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Amalgam: the Core of EU Strategy on Mercury

AMICA and AIOB ask the EU Commission to Urgently Stop the Production and Use of Amalgam

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There is a compelling evidence about the health risks connected to the use of mercury in dentistry as well as about the environmental impact of the use of such dental material. Moreover, the health impact is considerably undervalued because the health professionals are not enough trained to recognize the effects of long term chronic exposure to dental mercury.

The health impact

The SCHENIR position paper about amalgam does not reflex the complexity of the scientific literature about amalgam poisoning and it does not take into account the large number of recoveries from serious illness after the adequate removal of amalgam fillings and proper detoxification.

Already in 2002, Maths Berlin, Professor Emeritus with long experience of the effects of mercury on animals and humans, chairman of the WHO Task Group on Environmental Health Criteria for Inorganic Mercury (1991), wrote for *The Dental Material Commission* of the Swedish Government the report "Mercury in dental-filling materials - an updated risk analysis in environmental medical terms" in which he listed several risks linked to the use of amalgam fillings (1):

- Risk of impairment in the functions of the central nervous system;
- Risk of impairment in kidney function;
- Risk of impairment in the immune system;
- Risk of impairment in foetal development, especially development of the nervous system.

In 2000 Max Dauderer, former Professor of Toxicology at the Technological University of Munich, published the three volumes (2200 pages) of the "Handbook of Amalgam Poisoning" based on his experience on 25,000 cases of amalgam victims (2). The most frequent problems he observed in these patients were:

- Neurological damages and dysfunctions;
- Auto-immune diseases;
- Increase of oxidative stress;
- Lack of enzymes (mainly Glutathione S-Transferase);
- Dermatological effects of systemic allergy to metals;
- Psychological and behavioural problems (mainly depression, anxiety and sleeping problems).

In the early '90s he presented at the Court of Frankfurt a claim against the German producer of amalgam fillings, Degussa. The controversy was settled with an agreement in 1997 and Degussa had to pay 1.200.000 marks (about 600.000 euro) for the research about safer alternative for dental fillings. It is important to point out that during the process Prof. Otto Wasserman and colleagues of the University of Kiel produced, on request of the prosecutor of the Frankfurt, a report claiming that amalgam can have highly toxic effects on the long term (3).

More recently, in 2008, Prof. Max Dauderer sent:

- an application to the European Court of Human Rights for *Amalgam indictment of the Federal Republic of Germany for being responsible for lethal mass poisoning with mercury through dental amalgams - Violation of article 2 of the German Constitution 'Right to life and physical integrity'*; and
- to the International Criminal Court the *Complaint: Mass Death caused by German Dentists using Dental Amalgam*.

The call for justice to these International Courts follows years and years of public appeals by this internationally recognized scientist to the main public health offices in Germany and in Europe. We would like to ask the EU Commission to involve for a consultation the outstanding European scientists with a long clinical experience in the treatment of amalgam poisoning, such as Prof. Max Dauderer (Germany) or Dr. Graeme Munro-Hall (United Kingdom).

Without the proper diagnostic tests and clinical experience it is very difficult to recognize the adverse health-effects of amalgam. The allergy to the metals of amalgam, for example, is very undervalued issue because the lymphocytes transformation test (LTT-MELISA) is not available in all the EU countries. This is the specific test for the diagnosis of allergy of type IV that is the most common type of allergy to metals, while skin provocation tests (such as patch test) can prove mainly the allergy of type I ("immediate allergy" or "contact allergy"), that is very rare in the case of metals.

The same problem occurs with other important diagnostic test for amalgam poisoning which are very difficult to find in many EU countries: 1) post stimulation multi-element analysis of metals in saliva (also known as "chewing-gum test" (4-7) and 2) DMSA/DMPS challenge test that measures the levels of toxic overload (8-12). Consequently, there are people with systemic reactions to the metals of amalgam who can not have an appropriate diagnosis and treatment.

Moreover, even when the allergic response to amalgam is certified, the medical treatment is quite uncertain. This is what happens in Italy where the law leaves the patient with allergy to amalgam without a clear solution to this problem. The regulation of amalgam by the Ministry of Health (Decreto Ministero della Salute, 10th October 2001), is quite advanced, prohibiting its use in children under the age of 6, in pregnant women, in people with kidney problems and in patients with allergy to the metals of amalgam. However, in such allergic patients, the removal of amalgam fillings is forbidden because of the risks of exposure to mercury vapours during the drilling (13).

At present the European amalgam patient (i.e. the person with official recognition of amalgam chronic poisoning) is left alone without solution because public health facilities rarely have the expertise to treat these cases. In Italy, in fact, there are a very few documented cases of amalgam patients who obtained the official reimbursement by the National Health System to get proper treatment in specialized centres in Germany. However, the chelation of mercury with DMPS, DMSA or EDTA is always a treatment posing risks of severe side effects and very often the mercury induced-injuries are irreversible.

The lack of training of the medical profession for the diagnosis, treatment and prevention of the complications of chronic exposure to dental mercury should be considered as one sufficient reason to avoid using this material since now.

The difficulties in the diagnosis are even more obvious in the case of the amalgam toxic load inherited by the newborn from the mother. It is widely known that the mercury burden can pass from the pregnant woman to her foetus during pregnancy and to her newborn baby during breast feeding (14-21). The mercury from amalgam could be responsible for neurodevelopmental disorders and behavioural problems, including autism (20-22).

Interaction of environmental and genetic factors

The European Parliament recognizes that (see point H) there is “the emergence of new diseases or syndromes, such as multiple chemical hypersensitivity, dental-amalgam syndrome, hypersensitivity to electromagnetic radiation, sick-building syndrome and attention-deficit and hyperactivity syndrome in children” in the “Mid-term review of the European Environment and Health Action Plan 2004-2010”, approved in Sept, 4 2008 (23). This document is particularly interesting not only because there is a clear call to take measure to stop the increase of such health conditions, but because all these conditions could have a same environmental basis in which mercury can play a central role.

The role of amalgam fillings should be considered, in fact, as a main factor in the increase of **environmental diseases** on a larger scale because mercury and other heavy metals interact with the ability to metabolise xenobiotics and are responsible for the increase of oxidative stress (24-27). The exposure to dental mercury represents, then, a factor of susceptibility to the adverse effect of the exposure to other kind of toxins using the same metabolic pathways of mercury in a synergistic effect that can increase the risk for cancer and for the onset of chemical sensitivity. Mercury is, in fact, one of the major factors in the onset of Multiple Chemical Sensitivity (MCS), one of the most disabling conditions in our society (28-31) and of other related conditions such as Chronic Fatigue Syndrome and Fibromyalgia (32-33).

There is a completely new health risk that has to be considered when dealing with heavy metals: **the interaction between electro-magnetic fields and metals**. A recent study demonstrates a significant release of amalgam ions in people using the mobile phone and having magnetic resonance: (34). Since the use of wireless technologies and electric devices is so spread and relatively new, reviews of studies should consider this aspect, of the so-called “galvanic effect”, in the evaluation of the side effects of the use of mercury in dentistry.

Finally, it is known that several illnesses comes from the **interaction between genetic and environmental factors**. This seems to apply to the case of Hg brain injury and Alzheimer. These two conditions seem to have in common the kind of lesions observed and the Reduced Enzyme Activity in the brain (35-37).

Recent studies, then, have found a significant correlation between the genetic predisposition to AD and mercury exposure. The age of onset of AD in the population is associated with the genetic variation of apolipoprotein-E, a protein in the brain and in the cerebrospinal fluid that transports cholesterol. It comes in three genotypes: apo-E2, apo-E3, and apo-E4.

The apo-E2 has the most capacity to bind and remove divalent toxic metal atoms such as mercury as it moves from the brain into the cerebrospinal fluid, and out into the blood and it seems to have a protective role from AD.

The apo-E3 has an intermediate capacity to bind and remove divalent toxic metal like mercury from the brain, while apo-E4 has the less capacity so it is considered a genetic susceptibility to the early onset of the AD. This may explain how the proven genetic susceptibility to AD of the APO-E4 carriers is connected to the de-toxification of Hg and other heavy metals.

At present dentists do not offer this gene test before offering amalgam fillings as an option as dental filling.

From the point of view of public health, at the moment, there isn't any real argument to choose amalgam as a dental fillings since the alternatives are equally effective also for molar teeth (even the SCHENIR paper claims that dental health can be adequately ensured by both amalgam and alternatives).

The environmental impact

Bio Intelligence Service Report on Mercury Strategy suggests that amalgam is the first source of exposure for mercury vapours while food is the main one for methylmercury. This should be further discussed, because several studies, since the '70s, show that amalgam releases every day Hg vapours and also several metal ions that can be easily methylated by the oral and gut bacteria and yeast (6, 38)

There is also another major aspect of amalgam impact on the environment which is not fully considered in the Bio Report: the air contamination inside and around the dental offices. There is a long literature about how the dental studio can be a major source of mercury contamination of the water, even if separators are provided, but the need for adequate ventilation and air purification has to be stressed more also in defence of the neighbours of dental office.

There is a significant release of mercury vapours during the pose and removal of amalgam and, in fact, amalgam is considered a major occupational concern for the dental professionals since the early '60s (39-52). Paradoxically, they are the first to be exposed to the risks of dental mercury and the least to recognize the effects of such dangerous metal(!). The removal of amalgam should always be done in safe conditions for the patients:

- oxygen mask or clean air supply;
- rubber dam;
- drill at low speed;
- strong suction, like "Clean Up";
- preferably drilling the tooth around amalgam to disengage it in one piece, in order to avoid mercury vapours;
- protective glasses;
- charcoal before removal.

and for the dental professionals:

- mask with charcoal filters;
- protective glasses.

The mercury contamination from dental studios is a serious problem for many years to come because, **even if amalgam is phased out now, there will be still millions of patients who need to remove their old fillings.** Thus, not only the use separators should be mandatory in the dental offices, but also the use of air purification systems, at least in the room where amalgam is removed, and the use of protocols for "safe removal" of old fillings.

The social costs of amalgam

Some dental professionals claim that amalgam can not be banned because it is the most cheap and effective material. This is simply untrue. Amalgam is cheap for the dentists who don't want to upgrade their own skills and techniques, while it is the most expensive material if you count the environmental costs and clean-up costs.

Such costs are paid by the society in terms of:

- productivity and hours of work lost;
- disability pensions;
- health services;
- social services for the disabled;
- cleaning up of the environment.

Since the number of amalgam victims is expected to increase, in parallel with the spreading of the knowledge about the adverse health-effects of amalgam and the tests to certify this condition, the public health authorities may face an increasing demand of safe removal of old mercury fillings. It is proved, in fact, that “Removal of dental amalgam leads to permanent improvement of various chronic complaints in a relevant number of patients in various trials. Summing up, available data suggests that dental amalgam is an unsuitable material for medical, occupational and ecological reasons”. (53)

Citizens in Action

EU citizens organized petitions to strongly demand the public health authorities the final ban of amalgam. The Luxemburg Appeal is signed by more than 15,000 European: <http://www.akut.lu/amalgam/luxemburger-appell/luxembourg-appeal/index.html>

At the end of 2009 almost 90 NGOs and scientists from all over the World launched a petition addressed to the EU Institution to ask for the complete phase out of mercury dental fillings.

English version <http://www.ipetitions.com/petition/stopdentalmercury/signatures> 991 signatures

Spanish version <http://firmemos.es/stopalmercuriodental> 236 signatures

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AMICA is a EU based NGO and it is member of the Zero Mercury Working Group.

AMICA and AIOB are both members of the World Alliance for Mercury-Free Dentistry

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