

# INTERNATIONAL HEALTH NEWS

William R. Ware, PhD - Editor

NUMBER 245

MARCH 2014

23<sup>rd</sup> YEAR



*It is unlikely that anyone would argue with the statement that it is better to prevent chronic diseases of aging than to be faced with treatments which attempt to halt progression and treat symptoms and mostly fail. So how are we doing in prevention of hypertension, heart disease, stroke, type 2 diabetes, cancer, chronic lung disease and arthritis? A report card can be created by comparing prevalence in 1998 and 2008, based on data published in 2011. In the table below we compare prevalence as a percentage of the US population for either having none of the above chronic diseases (CD) or having four or more of these disorders for individuals over 65 years of age. During this ten-year period health awareness was increasing, new diets were sprouting up like dandelions, low fat and low cholesterol became huge food marketing tools, and prescription drugs such as antihypertensives and statins were being promoted for primary prevention. Furthermore, smoking declined.*

## REPORT CARD ON PRIMARY PREVENTION, 1998-2008

AGE	ZERO CD (%)*		FOUR + CD (%)*	
	1998	2008	1998	2008
ALL ≥ 65	13.1	7.8	11.6	17.4
ALL ≥ 65 MALE	13.6	8.9	11.3	17.5
ALL ≥ 65 FEMALE	12.8	6.9	11.7	17.3
RANGE 65-69	17.0	11.7	9.1	12.7
RANGE 70-74	14.8	7.5	9.8	16.8

\*CD—Chronic diseases. Source: Hung, W. et al. BMC Geriatrics. 2011;11:1-12

*From this report card, it is clear that the percentage of the population in the US free of chronic disease decreased dramatically, i.e. the prevalence of chronic disease increased dramatically, and this was independent of gender and was seen in the total ≥ 65 population as well as in two age groups which represent the traditional initial retirement years and the following half-decade leading up to approximately life expectancy. This continues a trend seen in the 1990s and, if this trend were to continue, it eventually will be hard to find anyone over 65 who does not have a chronic disease. And omitted in this study are mental diseases. The World Health Organization is predicting a 70% increase in cancer over the next 20 years. The elderly having four or more chronic diseases by 2008 was approaching 20% prevalence. This is perhaps the most shocking observation. The data in this table represent bad news for those concerned with healthcare costs, but more importantly, for those who view healthy aging as an important goal. Furthermore, it can be argued that the data cannot be dismissed by citing increased efficiency of diagnoses. Mainstream preventive medicine appears to have failed. We are on our own.*

*The study from which the above table was derived also looked at impairment, including impaired cognition, vision, hearing, mobility, urinary continence and the presence of disabilities which impacted daily living. The good news is that the prevalence of impairment*

and disability did not increase in the decade examined, although because of the increase in the number of individuals in the  $\geq 65$  age group, the absolute numbers increased. Thus not surprisingly, modern medicine appears better at dealing with some of the problems which arise after one has a chronic disease of aging than preventing these diseases in the first place, although earlier diagnosis may be a factor due to some with less severe disease. The authors of the study from which the above data was derived also comment that the main goal of successful aging is the maintenance of independence and they emphasize the stability of the prevalence of impairment and disability. However, it can be argued that the primary goal should be to prevent the disorder in the first place, or arresting or reversing progression.

And finally, if you need to restock your supplements, please remember that by ordering through the on-line vitamin store you will be helping to maintain the web site and publication of IHN. You can find the store at <http://www.yourhealthbase.com/vitamins.htm>.

Wishing you and your family good health,

**William R. Ware, PhD, Editor**

### Highlights

Blood pressure increase and atherosclerosis	p. 8
Sugar and cardiovascular mortality	p. 9
Mercury & skin-lightening products	p. 10
Pesticides and risk of Alzheimer's	p. 10
GMO corn and tumors	p. 10

## DETOXIFICATION

Detoxification has become a very hot topic in the popular health literature. There are books about detoxification diets, juice fasting for detoxification, detoxification and longevity, liver detoxification, etc, etc. Since concern for toxic overload is unfortunately justified, it is of interest to attempt to separate mythology from approaches to detoxification associated with at least some more or less scientific evidence of human efficacy. The need for human studies is based on the fact that animals in general have different physiological and biochemical mechanisms for eliminating acquired toxic substances and animal studies are only partly transferable. This is unfortunate since the type of experiments routinely performed on animals cannot be carried

out with humans for obvious reasons. This review relies heavily on the pioneering and ongoing research and publications of Dr. Stephen J. Genuis and his colleagues at the University of Alberta.

### **TOXINS AND CHRONIC ILLNESS**

What are the determinants of the occurrence of adult chronic illness? The consensus appears to be infectious agents, genetics, psychological factors, nutrient deficiencies and toxins. Among these, according to the conventional wisdom, genetics appears to be the most important. It is called the genetic predestination paradigm, the short form of which implies the misfortune of having the wrong parents.<sup>1</sup> However the paradigm is challenged by the following: (a) Identical twin studies are not consistent with the paradigm; (b) ancestry frequently is a poor predictor of risks; (c) genomes have not significantly changed over eons but some disorders have escalated dramatically over periods extremely short by comparison; (d) migration and adoption of new lifestyles can profoundly change disease incidence. In fact, it has been estimated that 70% to 90% of disease risks are instead probably due to environmental issues.<sup>2</sup>

Genetic predisposition to disease has been well established. However, directly and permanently modifying genes does not appear to be the answer and thus the predisposition to specific diseases appears immutable. However, environmental factors interact with an individual's genome and can cause illness.<sup>1</sup> These are called *epigenetic influences*. Included are toxic chemicals, viral and fungal exposure and radiation, which are external and internal agents generated for example by a toxic excess of biochemicals associated with inflammation and metabolism and toxins associated with psychological stress. However, epigenetic actions represent only one of many ways that toxins adversely interact with human biochemistry and microbiology. The huge variety of toxins assures a significant variety of mechanisms.

If one also considers deficiencies in biochemicals required for humans to thrive, then the combination of toxins and these deficiencies represent together the environmental component of the etiology of illness.<sup>1</sup> In practice, mainstream medicine tends to ignore both. The belief that humans, if not undernourished, get everything by way of essential nutrients from their diet has the status of dogma. With external toxins, there is general agreement regarding heavy metals. For externally derived toxins, there is inadequate information regarding thresholds for toxicity since human studies are impossible, animal studies in general not definitive, knowledge of accumulation and locations of storage is lacking and it is not possible to adequately measure distributed body stores. Furthermore, clinical manifestations may require years to develop.

The fetus gets its toxins from the mother through the common blood circulation. Studies of cord blood typically reveal significant levels. The newborn is particularly sensitive to toxins which can adversely impact critical aspects of the development process all the way through to adulthood, especially with regard to the brain. This is called the silent epidemic and is the subject of a frightening study from Harvard just published in journal *Lancet Neurology*.<sup>3</sup> With the fetus or newborn there is obviously an incredibly complex developmental process involved and it is exquisitely sensitive to toxic interference. Consider four common toxins, mercury, lead, glyphosate (in Roundup) and the much publicized bisphenol A. All have atomic weights or molecular weights around 200 g. A rough approximation for the number of cells in the newborn child is a bit less than  $10^{12}$ , i.e. a thousand billion.<sup>4</sup> Using Avogadro's number, it is easy to calculate the amount required of any one of these toxins in order to have enough for one toxic atom or molecule for every cell in the newborn child's body. The number is about 0.3 ng, a third of a billionth of a gram. However, toxins are not evenly distributed and this fraction of a nanogram would in fact concentrate such that some cell contained considerably more, some less or zero. If the toxin accumulates with each exposure, then the toxic load constantly increases. Thus much smaller amounts are potentially dangerous.

The brain's development is uniquely sensitive to toxic chemicals. The theme of a recent book by Professor Philippe Grandjean (University of Southern Denmark and Harvard School of Public Health) is that the developing brain has only one chance to get it right, and how environmental pollution impairs normal brain development.<sup>5</sup> It is remarkable that women living in the modern, developed, chemical-saturated world can even give birth to normal babies who will then go on to develop normally. In fact, abnormalities at birth or miscarriage are not uncommon. Child mortality in the US is higher than in most developed countries. The mother probably exhibits no clinical symptoms associated with her toxic burden. The problem of maternal toxins appears to be getting worse.<sup>5</sup> However, toxins measured in the mother and in the cord blood provide a starting point for epidemiological studies involving follow-up of newborns which eventually will yield important information. *At present, the only solution appears to be either avoidance of exposure before and during pregnancy and while nursing, which is very difficult if not impossible, or detoxification prior to conception, which is almost entirely off the radar of modern medicine.*

Ignoring or denying environmental toxins is common. The argument that there is no "scientific" evidence of risk at current exposure levels is in fact the traditional approach

proven effective years ago by the tobacco industry. For example, many would agree that chemicals that mimic hormones are potentially bad, but maintain that the threshold of risk is above normal exposure, when in fact in many cases the threshold is unknown. When animal studies raise red flags, the response may be that the results are flawed or not transferable, even if normalized to body mass. But animal studies are routinely used by industry to establish “safe” human limits.

In the absence of definitive evidence based on human studies, it appears that the zero tolerance is the correct attitude. But with 80,000 chemicals out there, the number of potential toxins is too great, and therefore one must assume that one has an unavoidable toxic burden, the only question being what and how much. Thus the importance of detoxification not specific to any one toxin.

### **THE TOXIC ZOO**

The following is a general account of substances implicated as toxins. The importance and pathophysiology have been reviewed.<sup>6</sup>

- Naturally occurring organic substances. These include moulds and their metabolites and allergy-causing substance of plant and animal origin.
- Inorganic or elemental toxins. Included are the heavy metals arsenic, cadmium, lead, and mercury. Found in dust, drinking water, foods, dental amalgams, and consumer products. Some react strongly with sulphur containing proteins and inhibit enzyme controlled reactions. Heavy metals accumulate in the brain, liver, kidney and bone.
- Pesticides. These are intentionally distributed into the environment because they are toxic and act as insecticides, herbicides and fungicides. Yearly use is measured in tons. Human toxicity has been linked to neurological, endocrine, developmental, reproductive, respiratory and immunological disorders as well as cancer.<sup>7</sup>
- Persistent organic molecular pollutants. These include chemicals used as flame retardants, stain repellents, anti-wrinkle and non-stick chemicals, fragrances, chemicals added during food preparation, cleaning and cosmetic agents, etc., etc. Also, toxins leached from or released by plastics. Bisphenol-A, a so-called xenoestrogen, is the poster child of this class. Other chemicals include phthalates, stabilizers and dyes.

This list includes many synthetic chemicals to which humans have been exposed in only recently evolutionary history. Food borne pollutants increase in concentration as one goes up the food chain and by accumulation in organs and fatty tissue, form a pool of toxic substances in humans with many adverse health effects. Therefore one cannot assume human natural detoxification mechanisms that evolved over eons will be able to deal with this onslaught, a problem which intensified in a post-WWII chemical revolution with synthetic substances designed to enhance taste, flavour, efficiency, convenience, beauty, comfort and so it was claimed, safety. Today both naturally occurring and synthetic toxic substances are ubiquitous in the environment and in humans and unfortunately appear to be a significant cause of illness.<sup>1,6</sup> The manufacturers strongly dispute this suggestion, inevitably citing no absolute proof or evidence, a powerful approach which seems to work with at least some governments and regulatory agencies.

When these toxic chemicals accumulate in the body, they can reside in a number of locations and thus blood levels or urine levels or hair analysis fail to provide an accurate or even in some cases informative picture of the body burden. Inability to establish individual body burdens impacts not only toxicological studies but also attempts to determine the success of detoxification protocols.

### **AVOIDANCE OF TOXINS**

This obviously should have high priority but the devil is in the details. Sources of most toxic exposure are suggested in the above list of toxins. Thus it appears advisable to consider drinking and cooking with only reverse osmosis water, to regard tap water as suitable for

washing and toilets, and shower heads should have carbon filters. Attempts to achieve a chemical-free home are obviously important. Attention is directed to cosmetics and personal care items, cleaning and laundry chemicals, fabrics, carpets and other materials containing fire retardants and/or stain resistant chemicals, and weed and pest control substances. Highly efficient air filters may be important for air pollutants including moulds and small particulate matter. Avoiding frequent consumption of foods known to commonly contain toxins can reduce the body toxic burden. This includes not only some species of fish but also commercial canned food. The problem here is that the levels of toxins in food are highly variable and largely unknown, nor are official safe limits credible. In addition, some suggestions are simply not practical such as living only in older houses to avoid the out-gassing of building materials including insulation and particle board as well as new carpets and drapes. It is important to buy rugs, carpets, drapes and mattresses with great care because of toxic organic substances which these items emit, especially fire retardants.

The daily health news service *Natural News* has recently set up state-of-the-art laboratory for testing levels of toxins in foods, beverages, personal care products and supplements. The initial reports are shocking. The *Natural News* editor, who was instrumental in establishing this non-profit laboratory, recently reported a general conclusion from the analysis of over 1000 foods, supplements, junk foods and popular beverages for heavy metals and other toxins. The conclusion was that unless something is done about this problem, we are doomed.

### **DETOXIFICATION INTERVENTIONS**

The variety of toxins potentially present requiring elimination is so large that it should be evident there is no single detoxification protocol that is comprehensive. However, the problem is even greater since there is very little research on detoxification protocols, and the compartmentalization of toxins in the body further complicates the issue. Some detoxification protocols have been studied only in the context of individuals with very high toxic loads or frank poisoning. Drops in blood or urine levels may conceal large unaffected body stores. Hair analysis offers problems in interpretation. In what follows, the detoxification protocols that have received some scientific study will be discussed, and as well those without convincing evidence will be listed.

The first step in detoxification is to attempt to optimize the body's own mechanisms. In an important review of detoxification, Sears and Genies list the following dietary and supplemental intervention for which there is some evidence:<sup>7</sup>

- Glutathione and sulphur-containing foods such as eggs, broccoli, cabbage, onions and garlic are important. Supplementing with N-acetyl cysteine, selenium, taurine and/or methylsulfonylmethane (MSM) can support glutathione and metallothionein synthesis.
- Folate may assist arsenic metabolism and elimination.
- Alpha-lipoic acid or R-lipoic acid may assist in the detoxification of compounds resulting from mould exposure.
- Adequate calcium and zinc can reduce the absorption of heavy metals.
- Chlorella has been found to decrease absorption and increase excretion of toxicants. Evidence is for mercury, cadmium and dioxin.
- Fiber will reduce absorption and increase elimination. Note: care must be exercised in supplementing with fiber since excessive intake can trigger small intestine obstruction.
- Some evidence exists for the benefit of restoration of normal flora in the gut with probiotics in order to facilitate removal of toxins from the GI tract.<sup>8</sup>

Taurine decreases oxidative stress markers resulting from heavy metal exposure. Alpha lipoic acid regenerates reduced glutathione which is an important endogenous defence against heavy metals. N-acetyl cysteine is a chelator of toxic elements and may stimulate glutathione synthesis, especially in the presence of vitamins C and E. Glutathione itself is not

generally recommended as supplement since it is destroyed by digestion. However, there are novel delivery systems such as liposomes under development and one formulation is now available over-the-counter. Selenium is important in the context of detoxification. Selenium incorporated in an organic molecule is the indicated form and has been shown to increase mercury secretion and decrease stress-related biomarkers. Supplements not mentioned by Genuis and Sears include milk thistle, curcumin and green tea extract.

With regard to supplements, a company called Advanced Bionutritionals has a product called *Advanced Detox Formula* containing many of the supplements listed above. This formulation was prepared in collaboration with Dr. R. J. Rowen, a well-known integrative physician. Dose information is available on the company website for those seeking guidance regarding individual doses of some of the component supplements. This approach to detoxification includes chelation of heavy metals and their elimination mostly via the urine.

Genuis and associates have reported on an interesting and informative investigation termed the *Blood, Urine, and Sweat Study*. They collected blood, urine and sweat samples from 10 healthy individuals and 10 with health problems and measured levels of toxic elements,<sup>9</sup> phthalate compounds,<sup>10</sup> bisphenol,<sup>11</sup> and perfluorinated compounds and polychlorinated biphenyls.<sup>12</sup> These comprise a significant set of studies since the toxins for which they tested are among the most important in the context of current exposure. The results can be generalized as follows. In some cases some toxins were only found in sweat whereas for other individuals, toxins were also seen in blood or urine or both. Sweat analysis compliments blood and urine analysis yielding a more complete picture of the body burden of toxins. Induced sweating was identified as a useful and important intervention for toxin elimination although several toxins were not removed via this route. Nevertheless, these results should encourage the use of saunas for detoxification since there is demonstrated efficacy regarding most important toxins.

Sears *et al*<sup>13</sup> have reviewed 24 studies which examined cadmium, lead, mercury and arsenic in sweat. It was found that these metals may be extracted in appreciable quantities through sweating and the rates of excretion were reported for some metals to match or even exceed urinary excretion over a 24-hour period.

The fact that research clearly supports sweating for detoxification has no doubt contributed to the popularity of infrared saunas in the home. However, Sears and Genuis point out that there is no evidence supporting this type of sauna over wet and dry ordinary saunas.<sup>7</sup> Only sweating is important. However, for a home sauna, infrared types seem clearly preferable since they have a lower interior temperature and the heating of the body is mostly by direct radiation rather than via heated air. Saunas must be used with care since excessive sweating can cause one to faint, and the need to replace fluids and electrolytes in the same way as is routine with athletes. Discussions of homemade infrared saunas can be found on the internet as well as information on dangers and precautions (for example, Google Lawrence Wilson MD Sauna). Also, note that there are differences in opinion regarding near infrared and far infrared saunas, the former (for one person) being cheap and easy to build at home with old-fashion, near infrared heat lamps. Commercial units and kits are generally far infrared, probably because it is the most practical heat source. It is important to use totally untreated wood, no plywood, and no glue. Three or four 250 W infrared heat lamps appear sufficient to generate the desired effect in an enclosed space big enough for one person. One rotates very frequently to obtain uniform body heating. A two-foot distance from the lamps is claimed to be satisfactory.

Evidence supports exercise to help eliminate toxins, mostly through sweating, but it appears doubtful if it is a satisfactory substitute for the sauna during all 12 months of the year, at least in some locales, and many individuals may not exercise with sufficient intensity and duration to come close to the sweat loss in a sauna. Note there is an issue with some reabsorption of toxins from sweat and frequent use of a trowel and a post sauna shower are indicated.

## **CHELATION**

Heavy metal chelation has been reviewed in an excellent paper by Margaret Sears from Children's Hospital of Eastern Ontario Research Institute.<sup>14</sup> Chelation can be either oral, by injection or intravenous, the latter typically using a derivative of ethylenediamine tetraacetic acid (EDTA). In mainstream medicine chelators have generally been restricted to acute poisoning or pathological heavy metal overload (e.g. iron) or the removal of cadmium, lead and /or mercury in responses to evidence of elevated levels. Prescription chelators such as EDTA and DSMA require qualified and experienced practitioners. DSMA is frequently used as to establish baseline levels judged by the increased amounts of heavy metals appearing in the urine. However, there are no evidence-based laboratory reference ranges for guidance. Chelators can also simply shift some toxins from one place to another. Nevertheless, their value should not be underestimated.

Sears' review only briefly discusses supplements and suggests they be used in combination with prescription chelators. This seems debatable. Mentioned were the amino acid taurine and N-acetyl cysteine.

The basic mechanism of action is simple—the chelator binds the metal more strongly than naturally present molecules and leads to excretion via urine or stool, mostly the former. Large changes in urine levels of heavy metals can be witnessed on challenging with a chelator. Efficient action of the chelator requires that it have accessibility to the metals and that they are not bound more strongly than possible with the chelator. Interference is possible with other metals, i.e. a competitive process. This also leads to sequential elimination of metals from various “pools.” The efficiency can also be impacted by reabsorption of part of the circulating chelator-bound metal, in particular in the kidney.

The risk of unsupervised use of over-the-counter products such as Advanced Detox is the creation of a deficiency in essential and nontoxic metals. Ideally such an approach should be used under the supervision of a practitioner experienced in the use of the product. However, in Sears' review and as well the review by Sears and Genuis<sup>7</sup>, no warnings are given for supplementation with taurine, alpha lipoic acid, n-acetyl cysteine or selenium, the main active ingredients in such formulations as Advanced Detox, and these supplements are widely used.

## **PROTOCOLS FOR WHICH THERE IS NO EVIDENCE**

According to a review by Genuis in 2011, the following detox methods or protocols lack any evidence:<sup>8</sup> massage, ionic foot baths, colonic cleansing, food and drink mixtures, bloodletting, leeching, herbal supplements, medicated baths and hot springs, and so-called liver and gall bladder flushes. For oral zeolites, there is positive animal research but no human research had appeared in the literature as of when the review was prepared.

As regards blood-letting for detoxification, there is an issue associated with iron toxicity that does not appear in the detoxification literature. However, excess iron is toxic. As discussed at length in the October 2013 issue of IHN, iron removal by blood donation or bloodletting (phlebotomy) is a highly effective intervention. In the discussion in IHN, and in a recent journal article by your editor,<sup>15</sup> it is suggested that in fact iron may be a much bigger issue in terms of toxicity than generally appreciated, and that blood donation several time a year may be an important addition to a program for staying healthy. The conventional wisdom does not regard iron as toxic until the body stores are very high, such as in the genetic disorder hemochromatosis or iron overload induced by a large number of blood transfusions. It is argued that this is incorrect and many individuals are at risk.

## **CONCLUSIONS AND THE FUTURE**

Do-it-yourself detoxification can be accomplished easily using sweating and a regime of supplements. Both are important because urinary excretion is an essential component of

detoxification and increasing it important. Blood donation should be seriously considered, but only after a serum ferritin value has been obtained to make sure iron stores are not depleted.

It will probably be a long time before significant attention is given to the issue of toxins and health by mainstream medicine. It is at present not part of the culture of modern medical practice except in cases of obvious profound toxicity. Lead is probably the most widely recognized and treated exogenous toxins. This is very unfortunate since it appears clear that numerous exogenous toxins cause damage and disease and that detoxification offers hope of a cure directed at the cause. Physicians who successfully treat autism routinely use detoxification as part of the whole-person approach, but only a tiny fraction of autistic children receive this enlightened, multifactorial treatment. Hopefully, more concern will arise concerning prenatal toxicity as well as the impact of toxins on childhood development. If this does not happen, it is easy to visualize a real disaster. Here the concern is mostly with the brain.<sup>5</sup>

The difficulties in establishing body loads of toxins and the absence of comprehensive treatments compatible with the requirements of modern evidence-based medicine present a huge barrier to solving the problem of preventing or treating illness associated with toxic substances. Furthermore, interest is inhibited by official so-called safe limits, which mostly have no human evidence since the experiments needed are not ethical and mainstream medicine and regulatory bodies do not recognize the limitations of applying animal test results to humans. Finally, and probably most important, there are huge financial interests involved which will fight with impressive skill and success any attempt to increase the profile of environmental toxins in human health. The subject is also not particularly fashionable as a research area and not something presumably emphasized or even adequately covered in medical school. Thus, any reasonable view of the future in this context must be pessimistic. However, there are signs of a grass-roots revolt in some states, and the European Union appears to show significant enlightenment in this context. One is left with the alternative of trying everything that appears safe, requires minimal professional assistance and is backed by some evidence, and then hope for the best. We are indeed on our own.

## **BLOOD PRESSURE INCREASE IN EARLY ADULTHOOD PREDICTS SUBCLINICAL ATHEROSCLEROSIS IN MIDDLE AGE**

An interesting study has just reported where a prospective cohort of 4681 men and women aged 18 to 30 at baseline had 25 years of blood pressure data available, allowing the cohort to be stratified according to both the baseline BP and the rate of increase over this period of time.<sup>16</sup> Coronary artery calcium scores (CACS) were available for 3442 individuals at year 25 and a comparison was made between those with CACS  $\geq$  100 with those  $<$  100 Agatston units. CACS scores range from zero to several thousand, but 100 is considered a threshold for concern about the extent of coronary atherosclerosis. Blood pressures and their trajectories ranged from low initial and stable over time to initially elevated and increasing over time. The relative risk of having elevated CACS when the low-stable group was compared to the elevated-increasing group was almost four-fold when systolic trajectory was used and over 2 fold when diastolic trajectory was used. When a mid-point BP trajectory was used (SBP + DBP/2), a four-fold increase in relative risk was found. For those for which baseline elevated BP was stable, there was also a significant increased risk of elevated CACS with relative risk increases of about 50% of those for the elevated and increasing BP profile, again in comparison with the low baseline stable group. The models used included taking into account antihypertensive medication. Out of the 3442 individuals with CACS data, 309 (9%) had significant atherosclerosis as judged by the CACS cut-off used. When instead of 100, a cut-off of CACS  $>$  0 was used, similar but somewhat attenuated results were obtained. For perspective, note that for the low-stable group, mean CACS were 16.9,

whereas for the elevated-increasing group the mean was 190 Agatston units, both at 25 years. Clinically, these reflect large and significant differences in CVD risk.

This study adds to what was known, i.e. blood pressure is a significant risk factor for CVD. Young adults with baseline elevated BP, either stable or increasing over 25 subsequent years, were at increased risk of coronary artery atherosclerosis which is a prerequisite for coronary heart disease events. The cut-off of 100 units for the CACS is commonly used in studies as a marker for significantly enhanced risk. The results are also consistent with previous studies which demonstrated that time averaged or cumulative BP over a number of years were a better predictor of future coronary heart disease, stroke, heart failure and vascular dementia than BP values measured at the time of risk assessment.<sup>17</sup>

## **CARDIOVASCULAR MORTALITY RISK ASSOCIATED WITH ADDED SUGAR**

The evidence of health risks associated with consumption of added sugar is rapidly increasing. In a study just published in *JAMA Internal Medicine*, investigators from the U.S. Centers for Disease Control, Emory University and Harvard used data from US National Health and Nutrition Examination Surveys covering 1999 to 2010 and examined the association between added sugar consumption as a percent of daily calories and cardiovascular mortality.<sup>18</sup>

In the 2004-2010 period, most adults consumed 10% or more of calories from added sugar (71.4%) and approximately 10% consumed 25% or more. The mortality analysis included 11,733 participants with 831 cardiovascular disease (CVD) deaths during a median follow-up of about 15 years. Results according to the quintile of calories from added sugar are given in the table below which also includes the number of subjects within each sugar intake quintile in order that one person is harmed during an exposure to added sugar over 15 years. These numbers needed to harm were provided in the journal article and are based on hazard ratios adjusted for a large number of confounding factors. The percentage harmed over 15 years provides a different perspective based on the same data.

### **CARDIOVASCULAR MORTALITY ACCORDING TO THE PERCENTAGE OF ADDED SUGAR CONSUMED**

	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q5</b>
% calories in added sugar	0-<9.6	9.6-<13.1	13.1-<16.7	16.7-<21.3	≥ 21.3
Relative risk increase	REF	7%	18%	38%	103%
Number needed to harm		265	109	53	22
Percentage harmed		0.3%	0.9%	1.9%	4.6%

For a 2000 calorie diet, 21.3% represents 426 calories or about 100 g. Sugar has about 4 calories per gram. The *average* daily American consumption of sugar is estimated at 350 calories.

Two aspects of these results are immediately evident from the table. First, for the 10% of the population with added sugar representing ≥ 21.3 % of total calories, the risk of death due to cardiovascular causes doubles compared to low consumption, and the risk in fact increases exponentially with added sugar consumption. The second important aspect is that the large relative risk increases seen between quintiles Q4 and Q5 are accompanied by numbers need to harm that are large enough to be meaningful since this embraces an entire national population. In addition, when one adds CVD mortality to the other CVD related risks

associated with the consumption of added sugar, such as weight gain, obesity, type 2 diabetes, hypertension, abnormal blood lipids, and non-fatal events of cardiovascular disease, there seems little question of the merit of following the World Health Organization recommendation of 10% or less of calories from added sugar. To accomplish this is not simple since hidden added sugar is very common. This view is strengthened by the growing belief that elevated excessive sugar consumption encourages both the development and metastasis of cancer cells.

## **NEWS BRIEFS**

### **MERCURY IN SKIN-LIGHTENING PRODUCTS**

Skin lightening or whitening is done globally through the use of cosmetic products which are readily available in stores and the internet. A recent study from Loma Linda University School of Medicine examined the mercury content of 549 such products. It was found that 6% contained mercury above 1000 parts per million (ppm) and among those products containing this toxin, 45% had levels above 10,000 ppm. The FDA limits the amount of mercury in cosmetics to 1 ppm, yet for US samples tested, 3.3 % contained mercury in excess of 1000 ppm.<sup>19</sup> Absorption through the skin can at the least increase the body mercury load, and at worst, cause frank mercury poisoning, as was reported in 2000.<sup>20</sup>

### **ELEVATED BLOOD PESTICIDE LEVELS AND RISK OF ALZHEIMER'S DISEASE**

A study just published examined the correlation between the levels of DDE, a metabolite of the famous pesticide DDT, and the risk of developing Alzheimer's disease. Using the case-control format, 86 cases of late-onset AD were compared to 79 controls. Levels of DDE were 3.9-8 fold higher in the blood of those with AD when compared to the controls. This translated into a 4.18 fold increase in risk AD in the highest tertile of DDE levels and this was accompanied by evidence of increased severity. Blood levels of DDE were also highly correlated with brain levels of this toxin found at autopsy. It was also found that carriers of the APOE4 genetic predisposition to AD were more susceptible to the adverse effects of DDE.<sup>21</sup> While DDT is no longer allowed in many countries, there is a large environmental residue from long and extensive prior use.

### **GENETICALLY MODIFIED CORN, RATS AND TUMORS. THE SERALINI STUDY SAGA**

As was mentioned in an earlier issue of IHN, an Italian study headed by Gilles-Eric Seralini, published in *Food and Chemical Toxicology* found that rats fed GM corn over 2 years developed massive and horrific tumors.<sup>22</sup> This paper was recently retracted, not by the authors, but by the editors of the journal. This occurred shortly after a former Monsanto scientist was brought into the journal as biotechnology editor. The major criticism of the paper, obviously not by peer review but after publication by the editor, was that the rat strain was not proper and the number of rats too small. It turns out that Monsanto published a similar study in the same journal eight years before which used the same strain and the same number of animals. The Monsanto study lasted only 90 days which is too short a period over which to detect tumor formation. Many scientists were up in arms about the article withdrawal, writing articles and letters to editors, including one signed by dozens of scientists criticizing the journal for the retraction.

The issue here is presumably residual herbicide from Monsanto RoundUp which is ingested when corn is eaten. Obviously, no controlled human studies have been conducted on the adverse effects of the chemical, a glyphosate. Glyphosate is a powerful endocrine disrupter. In an article published on the website *GMWatch* (January 9, 2014) by David Schubert, Salk Institute, University of California, San Diego, criticizing the journal's action, it was pointed out that one reason for great concern associated with suppressing the sort of evidence found by Seralini's group involves anecdotal evidence of a dramatic increase in birth defects and

cancer in areas of Argentina that coincided with the introduction of GM soy which has the same glyphosate issue. For the withdrawn article, Google the author.

It does not appear that anyone has studied the efficacy of the detoxification methods discussed above for this herbicide nor is there any definitive data on minimum safe exposure.

#### REFERENCES

1. Genuis SJ. What's out there making us sick? *J Environ Public Health*. 2012;2012:605137.
2. Rappaport SM, Smith MT. Epidemiology. Environment and disease risks. *Science*. 2010;330:460-461.
3. Grandjean P, Landrigan PJ. Neurobehavioural effects of developmental toxicity. *Lancet Neurol*. 2014;13:330-338.
4. Bianconi E, Piovesan A, Facchin F et al. An estimation of the number of cells in the human body. *Ann Hum Biol*. 2013;40:463-471.
5. Grandjean P. *Only one chance. How environmental pollution impairs brain development*. Oxford University Press; 2013.
6. Genuis SJ. The chemical erosion of human health: adverse environmental exposure and in-utero pollution - determinants of congenital disorders and chronic disease. *J Perinat Med*. 2006;34:185-195.
7. Sears ME, Genuis SJ. Environmental determinants of chronic disease and medical approaches: recognition, avoidance, supportive therapy, and detoxification. *J Environ Public Health*. 2012;2012:356798.
8. Genuis SJ. Elimination of persistent toxicants from the human body. *Hum Exp Toxicol*. 2011;30:3-18.
9. Genuis SJ, Birkholz D, Rodushkin I, Beeson S. Blood, urine, and sweat (BUS) study: monitoring and elimination of bioaccumulated toxic elements. *Arch Environ Contam Toxicol*. 2011;61:344-357.
10. Genuis SJ, Beeson S, Lobo RA, Birkholz D. Human elimination of phthalate compounds: blood, urine, and sweat (BUS) study. *ScientificWorldJournal*. 2012;2012:615068.
11. Genuis SJ, Beeson S, Birkholz D, Lobo RA. Human excretion of bisphenol A: blood, urine, and sweat (BUS) study. *J Environ Public Health*. 2012;2012:185731.
12. Genuis SJ, Beeson S, Birkholz D. Biomonitoring and Elimination of Perfluorinated Compounds and Polychlorinated Biphenyls through Perspiration: Blood, Urine, and Sweat Study. *ISRN Toxicol*. 2013;2013:483832.
13. Sears ME, Kerr KJ, Bray RI. Arsenic, cadmium, lead, and mercury in sweat: a systematic review. *J Environ Public Health*. 2012;2012:184745.
14. Sears ME. Chelation: harnessing and enhancing heavy metal detoxification--a review. *ScientificWorldJournal*. 2013;2013:219840.
15. Ware W. The risk of too much iron: Normal serum ferritin levels may represent significant health issues. *Journal of Orthomolecular Medicine*. 2013;28:149-158.
16. Allen NB, Siddique J, Wilkins JT et al. Blood pressure trajectories in early adulthood and subclinical atherosclerosis in middle age. *JAMA*. 2014;311:490-497.
17. Sarafidis PA, Bakris GL. Early patterns of blood pressure change and future coronary atherosclerosis. *JAMA*. 2014;311:471-472.
18. Yang Q, Zhang Z, Gregg EW, Flanders WD, Merritt R, Hu FB. Added Sugar Intake and Cardiovascular Diseases Mortality Among US Adults. *JAMA Intern Med*. 2014.
19. Hamann CR, Boonchai W, Wen L et al. Spectrometric analysis of mercury content in 549 skin-lightening products: Is mercury toxicity a hidden global health hazard? *J Am Acad Dermatol*. 2014;70:281-287.
20. Weldon MM, Smolinski MS, Maroufi A et al. Mercury poisoning associated with a Mexican beauty cream. *West J Med*. 2000;173:15-18.
21. Richardson JR, Roy A, Shalat SL et al. Elevated Serum Pesticide Levels and Risk for Alzheimer Disease. *JAMA Neurol*. 2014.
22. Seralini GE, Clair E, Mesnage R et al. Long term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize. *Food Chem Toxicol*. 2012.

**Please Visit Our Vitamin Store**



<http://www.yourhealthbase.com/vitamins.htm>

**Editor: William R. Ware, PhD**

INTERNATIONAL HEALTH NEWS is published 10 times a year by  
Hans R. Larsen MSc ChE, 1320 Point Street, Victoria, BC, Canada, V8S 1A5  
E-mail: [editor@yourhealthbase.com](mailto:editor@yourhealthbase.com) World Wide Web: <http://www.yourhealthbase.com>

ISSN 1203-1933 Copyright 2014 by Hans R. Larsen

INTERNATIONAL HEALTH NEWS does not provide medical advice. Do not attempt self-diagnosis or self-medication based on our reports. Please consult your healthcare provider if you are interested in following up on the information presented.