

GLASS provides information & referrals on lead poisoning & lead contamination prevention & management, with the goal of eliminating lead poisoning globally & protecting the environment from lead.

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[LID 9496]

Lead, Ageing and Death

By Ewan MacAulay McDonnell, The LEAD Group Inc
Updated 04 April 2011

When old people die, who ever asks the question – "Did lead kill this person?"

As you age you become more likely to suffer from heart disease, heart attack, stroke, renal problems, and Alzheimer's disease or tremors but what you may not realise is that these symptoms are connected with having lead in your system.

With so many people having higher blood lead levels in the past than today, it is little wonder that we associate ageing with many of the effects of lead poisoning, but especially:- poor memory and hearing, falls (from loss of balance), reduced sperm count, loss of libido, strokes and heart attacks (from raised blood pressure), tooth decay, and Alzheimer's disease. It is fair to say that all these effects of lead add up to a reasonable description of what we think of as "normal" ageing and it is certainly time that we measured blood lead levels in older people who display these symptoms before discounting their symptoms as just "a natural part of getting old". (14)

Lead gathers in the body as you are exposed to it over time. There is no safe level of lead within the body and the threshold for safe lead levels has gradually been lowered over the decades as data has improved and further research has been conducted. The US CDC currently lists the threshold as < 10 µg/dL level, however more recent research is showing even levels as low as 2.5 µg/dL have a detrimental health impact, more so than increases from 10-20 µg/dL or 20-30 µg/dL. (16)

According to a recent Archives of Internal Medicine article: "Blood lead and exposure to lead throughout life has also been associated with increased death rates in older people where "after adjustment for potential confounders, individuals with baseline blood lead levels of 20 to 29 µg/dL (1.0-1.4 µmol/L) [two to three times the CDC goal to be below 10 µg/dL, but much less than the level that an Australian worker must be moved off a lead task – 50 µg/dL] had a 46% increase in mortality (all causes), 39% increased circulatory mortality, and 68% increased cancer mortality compared with those with blood lead levels of less than 10 µg/dL (<0.5 µmol/L)." (14)

In fact a blood lead level of 2 µg/dL has been connected in an American study by the CDC with higher rates of cardiovascular disease. A blood lead level of 3.63 µg/dL or greater was connected with an 89% greater rate of death from heart attack, and a 250% greater chance of stroke (15). A higher rate of Arteriosclerosis has been found in adults with Blood lead levels of greater than 10 µg/dL. (18)

Lead becomes stored within your bones, which acts like a sort of Reservoir. (17) From there, it causes a second round of negative impacts on Haem synthesis, vitamin D metabolism, and

The LEAD Group Inc. PO Box 161 Summer Hill NSW Australia 2130

GLASS Phone: Freecall 1800 626 086; +61 2 9716 0132 Fax: +61 2 9716 9005

Email: www.lead.org.au/cu.html Web: www.lead.org.au

kidney function. Initially Lead is a neurotoxin causing similar symptoms to Alzheimer's disease and for similar reasons and hence is associated with it (12; 3). If you have been exposed to it as a child changes in gene expression will create additional health problems for you later in life, including the build up of proteins in the brain in a pattern similar to Alzheimer's disease (4). Cumulative lead exposure is also linked to poorer performance in learning, memory and visual-motor tasks for older subjects and this negative impact can be exacerbated by stress (20). This may be because early-childhood lead exposure has led to poorer-school performance or because lead may accumulate in the myelin sheath that surrounds some neurons in the brain, connecting it to neuro-degenerative diseases. (19) In one recent study the mean Blood lead level for subjects was 3.5 µg/dL and tibia lead level was 18.7 µg/dL. The higher tibia lead levels were consistently associated with worse cognitive function in tested subjects. (21)

Another neurological disease that may be associated with Lead is Essential Tremor (ET). Essential Tremor is an incurable age-related disease whose symptoms involve tremors of the hands and head. At present its cause is unknown. Laboratory animals and humans exposed to high levels of lead have displayed similar symptoms. Pb blood levels in ET patients have been found to be higher than in controls. ET is a very common neurological disease in subjects over 60, and can be as prevalent as up to 20.5% of the elderly. (17)

As well as Lead speeding up brain ageing (1; 2), as you age your bones demineralise, meaning they release lead back into your blood stream. (13; 8) This means the toxic effect of lead exposure in younger years, such as industrial work dealing with lead substances, such as lead-based paint or fuel containing lead will add to any lead exposure you are currently experiencing and cause a cumulative impact on your health. (16) Adults who have been exposed to lead in the workplace and at home throughout their lives are more susceptible to lead-related health risks such as cardiovascular disease, high blood pressure (hypertension), stroke, renal failure and osteoporosis. (5; 6; 7; 9; 10)

The implications of lead exposure early in life on menopausal women have also been investigated; indicating that exposure to lead throughout life may result in heightened lead levels in blood throughout menopause. Studies have also found that Hormone Replacement Therapy (HRT) had a negative effect on blood lead levels, where women using HRT had lower blood lead levels than postmenopausal women who report not using HRT. (4)

There is also a fact-sheet which comprehensively describes the effects of lead poisoning on various groups of people, sorted into 'children', 'prenatal development and reproductive health effects' and 'adults'. Listed within these groups are implications of lead poisoning in categories including nervous system, peripheral nervous system, growth and development, cognitive development, behaviour, hearing, sight, movement and muscular, digestive system, renal, blood and circulation, foetal, kidneys, cardiovascular and circulation, intellectual and mental, sensory, bone, muscle and joint and death. Also listed are the effects of lead known from animal studies. This fact sheet can be found at www.lead.org.au/fs/fst7.html. (11)

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