Lead Poisoning

Symptoms or Behaviors

- Abdominal pain
- Anemia
- Anorexia
- Constipation
- Diarrhea
- Distractibility
- Headaches
- Hyperactivity
- Hyperirritability
- Impulsiveness
- Lethargy
- Listlessness
- Nausea
- Vomiting
- Weakness

Because of the similarity of these symptoms to other condition (e.g. stomach flu), recognizing the condition is difficult.

About the Disorder

Lead, a common metallic compound, does not serve any biologic function in the human body. Lead poisoning also referred to as "plumbism", is an acquired, toxic condition that is preventable. It is one of the most common and significant children's environmental health problems in the United States today. Because of the similarity of lead poisoning symptoms to other conditions (e.g. stomach flu), recognizing the condition is difficult.

Lead is especially harmful to children under the age of six, but anyone who experiences over-exposure can get lead poisoning. Blood lead screening is recommended by the Minnesota Department of Health, based on research from the Centers for Disease Control and Prevention. The Center for Disease Control and Prevention has recommended that all children be screened at ages 1 and 2.

Blood lead level screening can be done using capillary or venous blood samples. Only venous blood samples are considered diagnostic. All elevated capillary samples must be confirmed with a venous blood level. A laboratory report alone does not qualify as a medical diagnosis. There is no level of lead that is normal: the normal lead level is zero ug/dL (micrograms of lead per deciliter of blood). Although it was thought that only blood levels higher than 80mg/dl (milligrams per deciliter) were of concern, now a level of only 10mg/dl is considered dangerous.

Treatment for Lead Poisoning consists of a diet low in fat and high in iron, as well as Chelation Therapy, which involves the injection of intramuscular injection of chelating agents (i.e. substance that bind with the lead) for purpose of removing excess lead from the body. For children, Chelation Therapy is usually begun when blood levels reach 25mg/dl; in adults, a level of 51mg/dl is a common starting point.

ETIOLOGY

Lead poisoning, caused by the concentrated or repeated inhalation, ingestion or absorption through the skin of lead or lead compounds, can result in severe mental, emotional and/or physical impairment in children. Lead can be inhaled via household dust, airborne fumes, lead particles (from industrial emissions) or dust from lead based paint. Lead can be ingested or absorbed through the skin via water, lead paint chips, food or dink from lead-soldered cans, food stored in bags painted with lead paint, contaminated soil, or dust or gunshot wounds.

Why is lead a problem? Young children have developing nervous systems that are vulnerable to lead. Studies have shown reduced IQ, decrease hand-eye coordination and aggressive behavior. Large amounts of lead in a child's blood can cause brain damage, mental retardation, behavior problems, anemia, liver and kidney damage, hearing loss, hyperactivity, developmental delays, other physical and mental problems and in extreme cases, death. Studies have shown when blood lead levels are reduced by 10ug/dL this raises IQ by 2.6 points.

Minnesota Low Incidence Project

Developed with Minnesota Low Incidence funds, Region 10 Physical Health Disabilities Network, and School Nurse Organization of Minnesota (SNOM)

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Educational Implications

Lead poisoning has significant effect on a child's ability to reach his or her full potential. Teachers in several studies report that children with high lead levels are "more distractible, less persistent, more dependent, less well-organized, less able to follow directions, and generally lower in overall functioning than students with lower lead levels." Other research shows that children who are exposed to lead early in life had a sevenfold increase in risk of failing to graduate from high school and a sixfold increase of risk for a reading disability.

Instructional Strategies and Classroom Accommodations

- Use repetition.
- Use multi-sensory instruction (visual, olfactory, kinesthetic, tactile, and auditory.
- Consider modifying or adapting the curriculum to better suit the student's learning style.
- Allow students to move about within reason if hyperactive.
- Provide consistent structure and clearly define expectations.
- Reduce workload at home or school when necessary.
- Encourage school attendance-to prevent absences; modify the child's class schedule or reduce the time spent at school.
- Educate other students about the hazards and effects of Lead Poisoning.

Resources

Books:

Children with Disabilities, 5th edition Batshaw, Mark L., M.D., 2002.

Meeting the Needs of Students with Special Physical and Health Care Needs. Hall, Paul Brookes & Leigh, Jennifer. Prentice Hall, 1999.

The Educator's Guide to Medical Issues in the Classroom. Kline, Frank M., Silver, Larry B., and Russell, Steven C. (2001) Paul H. Brookes Publishing Company.

Websites:

Alliance For Healthy Homes
www.afhh.org

Help Prevent Childhood Lead Poisoning: A Resource for Parents
http://nolead.home.mindspring.com

National Safety Council
Fact Sheets
www.nsc.org/library.facts/

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