THE EFFECTS OF MERCURY ON DENTAL PERSONNEL

Michael F. Ziff, D.D.S. & Sam Ziff

How can dental patients be at risk from having mercury amalgam fillings if dental personnel are not suffering adverse health effects from the occupational exposure to mercury?

This is a frequently used argument to justify the continued use of dental amalgam. Unfortunately, there is no valid scientific data available to justify such a conclusion. The most commonly utilized reference to defend this position is an ADA report on the health status of dentists, published in 1975. (1)

Even a cursory examination of this study reveals that it has no data whatsoever relevant to the use of dental amalgam fillings. Health parameters of the subjects (dentists) were compared with figures on the general population. Neither the subject group nor the control group were divided into those with and without mercury amalgam fillings, nor was the dental group divided into those who worked with mercury and those who did not. Dentists might very well have statistically fewer amalgam fillings than the general population. Had these criteria been considered, the results may well have been entirely different. In any case, the study certainly is not a scientifically valid demonstration of the safety of mercury amalgam fillings in patients.

Might we expect dentists who work with mercury to have greater exposure than patients with mercury amalgam fillings?

Maybe - maybe not! There are variables that simply cannot be ignored. In view of the dental health awareness and economic status of dentists, it is not likely that they will have an intra oral exposure that is statistically comparable to the general public. The significance, therefore, is the comparison of absorption of mercury from sources directly within the mouth to those sources outside of the mouth. Since the primary concern at this time is the inhalation of vapors of mercury, it then becomes imperative that exposure/absorption factors be considered; these would include the distance of the sources from the lungs, the dilution of the source in the operating room versus that of the source within the mouth, the temperature differences of the two sources, and the constant stimulation of mercury vapor from the intra oral source by various functions. It must also be considered that, in most modern dental offices, very few
dentists actually mix or handle the amalgam; this function is almost exclusively performed by dental assistants, who work in much closer proximity to the amalgam and its instrumentation. It might be more valid, therefore, to investigate health status of dental assistants, rather than dentists.

Are there any published studies available that investigate the health status of patients with and without mercury amalgam fillings? - NO!!! There should be, in view of the serious nature of exposure to mercury vapor, but there aren’t. This is a profound shame and embarrassment to the dental community and the government health agencies, but a fact of life nonetheless. Given the recent proliferation of research demonstrating patient exposure to mercury vapor from their amalgam dental fillings, this type of research should have received the very highest priority. Someday, someone will have to answer for this neglect.

Since the responsible parties have failed to conduct broad studies on the patients, it may well be interesting to look at what investigations have been conducted on the effects of occupational exposure to mercury on dental personnel. There have been a number of case reports of dentists poisoned by mercury in the workplace and even the death of a dental assistant attributed to occupational exposure to mercury. One would expect that these reports should have stimulated an intense investigation.

This, strangely, has not been the case. An example of the type of "research" provided can be found in the following "study". (3)


"A detailed questionnaire was mailed to a random sample of 29,514 male dentists and 30,272 female dental assistants. More than 70% of the dentists (21,634) and dental assistants (21,202) responded. The questionnaire requested information concerning practice specialty, use of anesthetic agents, use of mercury amalgams, and health and pregnancy history of the respondent (for male dentists, their wives) for the years 1968 to 1978."

"Mercury exposure was divided into three groups. As few dental professionals (less than 10%) reported no exposure to mercury, the zero and low mercury exposure groups were combined for statistical comparison." The 'low exposure' group were those who placed 0-40 amalgams per week; those placing more than 40 amalgams per week were placed in the 'high exposure' group.

"When analyzing pregnancy outcome, spontaneous abortion was defined as loss of the product of conception before the 20th week of gestation." "The congenital abnormality rate was based on the number of live-born babies with one or more abnormalities (skin lesions excluded) per 100 births."

Results: "Neither direct nor indirect mercury exposure at the two levels defined in our study had a statistically significant effect on the rate of spontaneous abortion or the incidence of congenital abnormalities in the offspring of dentists or dental assistants who were exposed to mercury."

It is hard to believe that a 'study' of this nature with those conclusions could be published in a respected, supposedly peer-reviewed journal. As the ADA is continually citing this particular study to "prove" that amalgams are safe and present no significant problems to pregnancy or pregnancy outcome, we thought our readership might find it interesting to see what the underlying scientific facts contained in this study really were. There are several aspects of this study and the 1980 Cohen et al. study, upon which it was based, that require clarification:
1. In the Cohen et al study the dentist mailing list contained the names of 107,771 dentists of which 1616 were female dentists. Questionnaires were sent to 1136 of the 1616 and 83% or 921 of the female dentists queried returned completed questionnaires. However, Cohen et al. elected not to analyze or use the data from this group because "the number of respondents was too limited to produce meaningful results." We are at a complete loss to understand how an 83% response of a 70% population sample does not represent a sound basis for a quality statistical analysis.

2. Again, using the same rationale Cohen et al. excluded individual groups of specialists such as oral surgeons, pedodontists, periodontists etc. This was evidently the same group of study respondents that Brodsky et al. stated had no exposure to mercury, representing less than 10% of those questioned. However, Brodsky did not eliminate this group from the study as Cohen et al. had, instead, they were placed in the "low exposure" group for statistical purposes.

3. Brodsky et al. did not use a protocol that compared results of their study to a control population. The reason given "The lack of numbers prevented establishment of a pure control group without any mercury exposure." It would seem that the authors chose to ignore the rather substantial control population that was part of the study and from whom they had received and validated responses stating they had no exposure to mercury in their professional specialty. Even 10% of 42,836 respondents totals more than 4,000 subjects as controls. At the very least, the two groups could have been compared to established results from the general population, which are readily obtainable.

4. Although exposure to mercury was originally included in the adjustment rates utilized by Cohen et al., they were subsequently excluded because "they did not significantly influence the results." We wouldn't have questioned that statement except that in their results the authors discuss some of the factors that might represent interfering variables that might confound subsequent health comparisons and make the following statement "In fact, significant differences in these factors are present between users and nonusers of anesthetics. For example, users of anesthetics tend to be younger and also to have greater exposure to amalgam restorations than do the nonusers." It would appear from that statement that their statistical category of "heavy user of anesthetics" would also be the group getting more exposure to mercury, i.e. involved in placing more than 40 amalgams per week.

In their discussion of spontaneous abortion the authors evidently forgot the relationship between anesthetic use and mercury exposure because they state that although there was a 50% increase in the incidence of spontaneous abortion among the wives of male dentists heavily exposed to inhalation anesthetics during the year prior to conception, no such increase in rates of spontaneous abortion were observed among the wives of male anesthetists working in operating rooms. The authors felt there was no obvious explanation for this difference. We would like to suggest that a plausible explanation for the difference might be that hospital operating room anesthetists are not exposed to mercury! Moreover, their is valid scientific data confirming the transport of mercury, trapped in clothing and shoes, from workplace to home, with subsequent contamination of the home. This can be avoided only by changing into uncontaminated clothing prior to leaving the workplace. Consequently, the wives of dental personnel could be exposed to mercury without ever suspecting such contamination existed.

The authors also performed a separate analysis of the incidence of spontaneous abortion in female chairside assistants in relation to specific exposure to nitrous oxide. They concluded "Women exposed solely to nitrous oxide show a doubling in the rate of spontaneous abortion compared with women not exposed to this specific inhalation anesthetic. Again, we would have to assume from the previous statements, that those chairside assistants getting exposure to nitrous oxide were also involved in placing amalgams and were, in fact, also getting chronic exposure to mercury vapor."
This same aspect underlies some of the other conclusions of the Cohen et al. study in that references to nitrous oxide use relate to previous studies utilizing oral surgeons, who also do not have exposure to mercury.

5. The original questionnaire used by Cohen et al., upon which the Brodsky et al. study and conclusions are based asked only one question (#3) regarding the use of amalgams. Question number 3 asked "Approximately how many amalgams do you place in a typical week? none____ <40____ 40+____." Although the Cohen et al. study was investigating occupational disease in dentistry related to exposure to anesthetic gases, the authors considered exposure to mercury might be a variable or factor. This fact notwithstanding, the definition of the two exposure groups was clearly haphazard and arbitrary. No data was provided on the actual exposures other than more or less than 40 amalgams placed per week. The two groups may well have averaged placing 39 and 40 amalgams per week, hardly a valid comparison.

6. The validity of personal recall, judgement, and response by questionnaire might also be questioned. Even the authors stated "Thus, responder bias cannot be ruled out, and even may be present in the responding group itself because of a desire to present or conceal data for personal or professional reasons of which we are unaware."

7. The investigated parameters for congenital abnormalities are singularly devoid of any that have been scientifically attributed to prenatal exposure to mercury. The questionnaire on page 24 of the Cohen et al. report (4) lists the abnormalities considered, all of which are structural defects not previously related to prenatal mercury exposure, which has been clearly established to cause defects of the central nervous system. Of great interest is part 10 of that questionnaire, which asks "Please indicate any other serious health problems for each child (ie, cerebral palsy, cancer, mental retardation, epilepsy, etc.)." All of these except cancer have been scientifically attributed to mercury exposure. The authors have an opportunity to provide an invaluable service to the public by investigating the relationship of the mercury exposure to the items in part 10 of their questionnaire.

The Brodsky et al report is not the only investigation of the effects of exposure to mercury vapor on pregnancy outcome. The United States Environmental Protection Agency states that "women chronically exposed to mercury vapor experienced increased frequencies of menstrual disturbances and spontaneous abortions; also, a high mortality rate was observed among infants born to women who displayed symptoms of mercury poisoning". (5)

In 1967, an epidemiologic survey was conducted in Lithuania on women working in dental offices where mercury vapor concentrations were lower than 0.08 milligrams per cubic meter. The women experienced an increased incidence of spontaneous abortion and breast pathology that was related to the length of time on the job. (6)

In 1981, the International Conference on Mercury Hazards in Dental Practice was held in Glasgow, Scotland. One of the papers presented was entitled "Pregnancy In Female Dentists - A Mercury Hazard?" by H. Gordon. (7) The reported findings were:

Female dentists had a higher rate of spontaneous abortions than a control group of female medical personnel. This increase was especially evident in first pregnancies. The abortion rate in the female dentists was also higher than large population studies reported from Aberdeen, New York, and two large series of private patients in the United States. The perinatal mortality rate for the dentists was also higher than normal.

The author stated that "it does therefore seem that female dentists who work have a higher than expected incidence of spontaneous abortion and premature labor and perhaps a high perinatal mortality".
In a 1987 study, eighty-one women (45 dentists and 36 dental assistants) participated in a study regarding reproductive hazards in occupational exposure to metallic mercury. The total mercury levels in the hair of the exposed women exceeded significantly those determined in the hair of 34 controls not exposed to mercury. There was a significant, positive association between total mercury levels in the hair of exposed women and the occurrence of reproductive failures in their histories. There was also a statistically significant relationship between hair mercury levels and menstrual cycle disorders.(8)

Although it has been well established that the primary effect of exposure to mercury vapor is on the central nervous system, very little investigation has been directed to these effects on dental personnel. In 1980, Symington and associates reported on two dentists who were diagnosed as having mercury poisoning with the classic subjective signs and symptoms.(9) The operatory mercury vapor measurements were 0.005 milligrams per cubic meter in one office and 0.002 and 0.008 milligrams per cubic meter in the other, well below established standards for workroom exposures. The authors stated: "The insidious nature of the onset of chronic mercury poisoning leads to diagnostic difficulties and the clinical overlap with features of psychological stress and early alcoholism is apparent. The precise stage at which dental workers are vulnerable to mercury absorption is not yet identified. It seems probable that non-specific ill health related to mercury overload is passing unrecognized."

More recently, researchers at the University of Pennsylvania have determined alterations in nerve conduction velocity in dentists who exhibit mercury contamination in superficial tissues.(10) Of perhaps great significance, recent investigations at the Karolinska Institute in Stockholm have revealed extremely high levels of mercury in the pituitary glands of deceased dentists. (11)

The significance of these newer revelations should not, and cannot, be ignored. Enough evidence has now been compiled to indicate that a problem of a potentially serious nature has been overlooked. The health of dental professionals should not be considered to be trivial or inconsequential and should not be relegated to decision by unsubstantiated opinion or contrived reports. The dental scientific community has an obligation to immediately initiate valid studies investigating the health status of dental personnel in parameters known to be influenced by exposure to mercury vapor; namely, the nervous system, the endocrine system, the immune system, and potential effects on the outcome of pregnancy.

REFERENCES


***************

ABSTRACTS/REVIEWS


ABSTRACT: The chelation of mercury by 2,3-dimercaptopropane-1-sulfonate (DMPS) and its usefulness in the estimation of mercury burdens was investigated by exposing male, Sprague-Dawley rats to $^{203}$HgCl$_2$ (0.1-2 mg of Hg per kg i.p.) or $^{203}$Hg vapor (0.5-2.0 mg of Hg per m$^3$). DMPS (0.2-2.0 mmol/kg) was injected i.p. at time ranging from 1 to 38 days after exposure to the mercurial. Urine and feces were collected for 24 hr before and after DMPS treatment. Whole body mercury levels, tissue levels and excretion of mercury were measured by radioactivity counting. After DMPS treatment there was a significant decrease of whole body mercury levels and an increase in urinary excretion. The increase in urinary excretion was directly proportional to the whole body burden of mercury at the time of dosing with DMPS in animals dosed with HgCl$_2$ and exposed to mercury vapor. Furthermore, the increase in urinary excretion induced by DMPS was almost equal to the amount of mercury lost from the kidneys.

*************


ABSTRACT: During the last decade dental amalgam’s role as an internal potential mercury source has been subject of countless discussions. A large number of studies however indicate that mercury release from dental amalgam is substantially larger than previously estimated. Many patients suffering from the Metal Syndrome have observed a relationship in time between odontological treatment and occurrence or increasing of their symptoms. In the light of those observations this study was intended to investigate if there was and differences in the elemental profiles of blood from amalgam bearers, the patient group, and humans who never have had any dental amalgams.

The patients selected for this study were suffering from the metal syndrome, according to the criteria of Ahlrot-Westerlund et al., a sex and age matched control group and a selected group, who never had any dental treatment. To determine the presence and the concentration of different elements (the elemental profile) in blood-plasma and individual blood-cells have been used EDXRF (Kevex 0600 Ultra Trace System) and micro-PIXE described elsewhere. NBS and IAEA reference samples have been used to validate the accuracy of both methods in comparison to AA and NAA technologies.

Clear deviations both in the total elemental profiles as well as in distribution of heavy metals and essential elements among the blood cells were found. The most conspicuous finding was skew distributions of mercury and strontium in the patient group compared to the two other groups. Differences were also found between group 2 and 3.

ABSTRACT: Urinary mercury levels (HgU) have been measured in the first morning urine samples from 505 dental personnel in the county of Västerbotten in northern Sweden, and from 41 controls, randomly selected wives and husbands to the examined dentists. Information concerning personal factors and working routines were gathered from questionnaires.

The HgU values were higher for dental personnel than for the control group but were consistently very low and were for all examined subjects below the proposed occupational exposure limit for HgU for subjects exposed to mercury vapor (28 nmol/mmol creatinine). Dental nurses had the highest HgU values, higher in Private Dental Care than in Public Dental Care.

The levels of mercury vapor in the workroom air influenced the HgU in a statistically significant way only for male dentists in Public Dental Care. Symptoms which might be caused by exposure to mercury were more common among dental personnel than in the control group., but no statistically significant correlations could be found with HgU values.

There was a statistically significant correlation between the number of amalgam surfaces and the HgU values in the control group.

NOTE: The authors felt that because of the contradictory results concerning correlations between exposure to low mercury levels and signs and symptoms that they should conduct further investigations of the blood and urine of the subjects in this study who had higher urinary mercury excretion than their own peer group. The following abstract reflects results of the additional investigation.

***************


ABSTRACT: The aims were to measure the mercury levels in morning urine, 24-h urine, blood and ambient air in a group of dental personnel with the highest urinary mercury levels (HgU) in a previous study; to investigate other possible exposition to mercury than the professional and to compare the findings with those in a group with low HgU in the previous study.

The material comprised 31 dental personnel; 16 women and 2 men with HgU exceeding 5 nmol/mmol creatinine in the previous study and another group, 11 women and 2 men with HgU ≤3 nmol/mmol creatinine. The four men were dentists, one female subject was a sterilizing room assistant and the remaining 26 subjects were assistant dental nurses.

The subjects answered questionnaires concerning health and environmental factors, amalgam surfaces were registered, urine and blood samples were collected and analyses with AAS and NAA and for 11 subjects the mercury vapor levels in the breathing zone (TWA) were also measured.

The HgU in morning urine samples in the present study were in good accordance with the HgU in the previous study (Spearman rank correlation test: r = 0.86; p.001) and also with HgU in 24-h samples in the present study (r = 0.97; p.001). The correlation coefficient between HgU and the mercury levels in blood (HgB) was r = 0.69; (p.001). No significant correlations were found between TWA exposures and HgU or HgB. The only factor studied which significantly influenced the HgU and HgB was the amalgam surfaces of the subjects (r = 0.56; p.01 and r = 0.63; p.001 respectively).

Amalgam fillings of the subjects seem to significantly influence the HgU and HgB in dental personnel with low occupational exposure to mercury vapor.
BIO-PROBE COMMENT: The Nilsson’s have produced very significant data that refutes the ADA and NIDR positions that the only thing dental personnel have to be concerned about is proper mercury hygiene in the work environment. It is apparent that even with meticulous attention to mercury hygiene in the office, the dentist and their staffs who have a mouth full of amalgam fillings are going to be at greater risk of experiencing micromercurialism than their peers who have had all their amalgams replaced with non-mercury containing materials. This also corroborates the previous work of Snapp, Svare and Peterson who concluded that “there was a reduction in blood mercury levels when existing dental amalgam restorations were removed and replaced with a nonmercury containing restorative material. (Snapp et al. J Dent Res. Vol 65:311, Mar. 1986).

************************


SUMMARY: Three cases of nickel sensitivity to nickel-containing dental plates are reported. In case 1, a 13-year old girl had been wearing a dental plate at night for bite correction. After the first week of wearing it lips showed inflammation and subsequently cheeks and eyelids became swollen. After giving up the dental plate, all complaints ceased without any therapy. In case 2, a 17-year old girl had been wearing a dental plate for bite correction. After 7-8 days, edema developed on the lips and cheeks. Eyelid edema developed later and was associated with cheilitis. She was symptom free 2 weeks after removal of the dental plate. In case 3, an 18-year old girl had been wearing a dental plate fixed with dental crowns for approximately 3 months when itching, edema and dermatitis developed around the eyes and lips. She became symptom free 7 days after removing the dental plate.

************************


SUMMARY: Seventy-six unexposed industrial workers and 89 chloralkali workers exposed to inorganic mercury were examined. Fish consumption was assessed by questionnaire and a dentist recorded the number of amalgam surfaces of each participant. Blood and urine samples were analyzed for mercury using flameless atomic absorption spectrophotometry.

In the occupationally exposed group the average mercury concentration in blood and urine was four and ten times higher respectively in comparison to the controls.

In the control group there was a significant correlation between blood mercury and the average weekly fish consumption. There was also a significant relationship between the urinary concentration of mercury and the number of amalgam surfaces. This last finding supports previous studies by Nylander et. al. 1987 and Nilsson & Nilsson 1986. It also indicates that mercury released from dental amalgam is subsequently absorbed.

In the mercury exposed group there was no correlation between blood or urine mercury and the amount of fish consumption or the number of amalgam fillings. The authors felt this might possibly be related to their occupational exposure to inorganic mercury.

BIO-PROBE COMMENT: As with other studies of chloralkali workers exposed to mercury, it appears the authors failed to take into consideration the resultant effect on mercury absorption and excretion when chlorine and mercury are present in the same atmosphere being inhaled. See Bio-Probe Newsletter 5(2).

************************

**SUMMARY:** To get an appropriate estimation of the absorbed amount of mercury released from dental amalgam, the authors made parallel measurements of oral and tracheal air-concentrations of mercury in ten individuals with 8-54 amalgam surfaces, (mean = 25) with an abrasive tooth paste. The tracheal measurements were carried out with a catheter connected to a Jerome mercury vapor analyzer (model 411) and put into the lower part of trachea through a bronchoscope. Parallel measurements were performed intra-orally.

The tracheal mercury concentrations were considerably lower than the intra-oral levels. Langworth et al. estimate the average daily mercury absorption from amalgam fillings based on mercury concentration in tracheal air of about 2 ug/m3 during four hours of “stimulated” conditions and a five fold lower concentration during 20 hours of “unstimulated” conditions. The authors conclude that with their data they estimate the daily mercury uptake from amalgam fillings to be about 3 ug.

**BIO-PROBE COMMENT:** Unfortunately, the exact protocol utilized will not be available for evaluation until the complete report is published. However, the findings of this study are at great variance with Vimy & Lorschieder, and all the other studies demonstrating the release of mercury from dental amalgams. If in fact subsequent research, with an adequate statistical sample, validates the methodology utilized, does it really change any of the basic scientific facts? The answer is NO. It doesn’t change the fact that amalgams are releasing mercury. It doesn’t change the fact that mercury is a poison. It doesn’t change the fact that mercury from dental amalgams accumulates in various organs of the body. It doesn’t change the fact that a direct correlation between the number of amalgam surfaces and mercury content of the brain has been established. It doesn’t change the fact that dentists have a higher mercury content in their pituitary glands or that dental personnel had a higher incidence of brain tumors than other medical personnel. It doesn’t change the fact that the oral and nasal mucosa absorbs mercury vapor; nor does it change the results of the Langworth et al. study demonstrating a significant relationship between the urinary concentration of mercury and the number of amalgam surfaces. What it might change is the estimation of the amount of mercury vapor being released from dental amalgam fillings.

***************


**SUMMARY:** The painters Rubens, Renoir, and Dufy suffered from rheumatoid arthritis and Klee from scleroderma. Analysis of the areas of various colors in randomly selected paintings by these four artists and by eight "controls" (contemporary painters without rheumatic disease) suggests that Rubens, Renoir, Dufy, and Klee used significantly more bright and clear colors based on toxic heavy metals and fewer earth colors containing harmless iron and carbon compounds. These four painters may have been heavily exposed to mercury sulphide, cadmium sulphide, arsenic sulphide, lead, antimony, tin, cobalt, manganese, and chromium, the metals of the bright and clear colors, and exposure to these metals may be of importance in the development of inflammatory rheumatic diseases. Artists today are not so exposed, but heavy metal contamination in food and drinking water exists and experience from the occupational exposure of old masters is still relevant.

***************


**ABSTRACT:** Morphofunctional changes in HeLa cell culture following treatment with various concentrations of selenium ion during 2, 4 and 24 hours are described. Variations in mitotic index, duration
of separate mitotic stages and a profile of pathologic mitoses were established. Inhibition of cell entry into the S-phase of mitotic cycle and modifications of RNA and protein synthesis after treatment with 0.1 and 0.25 ppm of the trace element was shown autoradiographically. Increased destruction of cell monolayer following contact with selenium was demonstrated by light, scanning and transmission electron microscopy. It is suggested that selenium exerts a toxic effect on tumor cells although this mechanism is not yet clear.


**ABSTRACT:** Selenium (Se) deficiency produced up to a 14-fold decrease in hepatic tri-iodothyronine (T3) production from thyroxine (T4) in vitro. T3 is one of the iodine-containing thyroid hormones thought to be produced by the partial deiodination of T4. It has several times the biological activity of T4. The T3 production could not be restored by the addition of a variety of cofactors, nor by the addition of control homogenate. The impairment in hepatic T3 production observed in selenium deficiency was reflected in the concentrations of thyroid hormones circulating in plasma, T4 being increased approximately 40% and T3 being decreased by 30%. However, the fall in plasma T3 concentrations was smaller than might be expected in view of the marked decrease in T3 production. Se deficiency had no measurable effect on plasma reverse-tri-iodothyronine concentrations. The data suggest the Se deficiency produces an inhibition of both 5- and 5'-deiodination, consistent with the widely held view that these reactions are catalyzed by the same enzyme complex. The mechanism of inhibition appears not to be mediated by changes in thiol levels, but a direct role of Se in the activity of the deiodinase complex cannot be excluded.

**BIO-PROBE COMMENT:** In relation to the above two abstracts, it is interesting to note the relationship of mercury body burden, dental amalgams' contribution to that body burden, and the potential mercury has to deplete and cause selenium deficiency and to also affect iodine uptake by the thyroid. In a recent Editorial in the Townsend Letter for Doctors (#52) entitled Controversies in thyroid therapy, Dr. Alan Gaby discusses the controversy concerning which thyroid medication should be prescribed and based on his own vast clinical experience in using desiccated thyroid rather than the synthetics brings up the following point:

"Exactly why the natural form works better is not clear. The difference could be due to diiodothyrosine (DIT). As much as 38% of the iodine in thyroid extract is in the form of this compound and DIT is found naturally in the blood. Until recently, DIT was thought to be a breakdown product of thyroid hormones and to have no physiologic significance. However, in a recent study thyroidectomized patients treated with thyroxine had markedly reduced levels of DIT. This study showed that DIT is not a peripheral metabolite, but rather is synthesized by the thyroid gland and released into the circulation."

In relation to Dr. Gaby's findings on the efficacy of the desiccated thyroid it would be of extreme interest to see how many of his patients had a mouth full of amalgam fillings.


**ABSTRACT:** The association between serum alpha-tocopherol levels and the subsequent incidence of cancer was investigated in a longitudinal study of 21,172 men initially aged 15-99 years in six geographic areas in Finland. The baseline examination was conducted in 1968-1972, and during the follow-up of 6-10 years, 453 cancers were diagnosed. The serum alpha-tocopherol levels were measured from stored serum samples from these men and from 841 male controls, matched for municipality and age, who did not
develop cancer during the follow-up. The mean levels of serum alpha-tocopherol among the cancer cases and controls were 8.02 and 8.28 mg/liter, respectively. A high serum alpha-tocopherol was associated with a reduced risk of cancer. The relative risk of cancer in persons in the two highest (threshold 8.70 mg/liter) quintiles of serum alpha-tocopherol was 0.64 (95 per cent confidence interval = 0.49-0.85) in comparison with those in the three lowest quintiles. The association was strongest for the combined group of cancers unrelated to smoking and varied between subgroups of the study population as well as between different cancers. The association persisted when adjusted for serum cholesterol, serum vitamin A, serum selenium, and various confounding factors. It also persisted when subjects with possible signs of cancer at the time when the blood samples were drawn or with cancers diagnosed during the first two years of follow-up were excluded. These findings agree with the hypothesis that high vitamin E intake protects against cancer.

**BIO-PROBE COMMENT:** Does the fact that mercury affects the nutrure of vitamin E have a bearing on the efficacy of vitamin E supplementation? Are amalgam bearers, with their chronic mercury exposure, more prone to vitamin E deficiency and hence at greater risk of cancer? What about concurrent depressed levels of selenium and vitamin E. The nutrure of both are affected by mercury and both nutrients have been shown epidemiologically to have a bearing on the incidence of cancer!

***************

We would like to quote the following item that appeared in the Orlando Sentinel, Thursday, June 30, 1988, page A-12.

"How could this be? If correct the findings lend support to a school of disease treatment called homeopathy. Its adherents basically say that the same substance that can cause a problem, if diluted into infinitesimal doses, can cure the problem. Conventional medical wisdom is that there’s absolutely no scientific evidence to support claims of the homeopaths. Now researchers at five laboratories around the world have independently confirmed that there is a curious antibody reaction that should be impossible. ‘It breaks all the rules,’ said Patricia Fortner of the University of Toronto. The researchers found that antibodies that react with certain blood cells will continue to react when diluted far beyond the point where they should theoretically be able to. A cautious report will appear today in the British scientific journal Nature."

***************


**ABSTRACT:** High doses of common dietary sugars have been shown by previous investigations to increase urinary excretion of bone mineral. The aim of this study was to quantitate mineral ions, particularly Ca and Mg excreted for 5h following the ingestion of different sugar doses under standardized conditions of fasting and water supply.

Ca excretion above control (water ingestion only) showed great inter-individual variation and could exceed 25 mg after 100 g sucrose or glucose and 12 mg after 25 g sucrose. Mg excretion showed strong positive correlation to that of Ca. F in 1 or 5 mg dosage together with sugar doses showed no significant effect on Ca or Mg excretion.

Since negative Ca balance is common, particularly in menopause and old age, the Ca losses caused by high frequent sugar intakes, may be a serious threat to skeletal health. There are strong indications that the alveolar osteopenia provoked in many rodent experiments by high dietary sugar is causally connected with increased urinary loss of Ca. There are many indications of similar effects on Ca and Mg balances in
diabetic hyperglycemia as by high sugar intake. Two main hypotheses for the mechanisms of these effects have been offered: 1. reduced reabsorption of Ca and Mg in the kidneys; 2. increased bone mineral dissolution by acids formed by osteoclasts and other osteocytes in hyperglycemia. Since over 95% of the body's Ca is contained in the skeleton, excessive Ca loss will be derived from bone. This field of research should thus be a challenge for several disciplines.

***************

CASE HISTORY

10/26/87: This is a 56 year old Catholic priest referred for mercury removal. He had numerous neurological and oral symptoms. He had difficulty concentrating and could no longer study. It was necessary for him to retire from his teaching position due to his declining health. His symptoms include strabismus and indented tongue. He had difficulty protruding his tongue with much trembling. His tongue drew to the left on protruding. His teeth are yellow. He has a double pulse, high triglycerides, bi-lateral inguinal hernias, diverticulitis, dysentery, and obesity. I prescribed Scleron 12c which is Plumbum 12c twice a day.

11/5/87: I completed the mercury removal. Since taking Scleron his tongue is relaxed and he feels better generally. Before Scleron and after mercury removal from his teeth, his ability to concentrate improved.

12/17/87: He reports that now he is able to study and jogs two miles a day.

5/25/88: Doing much better. Back to jogging and has no sluggishness now. Wants more energy and has a positive attitude. (Submitted by a Bio-Probe subscriber)

FORUM

September 16-18, 1988. The International Academy of Oral Medicine & Toxicology (IAOMT) ANNUAL MEETING & SCIENTIFIC SYMPOSIUM @ Oakbrook Hills Hotel & Conference Center, Oakbrook Illinois. Pre registration Dr. Marcia Basciano, 2932 Finley Road, Downers Grove, IL 60515. 312-629-6299. For hotel reservations call 312-850-5555. Mention IAOMT.


The 11th Annual National Dental Seminar in Homeopathy will be held in Chicago, October 21-23, 1988. This is a complete seminar-concept for the dentist by the dentist and about the dentist. The faculty of Drs. Kimbrough, Zunka, Canida and Charnesky will ascertain each participants level of understanding of Homeopathy and help develop a practical & orderly approach to dental problems. Fees: $75-375. Basic & Advanced courses. Reservations 1-800-445-3315. CONTACT: NDS, P.O. Box 123, Marengo, IL 60152

The American Academy and Board of Head, Facial and Neck Pain and TMJ Orthopedics announces their fourth annual International Symposium on Clinical Management of Head, Facial and Neck Pain & TMJ Disorders. August 19-21, 1988 at the Stouffer Harborside Hotel, Baltimore, Maryland. For information about membership in the Academy or attending call 1-800-333-TMJ1

International Conference on Biocompatibility of Materials sponsored by University of Colorado at Colorado Springs and T.E.R.F. The conference is scheduled from Saturday, November 5th through Thursday, November 10th, 1988. It promises to be an outstanding program featuring International Lecturers from Czechoslovakia, Australia, France, New Zealand, Sweden and the U.S. For more information call 1-800-331-2303

NOTE: Notices to appear in the FORUM should be submitted in writing. No phone calls please!