



BIO-PROBE NEWSLETTER

Volume 3

June 1986

Issue 3

SPECIAL ARTICLE

Jaro Pleva.....2

REVIEWS/ABSTRACTS

Thermal effect on mercury dissolution and microstructure of amalgams. Takahasi Y. et al.....7

The relation between saliva and mercury vapor from amalgam restorations. Cruz A. et al.....8

Surface characterization of amalgam using XPS. Hanawa T. et al.....8

Evaluation of a new glass ionomer cement. Marker V.A. & Miller D.L...9

Examination of eugenol mutagenicity utilizing the mouse micronucleus test. Woolverton C.J. & Fotos P.G.....9

Effect of lead on tissue deposition of mercury in mice. Sin Y.M. et al.....10

Lead and mercury toxicity and the rod light response. Tessier-Lavigne M. et al.....11

Multiple metallic mercury emboli. Cassar-Pullicino V.N.....11

EDITORIAL Disciples Take Heed. Sam Ziff.....12

CASE HISTORIES.....13

FORUM

Association Francaise d'Odonto-Stomatologie Preventive.....14

DPT vaccine has .01% thimerosal.....14

Boston University Seminar, Nov 14-15, 1986. Victor Penzer.....14

Dr. Victor Penzer and Dr. Robert Baratz to debate.....15

Michigan Dental Association changes code of ethics.....15

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The Bio-Probe Newsletter is published bi-monthly

Editorial office located at 4401 Real Ct., Orlando, FL 32808

Subscription price \$65.00 per year. Postage paid at Orlando

A special note concerning identification of the February 1986 issue of Bio-Probe. Volume 3 Issue 1 was erroneously dated February 1985. To compound this error the opening paragraph of Part II on Detoxification in Volume 3, Issue 2, April 1986, again erroneously refers to Volume 3 Issue 1 as being dated February 1985. Please correct the dates on these issues.

This June issue of Bio-Probe should have contained Part III of the Detoxification series. However, the Special Article by Dr. Pleva as well as the other data presented in this issue was considered sufficiently important to defer Part III until the next issue.

SPECIAL ARTICLE

Jaro Pleva, Ph.D.

Dr. Pleva holds a Ph.D. in corrosion chemistry and has been a very vocal adversary regarding continued use of mercury amalgam as a dental filling material. Dr. Pleva can cite his own case history of mercury poisoning from amalgam fillings and clearance of medical problems after replacement of his mercury amalgam fillings as the initial basis for his professional interest in the subject of amalgam corrosion in vivo. The following information has been taken from a letter sent to Bio-Probe by Dr. Pleva with permission to use all or part. I have taken the liberty of paraphrasing some of the data:

The Swedish Social Welfare Board commissioned two professors in Odontology (Per-Olof Glantz, Malmo University and Maud Bergman, Umea University) to conduct a review of the risks of dental amalgam fillings deteriorating, releasing mercury, and causing a danger to health. In their report dated Nov 11, 1982, the two professors state (literal translation): "It must be stressed here, that in spite of extensive use of dental silver amalgam fillings,..., and in spite of clinical and roentgenological observations of individual amalgam fillings over several decades, a systematic dissolution of such fillings has never been reported." The summary of the report stated: "In our opinion, the available scientific literature does not contain any scientifically confirmed results, which would indicate a clinical systematic deterioration of silver amalgam fillings. Correctly handled, the fillings which fulfil existing specifications, do not set free toxic amounts of mercury and/or other heavy metals over long time periods."

The report by Glantz and Bergman is the main foundation for the official position of Swedish state authorities regarding the question of mercury poisoning from dental amalgam. Because of this, Dr. Pleva has written in rebuttal to the Attorney-General and to the Ombudsman (The Swedish Parliamentary Commissioner for the Judiciary and Civil Administration) providing the following data:

In reality, there is a glut of published data, showing that amalgams are unstable and prone to corrosion attack (dissolution). The many reports in international scientific journals could hardly have escaped the professors attention. Therefore, their declaration is a

conscious untruth, providing false information threatening the health of millions of people.

Appended hereto are quotations from some of the readily available major dental journals clearly showing that a systematic degradation of silver amalgam normally occurs both in vivo and in vitro. This fact has been known for a long time. However, neither dentists nor toxicologists and physicians are aware as to how much mercury is actually released due to corrosion attack. Consequently, the toxicologic non-consideration of the health risks related to mercury being released from amalgam fillings is to a large degree based on the false claims and premise that amalgam is a "stable" alloy. Therefore, the toxicologic risk evaluation should also be considered invalid.

The doctors have accepted the claims about "stability" of amalgam and their belief in this false information could result in incorrect diagnosis of thousands and probably millions of mercury filling poisoned patients.

Below are two examples of a simple estimate of the mercury amounts corresponding to a measured intensity of the corrosion attack:

On the basis of depth of corrosion attack.

1. Espevik and Mjor (in Degradation of Amalgam restorations in vivo. Corrosion and degradation of implant materials, ASTM STP 684, 1079, pp.316-327) at NIOM (Scandinavian Institute for Dental Materials) have observed depth of corrosion .2 mm after 3 years in vivo.

For a case of general corrosion of a filling containing 50% Hg this would give up to 130 milligrams Hg in 3 years, i.e., over 100 micrograms Hg/day from a surface of 1 cm².

The most corrosion sensitive gamma-2-phase Sn₇Hg contains about 20 weight-% mercury. Under the most optimistic assumption that the corrosion attack is restricted to the gamma-2-phase (which is not true), and only 10% of the fillings consists of gamma-2, the following amount of mercury can be released from 1 cm² surface:

$$(0.2 \times 10 \times 10) \text{ mm} \times 2\% = 0.4 \text{ mm}^3 \text{ Hg}$$

At assumed density of amalgam 11.5 g/cm³ the dissolved volume will give 0.4 mm³ x 11.5 mg/mm³ = 4.6 mg Hg released in 3 years, i.e. 4.2 micrograms/day.

From a number of fillings with a total surface of 10 cm² it is 42 mcg/day.

On the basis of measured corrosion current.

2. Marek (in Acceleration of corrosion of dental amalgam by abrasion. J Dent Res. 63(7):1010-1013, July 1984) has investigated several types of amalgam. He found that the most corrosion resistant amalgam type corroded with a rate about 3 microampers/cm², no abrasion included. According to Faradays law and assuming a uniform distribution of corrosion current, the above current gives:

$$m = i.t.M.$$

$$\text{-----} = 250 \text{ mcg Hg/day from } 1 \text{ cm}^2$$

z.F.