THE COLAMINE PHOSPHATE SALTS AS MEMBRANE INTEGRITY FACTOR

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Hannover, West Germany, 1989.

In the year of 1941, the eminent biochemist ERWIN CHARGAFF identified a special component of cell membranes, the so-called colamine phosphate or chemically named 2-aminoethanol phosphate.

The significance of this discovery was ignored and not understood over a long period of time. Only the couple FERRARI and a few coworkers investigated colamine phosphate for biological reasons. I focused on developing the so-called electrolyte transporters the same way as LABORIT around 1956. Simultaneously with Laborit, but independent of him, I could apply in 1958 for a series of very successful patents in this field, especially concerning aspartates, para-aminobenzoates, phenylalaninates and also nicotinylaspartates. A few interested groups became increasingly aware of components in cellular metabolism and of the membrane structure as potential electrolyte transporters.

During the spring of 1961 the chemist and pharmaceutical industrialist BERNAUER of Zurich, Switzerland, visited me. He asked me whether the colamine phosphates could be used as carriers of iron into the cells. He brought along extensive literature, especially Ferrari's. My opinion at that time was that iron colamine salts would be too risky - even as of today I am of this opinion. However, calcium, magnesium, potassium and lithium salts of this molecule could be exceedingly interesting. During the early summer of 1961, I asked DR. FRANZ KÖHLER, SR. of Alsbach, Bergstrasse, to prepare above named salts of colamine phosphate for me.

From then on, at first haltingly, then a noticeable victory parade of this class of compounded substances began. This development in medicine was, as of that date, quite singular.

The theoretical postulate was to find a calcium carrying molecule which would be preferably a calcium salt. This would shield the molecule from auto aggression, immunological and possibly toxic and viral attack. The concept turned out to be very substantiated. It still holds true today, especially after the publication of a very meaningful work by MÖNNINGHOFF in 1974. The author proved that calcium and colamine phosphates cause a remarkable sealing effect within the cell membrane. Mönninghoff demonstrated in this manner that endothelial cell membranes may be completely sealed off against penetration of peroxidase granules. The studies were done under an electron microscope. Undesired aggressive factors in nutritive substances were permitted to pass the cell membranes without being able to enter.

In 1964 we began the clinical use of Calcium EAP and Phosetamine.* Since 1967, Calcium EAP was officially declared on the basis of Federal German laws to be permitted in the therapy for multiple sclerosis. After 1968, following a paper by DUDZIAK from the MS clinic in Hachen, under the then director SCHORRF, in which the author reported positive results of the therapy on the cerebral symptoms of MS, Calcium EAP was limited to this indication in the official declaration. This, however, did not have any effect on clinical use, since it must be mentioned that the observations in Hachen were limited to from 4 to the maximum of 8 weeks. According to our files, we have observed patients up to 23 years. Today we know that colamine phosphate salts are not only "shields" or "sealants" of cell membranes. Moreover, colamine phosphate has a specific action of its own, namely to maintain or repair neurotransmission, absolutely necessary for the electrobiological connection. The binding of calcium along the cell membranes causes them to act like electrical condensers. Without this condenser function, a regulated existence of cell and organism is not possible.

Returning to the sealing function: according to the membrane model by BÜCHI, we must assume that the membranes have two transverse systems of pores, an active transport pore and a so-called free lipid pore. Only the latter allows entrance of aggressive, and for the cell, "unwanted" substances such as toxins, antibodies and even viruses. The active transport pores only allow, in a controlled manner, nutrients such as amino acids, maybe peptides and sugars to pass. Since the colamine phosphates are mainly positioned near the free lipid pores, calcium colamine phosphate (Calcium EAP) also only hinders access to the free lipid pores. All available clinical and experimental data confirm this assumption, in contrast, however, the nutritive supply to the cell is not diminished by Calcium EAP inserted into the membrane.

In the mid-sixties, we investigated the action of the substance on a number of patients suffering from chronic allergies, immunological and auto immunological conditions according to the criteria of the current knowledge of these diseases. In 1967, a paper of mine appeared in a pharmacodynamic journal giving my observations.

Exactly 20 years later all of these statements were not only verified, but also, in view of the importance of colamine phosphate salts, only now, slowly, a sounder understanding is taking hold.

We must add to this, that only the modern interpretation of the condenser function of the cell membranes, also the Tesla amplifier function of the myelin, and the other physiological discoveries concerning cell membranes (for instance gas exchange in alveoli) are necessary for the understanding of the clinical action of colamine phosphate salts.

Today, after us treating some 2,000 MS patients with colamine phosphate salts with varying positive results, in 82% of USA patients and about 70% of the European patients, we know the chance of success. The

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* the magnesium, potassium and calcium salts of EAP combined.

varying degree of improvements based upon the varying pathogenic mechanisms which cause the disease in the USA compared to all other countries in the world. After the results stayed about the same for about 20 years, it is only recently through the use of colamine phosphate salts plus omega-fatty acid, derived from cold water fish species, and themselves called membrane components, that further improved results in MS treatment were obtained. Furthermore, we have only learned relatively recently that important concentrations of ascorbate are needed to enable the incorporation of EAP into the membranes.

It is, however, new, if one does not count in my 1967 publication, that colamine phosphate salts are found of eminent importance and usefulness in diseases involving disturbed cell membranes. Already in 1967 we could prove the exceptional effects of colamine phosphate salts in cases of chronic kidney diseases, with or without nephrosis, especially however, in diabetic nephropathy (chronic vessel and membrane damage in the kidney due to diabetes). Increases in blood pressure due to diabetic nephropathy, and abnormal elimination of protein are reduced, sometimes to completely normal values. Diabetic retinopathy which affects the small blood vessels in the retina is avoided by the treatment with colamine phosphate salts. DR. KÖHLER, JR., presented all this at the New York Symposium, the results were obtained at the University of Giessen. These proved that diabetic neuropathy, the damaging of nerve conductivity in diabetic animals, was largely cured through the use of colamine phosphate salts.

Every physician and many laymen know, that not only is diabetes pandemic with a high rate of increase in civilized countries, but also the above observances of the disease threaten millions of diabetics in the whole world. Alone, from this point of view, the health protection of colamine phosphate salts can hardly be overestimated.

A further aspect of great importance is the protection and repair effect of colamine phosphate salts in lung disease, especially in reference to the gaseous exchange mechanism of the alveoli. We know for a few years that colamine phosphate salts practically completely eliminate the tendency toward asthma, the development of emphysema and elevated pulmonary pressure. This action is clinically so spectacular that practically all asthma cases are helped except those with simultaneous fungal (Candida) infections of the lungs. One can determine clinically that oxygen saturation of the blood increases with colamine phosphate salts, and what is more important, increased elimination of carbon dioxide leading to more normal levels in the blood, which in return results in the decrease of pulmonary pressure. Obviously, the alveoli system becomes increasingly able to regulate the gas exchange after colamine phosphate treatment (uptake of oxygen and elimination of carbon dioxide).

These eliminate the central reflex triggered by high carbon dioxide tension which is responsible for asthma symptoms and the attack itself. Long years of experience and learning show that this treatment also stops further degeneration of the lungs, especially the development of emphysema. Even

pulmonary function is restored to a degree.

Also, in the case of the above lung diseases, doctors and laymen would understand the great importance of protecting the lung structure and function for the health of millions of people.

There are countless other applications for colamine phosphate salts as applied to the immune processes. For example, in the small vessels, immune disease in sarcoidosis (BOECK'S sarcoid) the treatment is very effective. Neurodermatitis and decalcification conditions are among the more treatable conditions. The unifying therapeutic-functional principle of colamine phosphate salts is at least partly the repair of the cell membrane condenser function. We know that the decrease of the condenser function is the central criterion for what we quite unqualifiedly call "aging". Important functions of the cells, which are necessary to life are tied to this condenser function (between 30 and over 70 millivolts).

We must assure, for the time being, that a well developed condenser function is needed by cell membranes in order to energetically activate repair factors. These factors, further down the scale in their watchfulness over the genetic system, protect against malfunction, and even repair damage. This, again, is an important precondition for the prevention of cancer, which has its cause in the damage of a series of known and unknown genetic structures. Since colamine phosphate salts can also act as calcium and magnesium transporters, they act in two ways. One is the mineral transport itself, and the other is the improvement of cell membrane polarization.

In the past, many multiple sclerosis patients decalcified because of physical inactivity and experienced frequent bone fractures. Since the introduction of colamine phosphate salts, especially Calcium EAP in our sizeable MS patient population, the occurrence of more or less spontaneous fractures, especially of the head of the femur, has dropped drastically, at a high rate of success, instead of practically zero. The development of osteoporosis, especially in post menopausal women, is connected with a considerable decrease in membrane polarization. Accordingly, it should be probable that colamine phosphate salts could reduce osteoporosis over a long time period. One could also expect that the apparent increased osteoplastic activity (resorption of bone tissue despite recalcification) would be regulated to normal. Doctors and lay people know of the increased occurrence of worldwide decalcification conditions, especially in industrialized areas. Very high costs are incurred in treatment of decalcification diseases.

The colamine phosphate salts are in principle not drugs. They are merely the calcium, magnesium, and potassium salts of colamine phosphate, a normal body constituent. Colamine phosphates have an essential function in the structure of cell membranes, as physiological sealers, in electrical neurotransmission (conductivity), and are the basis for formation of the electrical cell membrane condenser.

Some illnesses are caused by the inability to synthesize adequate amounts of colamine phosphate into the body. In MS, this appears to be the initial factor. Therein lies the considerable degree of momentum in this

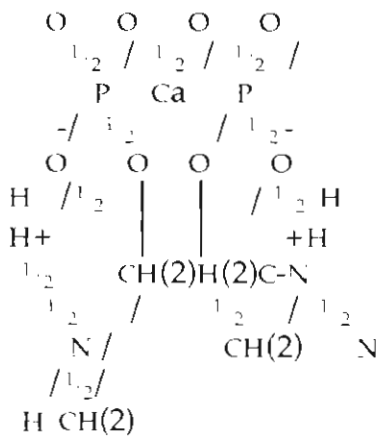
disease. A special case is the so-called Leukodystrophy of children, which may develop very abruptly at the age of 2 to 3 years, because the maturation of the baby's myelin is disturbed. This condition in children can be treated very effectively (drastic reversal in 17 of 18 patients).

Since colamine phosphate salts are endogenous substances and essentially necessary to life, both colamine phosphates and their salts must be added to the list of vitamins.

I therefore suggest the term "Membrane Integrity Factor", or for short, Vitamin M i.

CALCIUM EAP
Vitamin M i—Membrane Integrity Factor

Chemistry:
Calcium EAP has the following formula:



With the designation: monocalcium chelate of
phosphoric acid mono (2-aminoethylester)
Summary formula = C(4) H(14) 0(8) N(2) P(2) Ca
Molecular weight: 320.12
Calcium content: 1 g Calcium EAP = 125.20 mg Ca^{2+}
= 6.24 mval Ca

Diabetic Nephropathy:
Drastic drop in increasing blood pressure. Drastic drop in albuminuria. Normalization of creatinine clearance. Normalization of urine sediment.
Diabetic (II) Regul.:
Drastic increase of glucose tolerance and shift towards better adaptive regulation.
Diabetic Retinopathy:
Absence in the development of diabetic vessel alterations in II-Diabetes. Most

likely same situation with all other small vessels (cerebral, renal, and cardiac, etc.)

COLAMINE PHOSPHATES: Ca-EAP, Phosetamine
Vitamin M i—Membrane Integrity Factor
So far observed medical protective efficacy:

multiple sclerosis	(ca. 82/100)
ALS	(ca. 50/100)
Friedreich's Ataxia	uncertain
Diabetic Retinopathy	(close to total)
Diabetes II Regulation	(close to total)
Diabetic Nephropathy	(close to total)
SCHÖNLEIN-HENNOCH, WERLHOF, immune thrombocytopathy	(close to total)
Pseudo-Croup	(close to total)
Leukodystrophy	(see information given on page 5)

asthma, hypercapnia, degenerative lung diseases, pan-arteriolitis, small vessel disease (close to total)

After more than 25 years of observation the colamine phosphates (Vitamin M i, Membrane Integrity Factor) will possibly turn out as one of the most significant discoveries in protective health care (E. CHARGAFF, FERRARI & FERRARI, KÖHLER & NIEPER, L. LEVI).