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Environmental Toxins and Their Effects on Brain Health

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There are several suspected environmental toxins thought to have a spectrum of health effects including those related to cancer, the reproductive system, and the immune system. This synopsis focuses on some of the more common environmental toxins that have reported scientific evidence of detrimental effects on brain health, particularly in adults. In addition, methods of avoiding these toxins and limiting their detrimental effects on the body have been included.

Pesticides

Pesticides include herbicides, fungicides, and insecticides and are used in farming, household products, and other sprays and treatments to rid crops, households, or individuals of pests. The greatest links that pesticides have had to brain health are in relation to Parkinson's disease. Recent reports have identified two pesticides in particular that apparently increase the risk of Parkinson's disease; paraquat is a broad-spectrum herbicide and rotenone is a widely used insecticide.[1] Other pesticides that have been linked to Parkinson's disease include benomyl and maneb.[2,3] Parkinson's disease has also been linked to inflammation in the brain. Antioxidants that can cross the blood-brain barrier including sulforaphane, hydroxytyrosol, and N-acetyl-L-cysteine found in the Olivamine10® Max containing Pinnaclife Brain Health and Detox Support supplements may decrease the risk of Parkinson's disease by decreasing oxidation, and subsequent inflammation.

Dioxins

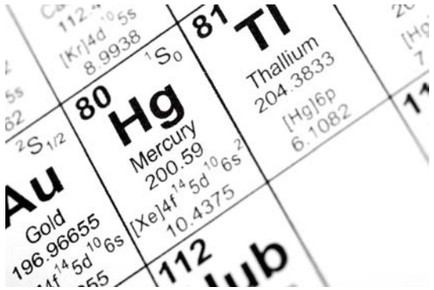
Dioxins and dioxin-like compounds including TCDD, PCDD, and PCDF, are chemicals formed from combustion including incineration, burning fuels, and cigarettes. They are classified as persistent environmental pollutants because they can last in the environment for long periods of time. They can also persist in animal fat.[5] Scientific evidence suggests that dioxins can affect brain cells by binding to proteins found on the surface of brain nerve cells.[6] Cognitive impairment has been reported with humans that have been exposed to dioxins and dioxin-like compounds.[7] Dioxin exposure can be reduced by removing the fatty skin from fish and chicken, selecting lean cuts and trimming fat from meat, and by drinking low fat milk. In addition, the Pinnaclife supplements include ingredients such as N-acetyl-L-cysteine, which is known to increase the elimination of many toxins.[8]

Toxic Metals

Many metals are required for human health including iron, copper, and zinc, but excessive levels of these metals may be toxic. Certain metals, however, can be toxic and affect the neurological system even at low levels including arsenic, lead, mercury, and cadmium.[16] Toxic metals can be found in pesticides, preserved wood, building materials, and mining debris. Cadmium is present in cigarette smoke, and mercury can be found in some thermometers and fluorescent light bulbs. Lead can be found in older paint and plumbing materials. High levels of lead exposure can cause impaired consciousness and paralysis.[17] N-acetyl-L-cysteine found in Pinnaclife supplements has been shown to reduce metal toxicity in humans.[8]

Phthalates

Phthalates are chemicals used to lengthen the life of certain products and soften plastics. They have been used as plasticizers and adhesives, as well as fragrances and lubricants.[12] Phthalates have been linked to attention deficit disorder (ADD), although the mechanism of its role in ADD is not known. However, the possibility that phthalates may cause brain inflammation has been proposed.[13] Pinnaclife supplements include potent antioxidants that can reduce inflammation.



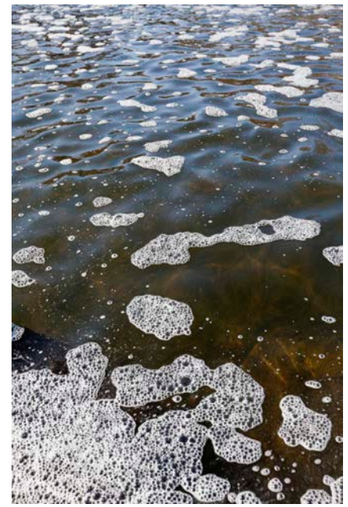
Volatile Organic Compounds

Volatile organic compounds (VOCs) include chemicals found in electronic devices, protective coatings on furniture and equipment, paints, solvents, and dry cleaning products.[14] VOCs in indoor air have been linked with "sick building syndrome" as described by the World Health Organization (WHO) including symptoms such as irritated eyes, nose and throat, dry mucous membranes, red skin, tiredness and headache, dizziness, and cough with no medical explanation. VOCs include: toluene, chloroform, formaldehyde, benzene, and methylene chloride. Exposure to VOCs has been shown to result in decreased psychological performance including reduced ability to learn.[15] Some electronic devices can detect VOCs and tests can be performed to check whether individuals are exposed. Increased ventilation can decrease exposure and indoor products that produce VOCs should be avoided.

PCBs and PBDEs

PCBs and PBDEs are industrial chemicals that are classified as persistent organic pollutants because they linger in the environment. PCBs have been banned, but were used in plasticizers, adhesives, and electrical equipment.[9] PBDEs are a class of flame retardants that have been used in polyurethane foams, textiles and plastics. PCBs are toxic to brain nerve cells because they alter brain chemical signaling. PCBs are known to affect behavior, memory and learning.[10] PBDEs are also neurotoxic and affect cognitive functioning.[11] PCBs and PBDEs can persist in animal fat, therefore, avoiding fat as discussed previously for dioxins, can help reduce exposure. Pinnaclife supplements including Detox Support promote toxin elimination.

Summary



Other toxins not discussed include natural neurotoxins produced by fungi found in foods, and by bacteria including blue-green algae (cyanobacteria) found in algal blooms in oceans, ponds and lakes. In summary, human exposure to toxins seems unavoidable, however, the duration or length of exposure, route of exposure (i.e. food vs. air), and levels of exposure are important factors that determine health outcomes. Individuals can decrease levels and durations of exposures by eating more healthy foods, avoiding products known to include toxins, by helping their bodies detoxify through physical exercise and proper sleep (shown to be essential for detoxification), and by using Olivamine10® Max antioxidant-containing Pinnaclife supplements including Brain Health, Sleep Support and Detox Support that also help fight inflammation.

References

1. Toxicol Sci 2011; 124:225-250. **2.** Proc Nat Acad Sci 2013; 110:636-641. **3.** Trends Pharmacol Sci 2009; 30:475-483. **4.** J Neurochem 2002; 81: 1285-1297. **5.** WHO Fact Sheet N°225 May 2010. **6.** Neuroreport 1995; 15: 2557-2560. **7.** Environ Health Persp 2013; 121: 613-618. **8.** Alt Med Rev 1998; 3: 114-127. **9.** Environ Health 2008; 7:2-9. **10.** Environ Sci Technol 2010; 44: 2864-2869. **11.** Toxicol Sci 2010; 118: 635-642. **12.** Atmos Environ 2009; 43: 170-181. **13.** Environ Res 2014; 128: 64-69. **14.** Epa.gov 2010-11-17; www.epa.gov/iaq/voc.html **15.** Atmos Environ 1991; 25A: 1417-1426. **16.** Met Ions Life Sci 2011; 8: 247-262. **17.** Annu Rev Med 2004; 55: 209-222.