

Comments from Swedish Association of Dental Mercury Patients

During previous contacts with EU regarding dental amalgam, the Ad-Hoc Working Group on dental amalgam, we formed a coalition of patient organisations and representatives from some of them participated in 2 meetings in Brussels. The Swedish Association of Dental Mercury Patients is one of the patient organisations and I am the deputy director and responsible for scientific matters. We also cooperate with the Sw. Chemical Inspection Agency regarding a reduction of mercury use.

Sincerely

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To:

Commission of the European Communities

Directorate-General

Environment

Env.G - Sustainable Development & Integration

ENV.G.2 - Industry

Comment on the consultation document

Development of an EU Mercury Strategy

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GENERAL

The consultation document: Development of an EU Mercury Strategy does not adequately cover the environmental and health aspects of mercury use in dentistry. Dental organizations with their continuing use of an 19th century material tend to downplay the toxic and environmental effects of mercury release. Earlier they completely denied that any mercury was released at all, despite this having been demonstrated already in 1882.

There are some aspects which make it clear that the environmental impact is much more severe than releases from dental clinics and from crematoria, point sources which can be reasonably well controlled by the use of amalgam separators and filters. The excretion of mercury and also silver in feces and urine (mostly feces) from every person with amalgam fillings is not controllable with filters but only by rapidly phasing out amalgam use, thereby stopping it at its source. Alternative and much less toxic materials are available, not one single material which can replace amalgam but a collection of materials which together can replace amalgam. When dental associations state otherwise they are not telling the truth since there are numerous dentists who have not used amalgam for years. Also the Swedish Health and Welfare Board has acknowledged that a range of new materials can together replace amalgam and the Swedish Dental Insurance System does not anymore subsidise amalgam.

The mercury problem is severe and e.g. a study demonstrated increased global atmospheric concentrations of mercury of 1.46 % per year (Slemr & Langer, 1992). Despite current efforts to reduce mercury emissions the mercury problem will persist for hundreds of years. Pike from Swedish lakes are expected to have half the current levels in about 250 years (Hakansson, 1996)

The health effects are difficult to diagnose but can from a scientific point of view be expected to have a severe impact (Nriagu, 1988) and "any long-term exposure may therefore be expected to progressively cause more severe disruptions in the normal functioning of the organ systems where the metals are accumulating" (Nriagu, 1988).

The efforts to curb mercury emissions should be encouraged but the continuing use of amalgam will cause ridicule in a growing segment of the population when more and more persons become aware of what they have in their teeth. Mercury is poisonous, also amalgam which is carved away during amalgam placement. It is poisonous when drilled out and should be handled as toxic waste. In

between it is considered completely harmless by the dental profession, an equation which is hardly credible. As an example: A Swedish woman phoned me and told that she had an amalgam-filled tooth extracted and wanted to take it with her in a box. The dentist refused this because it was hazardous waste!

Regarding the health effects of amalgam in place in the teeth our organization might possibly be considered biased but an increasing number of scientists around the world report of considerable exposure to mercury (and silver and copper) from amalgam, an exposure which far exceeds that from food.

In addition other researchers report toxic, immunological and other effects at ever lower concentrations of mercury, effects which disrupt the normal functioning of the cells and their integration to a functioning whole. The recent Swedish Dept. of Health evaluation "Dental Materials and Health" (SOU 2003:53) included a risk evaluation by prof. Maths Berlin, former chairman of the WHO task group on environmental health criteria for inorganic mercury (Environmental Health Criteria 118, Inorganic Mercury, WHO 1991). Some quotes: "Mercury is thus a multipotent cytotoxin that intervenes in the primary processes of the cell. This creates scope for a broad spectrum of possible side-effects." "low doses of mercury vapor... These effects in animal experiments resemble those observed after exposure to methyl mercury. However, the dose of mercury that yields the effect has been only about one-tenth of the dose of mercury that exerts an effect following exposure to methyl mercury." (monkey experiments on foetal development).. "amalgam must be considered an unsuitable material for dental restoration."

SLUDGE

6 years of sludge addition increased chromium and mercury content in soil linearly with amount of sludge addition. Increase approx. 25 times compared to pre-sludge conditions (Williams et al. 1985). In Goldstone et al (1990) approximately 2 % was found to be methylmercury. Heating of sludge as done in some countries releases 95 % of the mercury to the air (Balogh & Liang, 1995). Another study showed an increase of 75 times Hg in soil after sludge application and a release of 12-24 pg/m²/h to air as methylmercury and ~100 ng/m²/h as inorganic Hg (Carpi et al, 1997). An estimate of total emissions to air after sludge amendment was about 5 tons/year in Europe and US together (Carpi & Lindberg, 1997).

The Hg content in soil affects the soil microbiological activity with decreased diversity (Muller et al, 2001).

At least half of the Hg in sludge originates from Hg in feces, some from dental clinics. Amalgam separators are not efficient enough. Calculated on particle removal they are efficient but not on dissolved Hg and very fine material. Arenholt-Bindslev & Larsen (1996) measured a release of 270 mg/dentist/day without separators (range 65-842) and 35 mg/dentist/day with separators (range 12-99). The mercury removal efficiency was only 26.5-61.8 % for a large clinic in contrast to 92.3-99.9 % for particles. For a one-chair dental office higher 80.8-94.7 for total mercury (Drummond et al, 2003). Many dental clinics demonstrate incompetence in handling mercury and separators and most clinics have not cleaned the sewage system for many years. (Lonnroth & Shahnavaz, 1996). The drain pipes can contain kilograms of mercury

Dental waste water contain bacteria which methylate mercury to a level which is magnitudes higher than found in the environment, ppb levels for dental wastewater compared to ppt levels in water from the environment (Stone et al, 2003).

The dental office separates water from air (from aspirators). The air is usually emitted to the outside. A measurement showed that the air contained high levels of mercury, often exceeding industrial permissible levels. There is no control of whether anyone can be exposed (Rubin & Ho, 1996).

Amalgam releases Hg into saliva. A study by Leistevuo et al, (2002) demonstrated that 20.5 % of examined persons with amalgam exceeded the permissible level in wastewater of 0.05 mg/l (EU). (Williams DE et al, 1985)

MASSIVE EXPOSURE FROM MERCURY FILLINGS AND DENTAL PROCEDURES

Amalgam fillings release mercury into the body. The mercury will eventually end up in sludge, in crematoria or is emitted to the air. Numerous studies have shown that for most of the population amalgam is the major Hg source. If there is also exposure from e.g. fish the situation will be worse. Some studies: Engin-Deniz et al, 1992; Aposhian et al, 1992; Willershausen-Zonnchen et al, 1992; Drasch et al, 1992; Willershausen-Zonnchen et al, 1994; Drasch et al 1994; Begerow et al 1994, Skare & Engqvist 1994; Arvidson et al, 1994; Drasch et al 1995; Liang & Brooks 1995; Skare, 1995; Sallsten et al 1996; Oskarsson et al, 1996; Sellars et al 1996; Bjorkman et al 1997; Engqvist et al 1998; Galic et al 1999; Leistevuo et al 2000; Nylander et al 1987; Hahn et al 1990; Barregard et al 1995;

BIOLOGICAL EFFECTS ON HUMANS, ANIMALS AND CELLS

Numerous studies have also demonstrated the long persistence of mercury in the body (Hargeaves et al 1998) and long-lasting effects (Kishi et al 1993).

Mercury affects numerous cellular functions at low levels e.g. production of free radicals (Shainkin-Kerstenbaum et al, 1992; Olivieri et al, 2000; Ronnback & Hansson 1992; Bernaudin et al 1981; Hultman et al 1994; Hultman et al 1998; Tibbling et al 1995; Pollard et al, 2001; Cantoni et al 1982)

Mercury affects both the health of dental personnel and patients (Lonnroth & Shahnavaz 1997; Olsson & Lindh 1997; Engel 1998; Lindh et al 2001; Pizzichini 2002; Mortada et al 2002; Lindh et al 2002; Ahlbom et al 1986; Nylander 1989; Ngim et al 1992; Woods et al 1993; Echeverria et al 1995; Bittner et al 1998; Echeverria et al 1998; Wingren et al 1995; Pizzichini et al 2003; Dunsche et al 2003; Magnin et al 2003; Holmboe-Bang 1999; Via et al 2003; Holmes et al 2003)

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