opinion.

Bone fractures have been treated unsuccessfully for several months and years without formation of callus or healing. The bone fractures were due, in one case, to an immune arteriolitis. Upon application of calcium orotate, within six weeks the patient returned to normal functions and had no more complaints.

Especially in Europe more than in this country, decalcification has to do with the higher carbohydrate intake. In Germany we have a tremendous amount of, more or less, severe damages in the dorsal spine. A 28-year-old patient suffered with juvenile decalcification and severe osteochondrosis. There was no help for this patient, not by hormones or conventional calcium. However, upon treatment with calcium orotate he became normal in every respect within a few weeks and is still without any complaints.

Now here I have to stress a little bit the aspects of the transport by the orotates. The orotic molecule is mostly taken up by mesenchymal tissue and by bradytrophic tissue, especially by cartilage tissue and also by the vessel walls, by the blood-brain barrier and by the matrix of the bone. It is much less taken up by epithelial tissue such as liver epithelium glands, and so on, or mucosa, in contrast to the AEP, for instance. We learned, during the months and years that the improvement which we observed in dorsal spine complaints upon the application of calcium orotate, obviously had not so much to do with an improvement of the recalcification, or the improvement of the density of the bone tissue, but with the protection given to the tissue and cartilage

surface by means of active calcium transport into cartilage tissue with the help of orotic carrying molecule.

The orotic acid plays a very important role to so-called pentose pathway metabolism which accounts for the metabolism in cartilage tissue and especially for all organs which account for aging. There, the ribose coupling needs orotic acid and therefore obviously the orotic carrying molecule has a high affinity to this kind of tissue, like cartilage which, so far, we were unable to influence and which experienced even more damage under the influence of cortisone. Therefore, calcium orotate seems to me to be one of the most important substances to prevent cortisone side effects in, eg, rheumatoid arthritis. This is very important.

I could speak much longer on this problem. However I want you to have a certain impression. During the following years in which you will stay healthy with the help of orotates, you will be able to learn more and more about this. A 4-year-old girl, unsuccessfully treated so far with every imaginable medication, was entirely relieved with calcium orotate, because the calcium orotate goes into this connective tissue which develops in the frame of this disease, as well as in Pott's disease, as in Schlatzer disease and in Recklinghausen's disease.

By the way, I have quite a few patients who after the intake of contraceptive pills developed cartilage damage. The application of calcium orotate allows the continuation of the intake of these contraceptives.

A patient with a severe osteochondrosis was almost entirely immobilized. After six weeks of treatment, there were no more complaints. Astonishingly enough, there is no parallel between the lack of increasing density of bone tissue and improvement, which again points into the direction that the origin of pain in spinal syndrome has to do with cartilage behavior and less so with osteoporosis as such. A 64-year-old lady with severe decalcification and in severe pain had a disc slipped off a vertebra. She was treated unsuccessfully for years and is now without any complaints for two years. Although without any radiological improvements she is fine. In the case of severe osteochondrosis in an 18-year-old patient, she was almost immobilized two years ago. She has now absolutely no complaints and is mobile, despite

the fact that there is no change in roentgenologic finding.

What we see in Europe in dorsal spine deformation is alarming. I do not know if you have a parallel in the United States. From the literature, I learned that decalcification problems in Europe play a much more important role than in this country because in the United States the protein intake is, on the average, higher.

We learned recently that Bechterew disease is an autoimmune disease related to rheumatoid form and astonishingly enough as well as the intravenous application of calcium AEP as the application of calcium orotate gives very important relief in these patients. We have the feeling that the application of the orotates blocks the immune processes which lead to an abnormal arid ectopic calcification in these patients. They become partly remobilized and we have patients who gained about 20 degrees in upright position. Especially, there is no more pain. I have quite a series of Bechterew disease patients and they were always very much helped by this kind of treatment, where previously all other imaginable treatment failed. One patient had this disease for about 13 years and after 11 years of ailing we started the treatment with calcium AEP intravenously and calcium orotate there were no more complaints, she resumed normal housekeeping and gained about 20 degrees of an upright position. Another patient was an 82-year-old lady with excellent activity. Only in upright position she had unbeatable pain and when lying down had no pain at all. This is a typical symptom for chondrosis. Upon impact on the cartilage the pain developed. After the treatment with calcium orotate (3 gm/day) she had no more pain at all. She is going around in a Fiat sports car at 82 years of age.

Arthrosis of the hip shows good results with the treatment of calcium orotate. Of course, you cannot replace damage and lesion. However, we have the feeling that once the first signs of osteochondrosis develop, the long-time treatment with calcium orotate helps a lot and at least stretches out the time until eventually the arthrosis will have developed to become a surgical problem. The protection of the cartilage layer really is the mechanism which accounts for the prevention of osteochondrosis and of arthrosis.

We have quite a series of patients with severe osteoporosis with arthrosis on both sides who underwent operations and were previously, for about six months, treated with calcium AEP and calcium orotate. Surgeons reported a very important hardening of the spongiosal structure of the bone and all over it seems that the results, especially upon the implantation of the metal, seem to be much better after such a pretreatment than without it.

In Houston, Texas, four years ago at the Cancer Congress, I presented a series of patients who had developed metastatic disease, mostly breast cancers with bone metastases. We started about five years ago. This was the first clinical step with calcium orotate to try to recalcify these metastases. We found that calcium orotate has no side effects at all. It is more successful than sodium fluoride in the calcification of bone metastases and we had excellent and reliable success in about 40% of all metastatic disease in the bone system. One patient had very severe lesions in the left hip. After treatment with calcium orotate for about eight weeks this patient was free from any complaints, the lesions were mostly recalcified. This patient, too, went around in a Fiat sports car without having any complaints.

Another patient came with 200 parts per million of serum calcium pretreatment with important doses of conventional calcium which resulted in hypercalcemia, a dangerous situation concerning the heart rate and heart metabolism, with thousands of metastases and practically in a terminal situation. After about four months of treatment with calcium orotate there was almost entire recalcification. The results speak for themselves: no more complaints.

This is calcium orotate, it's effect on recalcification of bone metastases on cartilage tissue and also on osteoporosis. Without any doubt, clinically, it is obvious that there is no calcium compound known which affects cartilage tissue and which prevents damage on pentose pathway tissue such as cartilage. I feel this is quite a bit of progress in preserving our health and especially in preventing aging of tissue.