



The Importance of Copper – CUPRUCHEHL[®], a Remarkable Medicine from the SANUM-Kehlbeck Company

by Dr. med. vet. Anita Kracke, Naturopath



COPPER

Introduction

The word „copper“ comes from the Latin „cuprum“, meaning „metal from Cyprus“. In nature it occurs in its pure state and one is impressed by its beautiful, warm, reddish-yellow colour which can change from brownish to greenish-blue as a result of oxidation, giving copper roofs, for instance, their typical patinated appearance. The coloration varies, depending on the compound that the copper forms. Copper (I) oxide (cuprite) is red, copper (II) oxide is black, carbonate, sulphate, chloride are green. Because of their beauty, the copper compounds with special colours are favoured for incorporating into jewellery, e.g. turquoise, malachite. Copper is a heavy metal that is very soft and therefore very malleable. It is an excellent conductor of heat and electric current. On account of the last-mentioned properties it is in great demand in industry and by tradesmen. Among other things, coins are produced from copper.

Pure copper seldom occurs in nature, but it can be obtained from copper ores. Along with gold and tin it is one of the oldest metals used by man. It is suspected that this metal was known as early as 7000 BC and was used very early on, on account of its good working properties. Its „golden age“ was between 5000 and 3000 BC, which is why this period is also known as the „Copper Age“, by analogy with the Bronze and Iron Ages.

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Biological Properties

In the adult body there are about 80-120mg of copper; this is stored mostly in the skeleton, but also in the musculature and the brain. This metal is a component of many enzymes and a vital component of metalloproteins, for instance coeruloplasmin and metallothionein. In the lower animals, such as molluscs and arthropods, copper is a component of haemocyanin, which is responsible for oxygen transport and may be compared with haemoglobin in higher beings.

In the blood plasma copper is over 90% bound to a transport protein, coeruloplasmin, which for its part is especially important for the absorption and utilisation of iron. Coeruloplasmin acts like an enzyme and has a catalytic influence on oxidation of bivalent to trivalent iron before this can bond with transferrin and become available for haem formation. This transport protein coeruloplasmin also acts as an antioxidant, thus preventing the peroxidation of fats, which is triggered by iron and copper.

There are several very significant enzymes that are dependent on copper. These include, e.g., peroxide dismutase which, along with copper, needs an adequate supply of zinc. This enzyme is part of the cell defence system and saves the cell membranes from destruction by reactive oxygen compounds. In erythrocytes this is present in high concentration.

The copper-dependent enzymes dopamin β - hydroxylase and

tyrosinase are necessary in order to change the amino-acid tyrosine into dopa, the pre-stage of melatonin and the catecholamines dopamine, adrenaline and noradrenaline. In the mitochondria copper is required, among other substances, as a co-factor of the iron-containing cytochrome c oxidase. This means that the metal is involved in the complexes of the respiratory chain that transport electrons. The copper-dependent enzyme lysyloxidase controls the construction and linking up of the collagenous fibres in the connective tissue, to which cartilage and bone also belong. Thus here too copper is vitally necessary.

These facts demonstrate that copper is of major significance for the immune system, the connective and interstitial tissue, blood formation and the body's oxygen supply, cell respiration, healing of wounds, formation of nerve tissue, skin, hair and their pigmentation.

Free Copper Ions

If copper is not bound to a protein, such as coeruloplasmin for instance, but is present in an ionised form, it has an anti-bacterial action on direct contact. This aspect is known as an oligodynamic effect, and this is also known to occur in the case of silver, mercury, tin, iron, lead, bismuth and gold. This action is based on the fact that the cations of these metals react with sulphurated functional groups of



certain amino-acids and proteins, which are thus rendered inactive. This results in the inhibition of germs in vitro and in vivo. The degree of concentration of the metals of course then determines their toxicity for the macro-organism. At the same time these free ions also peroxidise the lipids of the cell membranes, thus creating free radicals which damage the cell membranes and the DNA. This damage by copper ions also lies at the root of the illness known as Wilson's disease.

Requirement and Uptake of Copper in Humans

The copper requirement of an adult human is quoted as between 1.0 and 1.5 mg/day. The source of an adequate supply is the diet, which generally supplies enough copper. Particularly rich sources of copper are offal, nuts, pulses, fish and shellfish (oysters), plus brewer's yeast. When it is absorbed via the gut, copper bonds with a zinc-containing protein, metallothionein, which is rich in cysteine. Since a certain competitiveness between zinc and copper occurs in this protein, copper uptake is impossible when extreme amounts of zinc are consumed. On the other hand, in illnesses that are characterised by a high copper uptake or a disordered copper metabolism or copper intoxication (e.g. Wilson's disease), the copper can be eliminated by high oral doses of zinc, because the copper is displaced from the metallothionein compound. Displacement of this kind should always be thought of in patients

with iron-refractory anaemia and neutropaenia, because in this case copper uptake is impossible owing to a superfluity of zinc.

Copper Deficiency

Despite an adequate dietary copper consumption, a copper deficiency may occur if, for instance, medicines such as antacids, glucocorticoids, iron, d-penicillin and zinc have to be taken. Especially the long-term daily consumption of more than 50mg of zinc can result in the above-mentioned displacement effect from metallothionein. If the diet contains large amounts of foodstuffs rich in tannic acid and phytates, then in this way copper, as well as other elements, can be bound, and these are then unavailable to be absorbed. Feeding infants exclusively with cows' milk likewise fails to provide sufficient copper. A state of copper deficiency may likewise result from general absorption disorders in the intestinal area (malabsorption, diarrhoea, food intolerances), hereditary disorders of the copper metabolism (Menke's syndrome, Wilson's disease), disordered renal function or loss of coeruloplasmin via the kidneys, plus burns and severe loss of blood.

Symptoms of Copper Deficiency

The consequences of copper deficiency may find expression in the form of:

- Anaemia (hypochromic, iron-refractory, microcytic) with neutropaenia

- High degree of susceptibility to infections
- Disordered formation of collagen and connective tissue (fractured bones, osteoporosis, ruptured vessels, aneurysms)
- Reduced performance, fatigue, weakness, poor concentration, respiratory complaints, neurological disorders with ataxia and reduced myelin production
- Pigmentation disorders of skin and hair.

Menke's kinky hair disease arises from a congenital disorder of the copper metabolism and finds expression in the symptoms described above.

Therapeutic Employment of Copper

From the symptoms of copper deficiency we find the indications for supplementation with copper preparations:

- Cases of anaemia which are shown to arise from a copper deficiency and/or are resistant to treatment with iron.
- Heightened susceptibility to infections or tendency to inflammations, such as e.g. chronic inflammatory bowel disease (IBD). The problems may be aggravated if, in addition, by an increased dosage of zinc, the already disturbed absorption of copper becomes even worse.



- Diseases in the area of skin and hair.
- Diseases of the connective and supporting tissue, such as osteoporosis, fractures and rheumatism. Copper substitution in the treatment of rheumatism is controversial, because significant improvement cannot always be achieved. In some cases in this area copper is also used locally in the form of bracelets.

Copper Excess and Copper Poisoning

Acute copper poisoning may occur from consumption of various copper salts. There is an immediate stomach upset with vomiting, with the colour of the vomit varying between green and blue; this varies according to the copper compound that was taken. Admixtures of blood are also possible. Then comes an unpleasant coppery taste which lasts for days and is accompanied by severe pain in the whole gastro-intestinal area. Characteristics include nervous symptoms, cramps and nephritis starting on the third day, plus liver damage and jaundice. In most cases the poisoning is fatal.

Initially a chronic surplus of copper is stored in the liver. However, if the storage capacity is exceeded, here too there is damage to the liver cells. In that case the patient exhibits vomiting and diarrhoea which may be bloodstained on account of the damage to the mucosa in the gastro-intestinal area. The functional disorder of the liver and the

destruction of erythrocytes result in a yellowing of the skin and mucous membranes. Such copper poisoning may result in kidney failure, cramps and, finally, coma and death. However, it seldom occurs in adults. Children are considerably more susceptible to a surplus of copper. In their case an overdose of copper may even occur after drinking milk from a copper vessel, or water that has stood for some time in copper pipes! Therefore, especially in the mornings, one should always allow enough water to run away from the plumbing before using the water for drinking.

Wilson's Disease

One particular form of copper surplus is Wilson's disease, also known as hepatolenticular degeneration, pseudosclerosis or (*in German*) Morbus Wilson. Resulting from a genetic defect, the excretion of copper is disordered, which leads to an accumulation of copper in the body. Initially liver damage occurs with loss of function; this is followed later, from approximately twelve years of age, by disturbances in the nervous system with disorders of movement, muscular twitches, emotional and mood disorders, memory dysfunction and in some cases even dementia. The lives of patients are made difficult by severe personality changes, accompanied by damage to kidneys, heart and supporting tissue. The severe damage sustained particularly by the liver and kidneys, which may extend to insufficiency, finally

results in death. However, if this incurable disease is recognised in time, the life of the affected person can be almost unrestricted. It is important to minimise the intake of copper, thus preventing a surplus as far as possible.

Copper Poisoning in Animals

The individual farm animals have varying requirements for copper. Thus poisoning symptoms may easily appear in sheep, because they only need small quantities of copper and their tolerance of an excess supply is only slight. The limits may be exceeded if the lambs, for instance, are fed with milk substitutes that are actually intended for calves. Poisoning cases of this kind from an accumulation of copper may also come from hay which was mown near vineyards or on soil which has been fertilised with liquid pig manure. Copper supplements are added to pig feed, because this improves the fattening. If there is a simultaneous molybdenum deficiency, the risk of copper poisoning increases for all animal species. In sheep the ratio of copper to molybdenum must not exceed 10:1.

A special form of copper poisoning is a hereditary copper storage disease common in some dog species (especially Bedlington terriers). In this disease, in spite of the copper intake being normal, there is an ongoing accumulation of copper in the liver with subsequent degeneration of this organ. Thus this disease



picture corresponds to that of Wilson's disease in humans.

Copper in Homoeopathy

Many leading homoeopathic symptoms arise after taking copper salts, with cramping pains, vomiting and diarrhoea in the forefront. Firstly we shall describe the remedy picture of metallic copper:

According to Voisin convulsions, cramps and spasms of the musculature – both of the locomotor system and of the digestive tract – are in the forefront. The violent cramps of the voluntary musculature mostly begin in the periphery of the extremities in fingers and toes and resemble epileptic attacks. The aura begins in the knees and rises to the lower abdomen; this is followed by loss of consciousness, frothing at the mouth and falls. Boericke also describes these symptoms and additionally mentions intermittent pains. Aggravation occurs from touch, at night and from chill. Cramps in the region of the digestive organs may cause nausea, which otherwise cannot be caused by any other medicament. Diarrhoea and colic, as well as black or bloody stools are also part of the remedy picture, as are hiccups preceding the cramps and vomiting. Drinking cold water may provide relief.

As well as these manifestations spasms can occur in the area of the respiratory organs with sensations of choking, with simultaneous cyanosis of the face. Those affected have a sensation as if the chest and

glottis were being constricted, with spasmodic asthma alternating with spasmodic vomiting and severe paroxysms of coughing (like whooping cough).

In the area of the heart the Cuprum induced spasms express themselves in the form of violent cardiac pains, appearing suddenly and then vanishing again. Here too, people suffer from the sensation of being bound tightly, and this is accompanied by fear (fear of death), dyspnoea, facial cyanosis and chilliness of the body.

One particularly prominent symptom, unanimously described, is the overreaction to medicines. Here there is no observable difference between allopathic and homoeopathic medicines, even if the choice and dosage are correctly calculated.

In general exhaustion and hypersensitivity are described; on the emotional level there is a tendency to melancholy, whereas on the physical level metabolic disorders and anaemia are in the forefront. Arising from this heightened reactivity there are fears on the part of the affected person, and these are answered by violent spasms, even after trivial influences.

CUPRUKHEHL®

This medicine is the homoeopathic preparation of copper gluconate. Deviating from the remedy picture of copper itself, this copper compound does exhibit a strong affinity for the digestive tract, but

here the main concern is with inflammatory processes.

According to the homoeopathic remedy picture of copper gluconate, CUPRUKHEHL® is particularly indicated in inflammatory processes in the gastro-intestinal tract and in the renal area. Additionally it is employed before and after operations, because of the favourable influence of copper on the formation of connective tissue structures and on the immune system. In this context it is particularly good to combine it with SANKOMBI® 5X drops.

The preparation is available in the form of drops and injectable ampoules.

In the drops there is copper gluconate in the 3X potency based on ethanol, and in the ampoules is a water-based preparation in the 4X potency. CUPRUKHEHL® 3X drops are prescribed in acute cases, every 30-60 minutes, to be taken orally, 5 drops at a time, whereas in chronic conditions 5-10 drops are taken 1-3 times a day. In ampoule form 2 ml may be injected i.m., i.v., s.c. and i.c. once a day. As with all medications and due to the variations of clinical studies, professional medical advice should be sought prior to recommending this product to women during pregnancy or breastfeeding, as well as with children.

CUPRUKHEHL® 3X drops are on sale in bottles containing 30ml or 100ml. The ampoules of CUPRUKHEHL® 4X contain 2.0 ml



and are available in packs of 10 or 50 ampoules.

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