

Scientific Study

Chemical Induced Brain Dysfunction Shown in Multiple Chemical Sensitivity

Some of the earliest research done on people with multiple chemicals sensitivity (MCS) involved brain images taken before, during, and after chemical exposure.

These early studies consistently showed lower baseline blood flow to the brain which worsened during low-level chemical challenges, leading to the conclusion that chemical exposure caused neurocognitive impairment in this population.

Researchers in Spain repeated this procedure with chemical products at non-toxic concentrations and compared patients diagnosed with MCS to those without MCS.

The MCS patients consistently showed reduced baseline blood flow to the brain, which worsened after the chemical challenge, again supporting the earlier findings.

People with MCS experience neurological and other symptoms upon exposure to minute amounts of chemicals found in fragrances, pesticides, and other common chemicals.

Orriols and colleagues say these findings support the “poorer quality of life and neurocognitive function at baseline, and neurocognitive worsening after chemical exposure” experienced by people with MCS.

The method used for the brain scans is known as SPECT (Single Photon Emission Computerized Tomography) technology. SPECT performs brain scans which record brain functioning by measuring

perfusion (blood flow).

Individuals with chronic symptoms show long-term reduced blood flow to the brain and reduced ability of the brain to take up a tracer substance in the early phase of injection, indicating a pattern of neurotoxic metabolic abnormality.

Over 90% of MCS patients exhibit a pattern of neurotoxic metabolic abnormalities in the brain that is consistent with toxic encephalopathy, but that is not consistent with the changes associated with previously implicated psychiatric diseases.

SPECT brain scans on MCS patients with chronic symptoms following toxic exposure to various petrochemical, perfume, and related compounds have provided researchers evidence to support an organic, biological basis to MCS when compared with healthy control subjects.

SPECT scans have uncovered blood flow alterations in patients with fibromyalgia, typically involving increased uptake of tracer substances, leading researchers to questions whether fibromyalgia may also be a toxicological disease of a different nature.

Chemicals appear to be capable of altering brain function in a significant way. This alteration of brain function seems to be responsible for the many neurocognitive effects of MCS.

Reference

Orriols R, Costa R, Cuberas G, Jacas C, Castell J, Sunyer J. Brain dysfunction in multiple chemical sensitivity. *J Neurol Sci.* 2009 Oct 2.

