Immune Reactive Conditions: The Mercury Connection to Eczema, Psoriasis, Lupus, Asthma, Scleroderma, Rheumatoid Arthritis, and Allergies

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1.1 Introduction

This paper documents that a significant percentage of people are allergic or immune reactive to mercury to varying degrees, and that millions are adversely affected by such conditions, including many disabled by related autoimmune conditions. The incidence of allergic and immune reactive conditions such as allergies, asthma, eczema, lupus, psoriasis, MS, etc. have been increasing rapidly in recent years (1-3, 21, 23).

Autism incidence rate had a 10 fold increase in the last decade and ADHD had major increases likewise (16, 116). At least 50 million have allergies (19%)(1d) and according to the U.S. CDC (1c) approximately 20 million have asthma (7.7%). The largest increase has been in infants (1, 2, 6, 7, 21, 23, 16), and approximately 10% of infants-approximately 15 million in the U.S. with systemic eczema (1ab, 9, 16). Studies researching the reason for these rapid increases in infant reactive conditions seem to implicate earlier and higher usage of vaccines containing mercury (thimerasol) as a likely connection (2, 6, 21, 23, 16), plus fetal and neonatal exposure from mother's blood and milk (115). It has been estimated that by age 3 the typical child has received over 235 micrograms of mercury thimerasol from vaccinations which is considerably more than Federal mercury safety guidelines, in addition to significant levels of mercury exposure from other sources for many (2, 21, 23, 16). Infants during this period have undeveloped immune systems and blood brain barriers, and much of the mercury goes to the brain, resulting in significant adverse neurological effects in those that are most susceptible. Many thousands of parents have reported that their child got such conditions after vaccination, and tests have confirmed high levels of mercury in many of those tested, along with other toxic exposures. Many of those diagnosed with high mercury levels have also been found to have significant improvement after mercury detoxification (16, 23, 11, 12, etc.). Thimerasol

had been previously removed from similar preservative uses in eye drops and eye medications after evidence of a connection to chronic degenerative eye conditions. After over 15,000 law suits were filed in France over adverse effects of the Hepatitis B vaccine, the French Minister of Health ended the mandatory hepatitis B vaccination program for all school children. Adverse effects included neurological disorders and autoimmune disorders such as multiple sclerosis and lupus.

People with chronic and immune reactive problems are increasingly finding dental materials are a factor in their problems (159, etc.) and getting biocompatibility tests run to test their immune reactivity to the various dental materials used. Of all patients tested in a German medical lab (12e), approximately 11% were found to have significant mercury allergy, and most of these had significant health improvement after amalgam replacement. A high percentage of such patients test immune reactive to mercury and some of the other toxic metals. Of the many thousands who have had the Clifford immune reactivity test and the similar Peak Lab test, over 90% tested immune reactive to mercury and often to other metals as well (46). The extreme immunotoxicity of mercury and resulting damage to immune system cells and the immune system by mercury exposure is likely a factor in this. MELISA is an immune reactivity test developed to measure "significant" immune reactivity to substances to the degree that often results in autoimmune reactions and autoimmune conditions like CFS, Fibromyalgia, oral lichen planus, MS, rheumatoid arthritis, lupus, etc. Of a population of over 3000 with chronic health problems tested by the immune lymphocyte reactivity test (MELISA, 12a), 20% tested positive for inorganic mercury, 13% for phenyl mercury, 8% for methyl mercury, and 7% for mercury thimerasol. For people with autoimmune conditions such as CFS, Fibromyalgia, or Multiple Chemical Sensitivity, the percentage testing immune reactive to mercury was much higher- 28% percent were immune reactive to palladium, 26% to gold, 23% to inorganic mercury, 23% to phenyl mercury, and 12% to methyl mercury, as compared to less than 5% for controls. Of 98 patients who had amalgam fillings replaced, 76% had long term health improvement and significant improvement in MELISA scores. Other clinics have reported similar results (39-43, 159, etc.).

1.2 Allergic health effects related to mercury exposure

Many studies including hundreds of thousands of clinical cases as well as Scientific Panels have found that the number one source of mercury in adults is mercury amalgam fillings and exposures to those with amalgam commonly exceed government health guidelines for mercury (199, 134). Amalgam has also been found to be the largest source of methyl mercury in most who have amalgam fillings (134, 199). Amalgam fillings of mothers is also a significant source of exposure to infants as mercury in the mother crosses the placenta in levels higher than in the mother and significant exposure also occurs through breast milk (115).

Studies have found mercury to be a major factor in allergic/immune reactive conditions including lupus (27-32, 46d, 47, 88, 159), contact dermatitis (3-10, 91, 159), eczema (3-9, 18-20, 34, 31), psoriasis (33-38, 54, 31, 11), oral lichen planus (11, 39-42, 159), systemic eczematous contact-type dermatitis (baboon syndrome)(7), stomatitis (10b, 54, 159), scleroderma (47, 87), allergies (11-15, 31, 43-49), asthma (47-51, 65, 16), autoimmune renal effects (26b), and rheumatoid arthritis (47, 49, 88). Mercury has been found to accumulate in connective tissue, resulting in lupus or scleroderma (157, 159). Mercury has been shown to be a factor that can cause rheumatoid arthritis by activating localized CD4+ T-cells which trigger production of immune macrophages and immunoglobulin (Ig) producing cells in joints (12, 513, 514).

Allergic contact eczema is the most frequent occupational disease (1, 91), occurring in over 10% of children in some areas; and the most common cause of contact eczema is exposure to toxic metals (1, 5-9). The metals most commonly causing allergic immune reactivity are nickel, mercury, chromium, cobalt, and palladium (5-15, 60, 91, 159, 200). Nickel in stainless steel braces and crowns is a source of reactivity and autoimmunity along with gold and palladium in crowns (32bc, 11, 12) The highest

level of sensitization is to Infants, who are most reactive to thimerosal, a form of mercury that has been used as a preservative in vaccines and eye drops (6, 5b, 16). There is strong suggestive and clinical evidence for a connection between toxic metals and autism (16, 21, 2, 23-25, 81, 86). Although nickel has historically been the number one source of metal allergy and contact allergy, with many dozens of medical studies documenting the connection to conditions such as contact eczema, in recent years the largest increase in infant reactivity appears to be related to mercury exposure (6, 7, 32, 86, 16). Also mercury has been found to be the most significant factor in large numbers of reactive autoimmune allergic and neurological conditions (11-15, 201) Thus in assessing mechanisms by which these conditions are related to metals, this paper will focus more on mercury. Some of this would be similar for other metals however.

Mercury causes release of inflammatory cytokines such as Tumor Necrosis Factor-alpha (TNFa) and Interleukin-4 which are documented to be factors in the chronic inflammatory conditions discussed here, including asthma, lupus, rheumatoid arthritis, scleroderma, celiac and chron's disease, etc. (47, 49, 65, 87-92) and also is involved in chronic heart problems. TNFa (tumor necrosis factor-alpha) is a cytokine that controls a wide range of immune cell response in mammals, including cell death (apoptosis). This process is involved in inflammatory and degenerative neurological conditions like ALS, MS, Parkinson's, rheumatoid arthritis, etc. Cell signaling mechanisms like sphingolipids are part of the control mechanism for the TNFa apoptosis mechanism (101a). Gluthathione is an amino acid that is a normal cellular mechanism for controlling apoptosis. When glutathione is depleted in the brain, reactive oxidative species increased, and CNS and cell signaling mechanisms are disrupted by toxic exposures such as mercury, neuronal cell apoptosis results and neurological damage. Mercury has been shown to induce TNFa, deplete glutathione, and increase glutamate, dopamine, and calcium related toxicity, causing inflammatory effects and cellular apoptosis in neuronal and immune cells (101b, 101c).

Na (+), K (+)-ATPase is a transmembrane protein that transports sodium and potassium ions across cell membranes during an activity cycle that uses the energy released by ATP hydrolysis. Mercury is documented to inhibit Na (+), K (+)-ATPase function at very low levels of exposure (94). Studies have found that in asthma, lupus, rheumatoid arthritis, scleroderma, celiac/chron's/IBS, and eczema cases there was a reduction in serum magnesium and RBC membrane Na (+)-K+ ATPase activity and an elevation in plasma serum digoxin (87-90, 65). The activity of some free-radical scavenging enzymes, concentration of glutathione decreased significantly, while the concentration of serum lipid peroxidation products and nitric oxide increased. The inhibition of Na+-K+ ATPase can contribute to increase in intracellular calcium and decrease in magnesium, which can result in 1) defective neurotransmitter transport mechanism, 2) neuronal degeneration and apoptosis, 3) mitochondrial dysfunction, 4) defective golgi body function and protein processing dysfunction. It is documented that mercury is a cause of most of these conditions (30, 29, 65, 87-90, 95, 96, etc.)

Dental staff have been found to have significantly higher prevalence of eye problems, conjunctivitis, atopic dermatitis, and contact urticaria (91c). Finnish dental staff have the highest occupational risk of contact dermatitis with 71% affected over time (91b) with plastics, rubber, and mercury the most common causes of sensitization. Korean dental technicians have a high incidence of contact dermatitis, with dental metals the most common sensitizers. Over 25% had contact dermatitis with over 10% sensitive to 5 metals, chromium, mercury, nickel, cobalt, and palladium (91a). 16.3% were immune reactive to mercury.

One mechanism of mercury's affect on contact sensitivities is the inhibition of glutathione S-transferase (92), which is a modulator of inflammation. Mercury also causes intestinal damage and leaky gut, causing metabolic damage and increasing food sensitivities (93, 157, 84).

A direct mechanism involving mercury's inhibition of cellular enzymatic processes by binding with the hydroxyl radical (SH) in amino acids appears to be a major part of the connection to these allergic/immune reactive conditions (13, 15, 16, 23-31, 56-58). For example mercury has

been found to strongly inhibit the activity of dipeptyl peptidase (DPP IV) which is required in the digestion of the milk protein casein (25, 26a, 16). Studies involving a large sample of autistic and schizophrenic patients found that over 90% of those tested had high levels of the milk protein beta-casamorphin-7 in their blood and urine and defective enzymatic processes for digesting milk protein (24). Casamorphin is a morphine like compound that results in neural disfunction. Elimination of milk products from the diet has been found to improve the condition. As noted previously, such populations have also been found to have high levels of mercury and to recover after mercury detox (23, 11, 12, 16). As mercury levels are reduced the protein binding is reduced and improvement in the enzymatic process occurs (16, 200). Additional cellular level enzymatic effects of mercury's binding with proteins include blockage of sulfur oxidation processes, enzymatic processes involving vitamins B6 and B12, effects on the cytochrome-C energy processes, along with mercury's adverse effects on cellular mineral levels of calcium, magnesium, zinc, and lithium (16, 200). And along with these blockages of cellular enzymatic processes, mercury has been found to cause additional neurological and immune system effects in many through immune/autoimmune reactions (11-15, 201). But the effect on the immune system of exposure to various toxic substances such as toxic metals and environmental pollutants has also been found to have additive or *synergistic effects*[1] and to be a factor in increasing eczema, allergies, asthma, and sensitivity to other lesser allergens. Many of the immune reactive children tested for toxic exposures have found high or reactive levels of other toxic metals, and organochlorine compounds (11, 12, 4). Other than the organochlorines or toxic metals which are discussed later, four common pollutants that have been documented to have effects on such conditions are traffic and industrial pollutants nitrogen oxide, sulfur dioxide, power plant residual oil fly ash, and organochlorine pollutants (4).

Mercury vapor exposure at very low levels adversely affects the immune system (11-15, 44-46, 56-62, 157, 159). From animal studies it has been determined that mercury damages T-cells by generating reactive oxygen species (ROS), depleting the thiol reserves of cells, damaging and decreasing the dimension of mitochondria, causing destruction of cytoplasmic organelles with loss of cell membrane integrity, inhibiting ability to secrete interleukin IL-1 and IL-2R, causing activation of glial cells to produce superoxide and nitric oxide, and inactivating or inhibiting enzyme systems involving the sulphydryl protein groups (13-6, 45, 57, 200). Mercury caused adverse effects on both neutrophil and macrophage function and after depletion of thiol reserves, T-cells were susceptible to Hg induced cellular death (apoptosis)(15, 63, 64). Interferon syntheses was reduced in a concentration dependent manner with either mercury or methyl mercury as well as other immune functions (13-15, 200), and low doses also induce aggregation of cell surface proteins and dramatic tyrosine phosporlation of cellular proteins related to asthma (49-51) and allergic diseases such as eczema and lupus (27-38, 201), and autoimmunity (11-15, 56-58). One study found that insertion of amalgam fillings or nickel dental materials causes a suppression of the number of T-lymphocytes (60), and impairs the T-4/T-8 ratio. Low T4/T8 ratio has been found to be a factor in lupus, anemia, MS, eczema, inflammatory bowel disease, and glomerulonephritis. Mercury induced autoimmunity in animals and humans has been found to be associated with mercury's expression of major histocompatibility complex (MHC) class II genes (56, 14, 15, 57c). Both mercuric and methyl mercury chlorides caused dose dependent reduction in immune B-cell production (59). B-cell expression of IgE receptors were significantly reduced (59), with a rapid and sustained elevation in intracellular levels of calcium induced (59, 65). Antigen specific LST-test was performed on a large number of patients with atopic eczema (33), using T-cells of peripheral blood. 87% showed LST positive reactions to Hg, 87% to Ni, 38% to Au and 40% to Pd They removed LST positive dental metals from the oral cavities of patients. Improvement of symptoms was obtained in 82% (160, 196) of the patients within 1-10 months. Similar results have been obtained at other clinics (11, 34-38).

Mercury and toxic substances effects on suppressing the immune system also are documented to cause increased susceptibility to other pathogens such as viruses, mycoplasma, bacterial infections,

[1] **Internet:** "http://www.flcv.com/synergis.html".

and parasites (157, 98-100). The majority of those with autoimmune conditions like ALS, CFS, FMS, MS have been found to also be infected with mycoplasma and other pathogens. Clinical experience by physicians treating people with chronic conditions has found that the pathogens generally cannot be eliminated without detoxification of mercury and toxic metals (157, etc.)

Many studies have found that the body's basic building blocks, amino acids with SH hydroxyl radicals form strong bonds with the toxic metals such as mercury, resulting in compounds which the immune system recognizes as "foreign" or non-functional in the basic digestive enzymatic processes that use them as fuel and building blocks in cell structure. This results in activation of the immune system, and when there is a chronic exposure can lead to an autoimmune process that results in significant symptoms and various autoimmune diseases and conditions such as these systemic allergic conditions as well as others such as chronic fatigue (CFS), multiple chemical sensitivities (MCS), and fibromyalgia (11-15, 84, 157, 201).

As previously noted, many occupational and children's studies have found mercury and other toxic metals to be a common cause of immune reactivity and contact and systemic skin conditions including eczema (4-12, 31-38). One of the confusions about mercury is that there are several forms of mercury, with different mechanisms of exposure for the different forms, as well as different mechanisms in which the forms of mercury affect the body and immune system. However all have been documented to be extremely neurotoxic and immunotoxic, and to cause autoimmunity in susceptible individuals. Many studies including patch tests and immune reactivity tests have been carried out to assess the level of mercury sensitivity in different populations. They have found that there is a significant portion of the population that are reactive and sensitive to mercury and such have significant effects. In a group of medical students tested by patch test, 12.8% were sensitive to mercury (17). The mercury sensitized students were found to have more than average number of amalgam fillings, higher urine mercury than non-sensitized students, and more allergic reactions to other things such as cosmetics, soaps, shampoos, etc. Many other studies have found similar levels of sensitization in recent years, with those populations with higher exposures such as those with many fillings or dental staff tending to have higher levels of sensitization (11, 12, 200) and more adverse health effects. In a group of 8 with contact eczema patch tested for mercury in Spain, all were positive for mercurochrome, six to inorganic mercury, and some to thimerosal (18). This study like several others noted the danger in patch tests for mercury as 2 of the patients suffered anaphylactic shock after the patch test due to the extreme immune reactivity of some to mercury. Patch tests have also been found to not be a reliable test of mercury or toxic metal sensitivity, since most studies find many with negative patch tests recover from chronic conditions such as OLP (303, etc.) Inorganic mercury was found to be a cause of systemic eczema and digestive problems by a Japanese study (19). There is consensus among researchers and dental authorities that amalgam fillings is the main cause of oral lichen planus (OLP) and the condition is usually cured by amalgam removal (39-42, 54).

Mercury blocks the immune function of magnesium and zinc (125-128), whose deficiencies are known to cause significant neurological effects (129-131). The low Zn levels result in deficient CuZn-Superoxide dismustase (CuZnSOD), which in turn leads to increased levels of superoxide due to toxic metal exposure.

1.3 Autoimmunity caused by Mercury: Connection to Immune and Neurological Conditions

Mercury has been documented to cause autoimmune disease (139, 140, 159, 118, 60, 82, 141, 11, 12) and many researchers have concluded that autoimmunity is a factor in the major chronic neurological diseases such as MS, ALS, PD, SLE, RA, etc. Mercury and other toxic metals also form inorganic compounds with OH, NH2, CL, in addition to the SH radical and thus inhibits many cellular enzyme processes, coenzymes, hormones, and blood cells (12b, 200). Mercury has been found to

impair conversion of thyroid T4 hormone to the active T3 form as well as causing autoimmune thyroiditis common to such patients (140, 142, 156, 157, 12). In general, immune activation from toxic metals such as mercury resulting in cytokine release and abnormalities of the hypothalamus-pituitary-adrenal (HPA) axis can cause changes in the brain, fatigue, and severe psychological symptoms (12, 140, 143, 144-147, 156, 157, 12b, 118) such as profound fatigue, muscosketal pain, sleep disturbances, gastrointestinal and neurological problems as are seen in CFS, fibromyalgia, and autoimmune thyroiditis. Such hypersensitivity has been found most common in those with genetic predisposition to heavy metal sensitivity (11, 12, 142, 157), such as found more frequently in patients with human lymphocyte antigens (HLA-DRA) (142, 146, 147, 12). A significant portions of the population appear to fall in this category. Mercury accumulation in areas of sensory ganglia and the Autonomic Nervous System has been found to commonly be a cause of such pain and fatigue (157).

The enzymatic processes blocked by such toxic substances as mercury also result in chronic formation of metal-protein compounds (HLA antigens or antigen-presenting macrophages) that the body's immune system (T-lymphocytes) does not recognize, resulting in autoimmune reactions (103, 12a, 12b). The metals bind to SH-groups on proteins which can then be recognized as "foreign" and attacked by immune lymphocytes. Such has been extensively documented by studies such as the documentation of the autoimmune function test MELISA, a sophisticated immune/autoimmune test which was developed to test for such reactions (11, 12b).

Very low doses and short term exposures of inorganic Hg (20-200 μg/kg) exacerbates lupus and accelerates mortality in mice. Low dose Hg exposure increases the severity and prevalence of experimental autoimmune myocarditis induced by other factors. In a study of small-scale gold mining using mercury, there was a positive interaction between Hg autoimmunity and malaria. These results suggest a new model for Hg immunotoxicity, as a co-factor in autoimmune disease, increasing the risks and severity of clinical disease in the presence of other triggering events, either genetic or acquired (28e).

Autoimmune reactions to inorganic and methyl mercury have been found to be relatively independent, occurring in over 10% of controls. Among a population of patients being tested for autoimmune problems, 94% of such patients had significant immune reactions to inorganic mercury (MELISA test, 11, 12a, 12b) and 72% had immune reactions to low concentrations of HgCl2 (¡0.5 μg/ml). Of a population of 86 patients with CFS symptoms who had amalgam fillings replaced, 78% reported significant health improvement in a relatively short time period after replacement, and MELISA test scores had a significant reduction in lymphocyte reactivity compared to pre-replacement (12). The MELISA test has proved successful in diagnosing and treating environmentally caused autoimmune diseases such as MS, SLE, oral lichen planus, CFS, etc. (11, 12, 148). A high percentage of patients subjectively diagnosed with CNS and systemic symptoms suggestive of mercury intoxication have been found to have immune reactivity to inorganic mercury (MELISA test, 148), and likewise for MRI positive patients for brain damage. Controls without CNS problems did not have such positive correlations. Nickel, palladium, and gold have also been found to induce autoimmunity in genetically predisposed or highly exposed individuals (11, 12, 13, 149). Tests have found a significant portion of people (over 10%) to be in this category and thus more affected by exposure to amalgam than others. Once compromised by a toxic substance that depletes the immune protectors and causes autoimmunity, the immune system is more susceptible to being sensitized to other toxic chemicals, a factor in multiple chemical sensitivity (MCS). Mercury also causes a reduction in thyroid production (150) and an accumulation in the thyroid of radiation. Among those with chronic immune system problems with related immune antibodies, the types showing the highest level of antibody reductions after amalgam removal include glomerular basal membrane, thyroglobulin, and microsomal thyroid antigens (140, 142, 12).

Toxic metals appear to be only one of the factors involved in chronic autoimmune conditions and appear to often be cofactors with other triggering effects (28e). Very low doses and short term exposures of inorganic Hg (20-200 mug/kg) exacerbates lupus and accelerates mortality in

mice. Low dose Hg exposure increases the severity and prevalence of experimental autoimmune myocarditis induced by other factors. In a study of small-scale gold mining using mercury, there was a positive interaction between Hg autoimmunity and malaria. These results suggest a new model for Hg immunotoxicity, as a co-factor in autoimmune disease, increasing the risks and severity of clinical disease in the presence of other triggering events, either genetic or acquired (28e). Pathogens such as viruses, mycoplasma, bacteria and parasites have been found to usually be present and a factor to deal with in treating those with chronic degenerative conditions and weakened immune systems such as MS (97e, 98, 99, 100) and other autoimmune conditions.

Mercury's biochemical damage at the cellular level include DNA damage, inhibition of DNA and RNA synthesis (102-105); induction of free radical formation (12, 95), depletion of cellular glutathione (necessary for detoxification processes) (30de, 106, 101), inhibition of glutathione peroxidase enzyme (95), inhibition of glutamate uptake (108), induces peroxynitrite and lipid peroxidation damage (109), inducement of inflammatory cytokines (101, 111, 14), causes abnormal immune system damage (15, 63, 69, 107, 110); and autoimmunity (12-15, 63, 112, etc.) Some of these effects can also result in *cancer*[2].

Metals like mercury bind to SH-groups (sulphydryl) in sulfur compounds like amino acids and proteins, changing the structure of the compound that it is attached to. This often results in the immune systems T-cells not recognizing them as appropriate nutrients and attacking them (13-15, 112). Such binding and autoimmune damage has been documented in the fat-rich proteins of the myelin sheaths and of collagen (12b), which are affected in MS. Metals by binding to SH radicals in proteins and other such groups can cause autoimmunity by modifying proteins which via T-cells activate B-cells that target the altered proteins inducing autoimmunity as well as causing aberrant MHC II expression on altered target cells (115de, 117). Studies have also found mercury and lead cause autoantibodies to neuronal proteins, neurofilaments, and myelin basic protein (MBP) (118ag, 12, 119, 120, 121). Mercury and cadmium also have been found to interfere with zinc binding to MBP (122b) which affects MS symptoms since zinc stabilizes the association of MBP with brain myelin (122a). MS has also been found to commonly be related to inflammatory activity in the CNS such as that caused by the reactive oxygen species and cytokine generation caused by mercury and other toxic metals (12, 119, 120, 121). Antioxidants like lipoic acid which counteract such free radical activity have been found to alleviate symptoms and decrease demyelization (123, 124). A group of metal exposed MS patients with amalgam fillings were found to have lower levels of red blood cells, hemoglobin, hemocrit, thyroxine, T-cells, and CD8+ suppressor immune cells than a group of MS patients with amalgam replaced, and more exacerbations of MS than those without (80). Immune and autoimmune mechanisms are thus seen to be a major factor in neurotoxicity of metals.

Autoimmunity has also been found to be a factor in chronic degenerative autoimmune conditions such as MS, ALS, etc., with genetic susceptibility a major factor in who is affected. One genetic factor in Hg induced autoimmunity is major histocompatibility complex (MHC) linked. Both immune cell type Th1 and Th2 cytokine responses are involved in autoimmunity (57c). One genetic difference found in animals and humans is cellular retention differences for metals related to the ability to excrete mercury (58). For example it has been found that individuals with genetic blood factor type APOE-4 do not excrete mercury readily and bioaccumulate mercury, resulting in susceptibility to chronic autoimmune conditions such as Alzheimer's, Parkinson's, etc. as early as age 40 (132), whereas those with type APOE-2 readily excrete mercury and are less susceptible (132). Those with type APOE-3 are intermediate to the other 2 types. The incidence of autoimmune conditions has increased to the extent this is now one of the leading causes of death among women (135). Also when a condition has been initiated and exposure levels decline, autoimmune antibodies also decline in animals or humans (136, 28c, 11, 118, 137, 12)

Exposure to mercury results in metalloprotein compounds that have genetic effects, having both

[2]**Informativo:** "Cancer Connection to Mercury, Toxic Metals, and Dental Cavitations".

structural and catalytic effects on gene expression (114). Some of the processes affected by such metalloprotein control of genes include cellular respiration, metabolism, enzymatic processes, metal-specific homeostasis, and adrenal stress response systems. Significant physiological changes occur when metal ion concentrations exceed threshold levels. Such metalloprotein formation also appears to cause a change in antigenicity and autoimmune reactions in significant numbers of people (103, 11, 12a, 12b). Much mercury in saliva and the brain is also organic, the most neurotoxic form (138, 63), since mouth bacteria and other organisms in the body methylate inorganic mercury to organic mercury (134, 133). Dental amalgam has been found to be the largest source of methyl mercury in most with mercury amalgam fillings (134, 199, etc.).

Mucocutaneous lymph node syndrome (Kawasaki syndrome) is an autoimmune disease that manifests as a multisystemic necrotizing medium vessel vasculitis that is largely seen in children under 5 years of age, which affects many organs, including the skin, mucous membranes, *lymph nodes*[3], and *blood vessel*[4] walls, but the most serious effect is on the heart where it can cause severe aneurysmal dilations in untreated children. Medical literature, epidemiological findings, and some case reports have suggested that mercury may play a pathogenic role (158). Several patients with Kawasaki's Disease have presented with elevated urine mercury levels compared to matched controls. Most symptoms and diagnostic criteria which are seen in children with acrodynia, known to be caused by mercury, are similar to those seen in Kawasaki's Disease. Genetic depletion of glutathione S-transferase, a susceptibility marker for Kawasaki's Disease, is known to be also a risk factor for acrodynia and may also increase susceptibility to mercury. Coinciding with the largest increase (1985-1990) of thimerosal (49.6% ethyl mercury) in vaccines, routinely given to infants in the U.S. by 6 months of age (from 75 microgram to 187.5 microgram), the rates of Kawasaki's Disease increased ten times, and, later (1985-1997), by 20 times. Since 1990, 88 cases of patients developing Kawasaki's Disease some days after vaccination have been reported to the Centers of Disease Control (CDC) including 19% manifesting symptoms the same day.

1.4 Recovery from Chronic Immune and Neurological Related Diseases After Amalgam Removal and Mercury Detoxification

Much of the direct chronic exposure to toxic metals for persons with the autoimmune diseases discussed here appears to be from use of metals in dental work. The most common dental metals that have been documented to be causing widespread adverse health effects are mercury, nickel, palladium, gold, and copper. Although chronic exposure clearly is affecting a much larger population, nickel has been found to be a major factor in many cases of MS and lupus, with palladium having very similar effects to nickel.

Many clinics and studies involving thousands of patients have found that patients with allergic reactive conditions such as oral lichen planus, eczema, chronic allergies etc. usually recover or have significant improvements after amalgam replacement. Of a group of 86 patients with CFS symptoms, 78% reported significant health improvements after replacement of amalgam fillings within a relatively short period, and MELISA test found significant reduction in lymphocyte reactivity compared to pre removal tests (11, 12). The improvement in symptoms and lymphocyte reactivity imply that most of the Hg-induced lymphocyte reactivity is allergenic in nature. Patients with other systemic neurological or immune symptoms such as arthritis, myalgia, CFS, MCS, MS, etc. also often recover after amalgam replacement (11, 12, 200).

A large epidemiological study of 35,000 Americans by the National Institute of Health, the nation's principal health statistics agency, found that there was a significant correlation between having a greater than average number of dental amalgam surfaces and having the a chronic condition such

[3]**Internet:** "http://en.wikipedia.org/wiki/Lymph_node".
[4]**Internet:** "http://en.wikipedia.org/wiki/Blood_vessel".

as epilepsy, MS, or migraine headaches. Fewer of those with this condition have zero fillings than those of the general population while significantly more of those with the condition have 17 or more surfaces than in the general population (155)

There are extensive documented cases (many thousands) where removal of amalgam fillings led to cure of serious health problems such as eczema (22, 33, 34, 38, 52-54, 67-69, 11, 12, 156, 159), psoriasis (33-38, 12), asthma (49-52, 68, 72, 98), lupus (12, 27, 32, 33, 68, 70, 71, 31, 156, 157, 159), allergies (31, 32, 43, 48, 51, 49, 52, 53, 66-74, 84, 157), oral lichen planus (39-42), chronic multiple chemical sensitivities (32, 68, 70, 71, 73, 75-77, 84, 154, 157, 11, 12, 31), ALS (51, 99, 154, 31), arthritis (31, 52, 67, 68, 72, 73, 78, 79, 98, 157, 11), MS (52, 67-70, 73, 80-83, 31c, 99, 100, 151-154, 156, 157), CFS (11, 12, 31, 33, 52-54, 66-68, 70, 71, 75, 84, 85, 98, 99, 153, 154, 157), autoimmune thyroiditis (140, 156, 157, 12c), muscular/joint pain/fibromyalgia (11, 12, 31, 53, 68, 69, 72, 84, 85, 98, 99, 151) and over 20 other chronic health conditions (200). Any references not found in this paper can be found in the bigger paper (200), from which much of this paper is excerpted and which contains clinical documentation of over 60,000 cases of recoveries after amalgam replacement. In several of the studies, over 75% of those with MS and having amalgams replaced recovered or had significant improvement (212 (a), (b), (e), 302, 222, *31). Some of the studies reported similar success rates for SLE but with lower number of cases treated.

Clinical studies have found that patch testing is not a good predictor of success of amalgam removal, as a high percentage of those testing negative also recovered from chronic conditions after replacement of fillings (86, 87, 90). Follow up tests for autoimmune reaction to inorganic mercury after amalgam replacement have found that in most patients tested, the immune reaction as well as most symptoms disappear over time (11, 313, 12b, etc.)

1.5 Arthritis

Osteoarthritis is characterized by degeneration of the articular cartilage or synovial membrane and bone next to the cartilage of knees, hips, and spine, or hand). Cracking or thinning of cartilage leads to loss of shock absorption ability and resulting thickening of bone and development of bone spurs, and inflammatory reactions. The result in stiffness and pain.

Rheumatoid arthritis is an autoimmune condition, characterized by chronic inflammation and thickening of the synovial lining and cartilage destruction. The majority with RA have positive rheumatoid factor in serum. (186) Copper deficiency can be a factor in RA and supplementation can be helpful in such circumstances.

Arthritis is chronic inflammation of joints, characterized by high levels in the joints of archidonic acid products, which are metabolized along 2 enzymatic pathways-PGE-2 & LTB4. The destruction of bone and cartilage in both osteoarthritis (OA) and rheumatoid arthritis (RA) is related to pro-inflammatory cytokines such as TNFa, Interleukin-1 and IL6. It has been found that there is an excess of TNFa in both OA and RA, and some treatments attempt to inhibit TNFa. While NSAIDs relieve symptoms they do not alleviate the underlying problems and usually result in more damage to joints in the long run (186). Celebrex and Vioux are COX-2 inhibitors but do not block inflammation and damage through the LTB4 pathway, plus have significant adverse health effects. Embrel is an expensive TNFa blocker, but can also block useful purposes of TNFa such as for fighting infections and does not suppress other inflammatory cytokines. Other natural options are more effective and safer. DHA from fish oil is an effective anti-inflammatory with no adverse effects. For those for whom this is not sufficient, the drug pentoxifylline (PTX) (Trental) is often helpful (186).

As has been seen, toxic metals like mercury cause pro-inflammatory cytokines and inflammation, so reductions in exposure and body burden such as amalgam replacement, avoidance, and detoxification have been found to be effective at reducing such inflammation. Several natural supplements have been

found to be beneficial in reducing arthritis pain and damage by reducing inflammatory cytokines and. Inflammation. These include nettle leaf, SAMe, ginger, glucosamine and chondroitin sulfate, willow bark (pain relief), EFAs, antioxidants, Gamma-Linolenic Acid (GLA), MSM, and curcumin (186). Inflacin is a topically applied compound that has been found to relieve arthritic pains. Nexrutine is a natural anti-inflammatory that inhibits COX-2 and has been found to be helpful, while 5-Loxin (Boswellic Acid) inhibits the 5-LOX pathway. Both can be beneficial in extreme cases.

Food allergens that can increase inflammation include grain gluten, nightshades, corn, dairy products (casein), and red meats. Fish is a preferred protein. Generally vegetarian diets with probiotics are often helpful for arthritis relief (186). Uncooked vegen diets rich in berries, fruits, vegetable, nuts, and seeds often benefit arthritis sufferers.

1.6 Asthma

Asthma is a chronic inflammatory disorder of the airways, characterized by wheezing, shortness of breath, chest tightness, mucus production, etc. At least 7.2% of the adult population has asthma and asthma in children has become much more prevalent. (186) Asthma is closely tied to immune system reactions of the humoral system, as controlled by cell signaling cytokines. Allergic antigens bind to immune mast cells and basophils, and when these come into contact with IgE antibody, a hypersensitivity response of the immune system occurs leading to inflammation and bronchoconstriction.

Current pharmaceutical treatments are bronchodilators or anti-inflammatory compounds. As previously seen, toxic metal exposures increase inflammatory cytokines and inflammation, so reductions in toxic exposures can significantly improve such conditions. Natural supplements that have been found effective in reducing asthma effects include essential fatty acids (DHA, EPA, GLA), curcumin, flavinoids such as silybin, lycopene, pycogenol, quercetin, Ginkgo extracts, licorice (coughs & congestion), Yerba mate, bee pollen (186).

Breastfeeding for at least 6 months and low levels of cereals has been found to be protective against asthma and allergies, Probiotics for the breastfeeding mother has also been found to be a preventive factor. (186) Food allergies often related to asthma include cereal grains. Other foods that produce common allergies are milk, nuts, chocolate, eggs, MSG, aspirin. High intake of red meat and fats also are related to asthma. Anti-inflammatories like vit C, E, and NAC are usually beneficial in asthma prevention. The minerals selenium and magnesium are protective against asthma. (186)

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