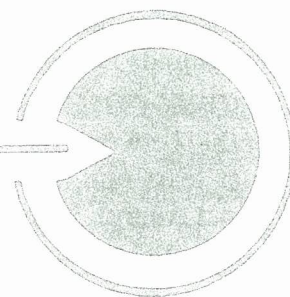


BIO-PROBE

NEWSLETTER



Volume 7

July 1991

Issue 4

MERCURY FILLINGS AND ANTIBIOTIC RESISTANCE

Bio-Probe has previously reported on an abstract published in the "Physiologists" journal in August of 1990 (BPNL, Vol. 6 No. 5, Sept 1990) and reported at the Annual Meeting of the American Physiology Society in October of 1990. The investigators inserted amalgam fillings into the teeth of 2 monkeys and followed them for 3 months. Within 2 weeks, mercury released from the amalgam fillings caused a large proportion of the common mouth and intestinal bacteria to become resistant to mercury and to antibiotics.

The research team has now duplicated these results on 2 additional monkeys which were followed for 5 months, including removal of the amalgam fillings and comparison of findings. The results were reported at the 1991 Annual Meeting of the American Society for Microbiology on 7 May 1991. The abstract follows:

Summers, AO; Wireman, J; Totis, PA; Blankenship, J; Vimy, MF; Lorscheider, FL.

Mercury Released from Dental "Silver" Fillings Increases the Incidence of Multiply Resistant Bacteria in the Oral and Intestinal Normal Flora.

ASM Annual Meeting, No. A137, Dallas, TX, 5-9 May 1991.

Mercury (Hg) released from dental amalgam ("silver") fillings is a commonly ingested toxic substance. However, the question of the bioavailability (and, thus, the toxicological relevance) of dental amalgam Hg has been disputed. We asked whether the incidence of Hg resistance in gingival and fecal bacteria is altered by installing dental amalgams. Sixteen small occlusal surface amalgam fillings (total mass 1500 mg Hg) were inserted under general anesthesia into wild-caught adult monkeys using standard dental procedures (2 monkeys each in 2 experiments). Monkeys were individually housed and fed an antibiotic-free diet. Duplicate fecal and gingival samples taken from each monkey during 10 days prior and 30 days after

amalgam installation were cultured for enterobacteriaceae and enterococci, and for oral streptococci and staphylococci, respectively. In 3 of the 4 monkeys Hg resistance in all bacterial populations was low or undetectable prior to amalgam insertion and for 7-10 days post-insertion; one monkey had detectable Hg resistant enterococci prior to amalgam installation. From 10 days post-amalgam insertion until termination, the levels of Hg resistance in the gingival and fecal bacteria in all monkeys averaged 30% (range 1-100%). Hg resistant isolates were typically also resistant to at least one and often several antibiotics (e.g. tetracycline, ampicillin, streptomycin, chloramphenicol, or sulfadiazine). All Hg resistant enterobacterial isolates examined thus far are capable of reducing Hg(II) to Hg(O), as expected. Thus, constant exposure to Hg arising from dental amalgams (ca. 3.5

TABLE OF CONTENTS

<i>Mercury fillings and antibiotic resistance. Summers et al.</i>	1
<i>New research on dental amalgam from Sweden</i>	2
<i>Ethics and dental amalgam removal. Letter to the Editor of JADA. Barsh L</i>	4

SCIENTIFIC REVIEW

<i>The release of elements of dental casting alloys into cell-culture medium. Wataha et al</i>	7
<i>Lung & Blood Superoxide Dismutase Activity in mercury vapor exposed rats: Effect of N-acetylcysteine treatment. Livardjani et al</i>	7
<i>Dose and duration related methylmercury deposition, glycosidases inhibition, myelin degeneration and chelation therapy. Vinay et al</i>	7

FORUM

<i>Exposure to mercury declared "Assault with a deadly weapon"</i>	8
<i>IAOMT Annual Scientific Session</i>	8
<i>IAOMT Winter regional meeting</i>	8

© Copyright Bio-Probe, Inc. 1991 The Bio-Probe Newsletter is published bi-monthly. Sam Ziff Editor. Editorial office is at 4401 Real Ct., Orlando, FL 32808. Subscription price is \$65.00 per year.

ppm in feces and 4 ppm in gingiva in these experiments) constitutes continuous selective pressure for the maintenance of multiply resistant bacteria in both oral and fecal normal flora of primates. The number and types of plasmids in these strains is being assessed.

AUTHORS' COMMENTS: Oral and intestinal bacterial populations are very complex and may differ considerably between individual animals. Since bacterial samples were obtained during the 10 days before and for at least one month after the installation of amalgam fillings, each animal served as its own longitudinal control. In the 5 month study, the amalgam fillings were replaced by composite resin fillings after two months and the proportion of resistant bacteria declined during the subsequent two months.

The authors further noted that since dental amalgam is a greater source of mercury exposure for humans than any other non-occupational source (including food), it is likely that dental amalgam mercury is a selective agent which increases the prevalence of plasmid-associated mercury and antibiotic resistances in the oral and intestinal bacteria of humans. It has been fully documented that such resistance plasmids can compromise the effectiveness of antibiotics used in the treatment of bacterial infections. Plasmids are movable genetic agents that transfer genes between strains of organisms.

BIO-PROBE COMMENT: It is clear that the findings of this research team is of the utmost importance to the medical community and to patient health. Antibiotic resistance is a rapidly increasing threat to patient therapy. The implications of this research, therefore, are dramatic. The lead author of these studies, Dr. Anne O. Summers, is a widely respected microbiologist and one of the world leaders in her field. The American Society of Microbiology and the American Physiology Society are certainly valid authorities.

These findings do not even depend on the transfer of dental amalgam mercury into body tissues or calculation of body burdens. The harmful effect occurs before the mercury enters the body. Further, the finding that these mercury resistant bacteria convert ionic mercury to the lipid soluble non-valent form of mercury means that more of the mercury is potentially able to enter the body of the host.

NEW RESEARCH ON DENTAL AMALGAM FROM SWEDEN

Pro-mercury dental spokesmen have recently made reference to new research by M. Molin demonstrating the harmlessness of mercury amalgam dental fillings. Their reference is the following:
Molin, Margareta.

Mercury Release From Dental Amalgam in Man
Swedish Dental J. Suppl. 71. 1990.

This report is actually a compilation of four published studies by M. Molin and others in various dental journals. Before discussing the design and execution of the individual studies, it is interesting to note Dr. Molin's own conclusions:

- The significant positive correlations between the plasma-mercury level and the number of amalgam surfaces as well as the total amalgam surface area respectively, and the fifty per cent reduction in plasma-mercury after amalgam removal shows that dental amalgam contributes to the mercury concentration in plasma.
- The significantly increased urine mercury level after amalgam placement and the seventy-five per cent reduction in urine mercury level after amalgam removal shows that dental amalgam contributes to a major part of the mercury concentration in urine.
- The results indicate that mercury release from dental amalgam does not influence the selenium status in man.
- Supplementary blood and urine analyses were carried out in order to evaluate any possible effect of mercury released from dental amalgam on blood cells and erythrocyte components, electrolyte balance, liver function, inflammatory activity, immune stimulation, tissue damage and kidney function. The results for the components chosen for analysis did not indicate any changes in organ functions.