

CLINICAL APPLICATIONS OF METAL ANALYSIS

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The discussion about the effect of metals on the organism is still discussed controversial. Metals can cause toxic or allergic reactions. The role of certain metals as Cadmium and Nickel in neoplasia is accepted today. Every Implant cause a reaction after their introduction. This can be an apposition of tissue called integration or a dissolving which leads to failure. Still today we are in most cases searching bakterias and dont think about reactions that can be caused by the matial itself. In Orthopedics the implants are close implants whereas in reconstructive dentistry there is a contact between bone and the oral cavity, that means we deal with open implants. In the oral cavity there is a continuous presence of microorganisms, bakteria and oxygen. After placement of an Implant the reaction of the tissue depends on the components released by corrosion too. The corrosin depends on many facts like the surrounding tissue, how the implant is manufactured and the time it stays in place. Therefore it is extremely difficult to find a direct cause of disease after the placement of metals . In orthopedics surgical steel tantal titanium or titanium alloys with or without a layer or treated surfaces ar used. In dentistry additionally amalgams, non precious, semi precious or precious alloys are often used in the same oral cavity.

Therefore in my oppinion we cannot use for an evaluation the maximal dayly intake dose for workers or the lethal dose in the animal model which was discussed a lot in the amalgam discussion. The first deals with healthy workers,, one substance contact period 5 days 8 hours a day. The second with healthy animals (rats or mice who are able to synthetise vitamin c a potent antioxidant) show the lethal dose which we never find dealing with metal implants. In acute toxicity we have diagnostic parameters and treatment protocols whereas in cronic tocity the diagnosis is very difficult because in after placement also other substances contact the organism. Hairanalising a measurement method daily used in court shows us the intake of a substance but the concentration rarely correlates with symptoms. The test of the saliva after chewing for 10 minutes shows us a corrosion rate but is difficult to reproduce. Data about the normal concentration for metals in tissues are rare. Most authors refer to the work done by Ciba Geygy

1979, Williams 1981 or Merian 1991. Chelating substances and their excreted metabolites are life saving in acute poisoning but also there seldom exist a correlation between the concentraciton of the chelated substances and symptoms. (DMPS for the chelation of Hg and other metals and EDTA for the chelation of Pb and other metals). All these tests show us the substances we are in contact with or which are stored by the body. For an ideal clinical diagnosis or therapy we should need to know the individual medical history the genetic predisposition, the interaction of the the different substances, the detoxification capacity, the free radical situation of the organism and the reaction of the materials on the immune system. We can test the detoxification capacity of the liver, the free radicals and the disbiosis or inflammation of the gut but thes tests don't show the specific reaction of a single substance. A further important fact mentioned before is that we deal with alloys and their corrosion products. These can be transformed by microorganisms and can be more toxic as the initial substance. Very often they are able to pass the bloob brain barrier or the placenta barrier.

For the clinical evaluation it is very important to consider that the nerv system is high in fat where these substances can be stored. That means we deal with a lot of nervous disorders which makes the diagnose difficult.

In our office we now use for specific individual testing for metals and other substances in vitro testing. The cltt-cita is a modified lymphocyte transformation test and gives us better results than the path test. The Effector/gentest is used as a tolleration test for materials we want to use in the future. These tests show us the individual predisposition and beware of failures caused by the materials. We saw implant failures if the implant material or the alloy used for the supraconstruction reacted. Single substances, alloys and also their corrosion products can be tested. In our research in dentistry we showed that every metal used in the oral cavity is deposited in the tissues. If the metals are removed the concentration of the metals in the tissues decrease tremendously (Table metals we looked at: Pb, Cd, Ga, Co, Au, In, Cu, Mo; Pd, Pt, Ag, Tl, Bi, Zn, Sn, Hg).

Common or specific symptoms related by the patients with intollerance or allergy to metals

disappeared after removal of the disturbing material. New research done on tips of teeth roots after resections show Formaldehyde Putrescine or Cadaverine in the samples which can probably cause problems in patients with cancer, diabetes or chronic degenerative diseases.

In dentistry they can lead to infection and to implant failure if the implant is next to the inflamed tissue.

If we don't want to have failures and for a predictable long term success we have to remove these substances which cause reactions. We claim that the removal is independent from the capacity to detoxify or eliminate the substance. A treatment with Vitamins, Minerals, Aminoacids, unsaturated fatty acids can be a support but does not replace the removal.

The old principle of toxicology and allergy to remove and to stay away from the substance that causes a reaction is still valid.