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Environmental Factors in ADHD

Twin studies show that:

- genes strongly influence the development of ADHD
- non-shared environmental factors, such as birth complications, account for 10% to 25% of the risk of developing ADHD
- shared environmental factors, such as the location of the family home, only play a small role in ADHD

Environmental factors that are associated with a higher risk of ADHD include:

- complications during pregnancy, at birth, or shortly after birth
- toxic chemicals in the environment
- head injury

ADHD and complications of pregnancy, at birth, and in the newborn period

Problems at birth or shortly after birth seem to increase the risk of ADHD. These include:

- prematurity
- low birth weight
- need for an incubator
- oxygen therapy
- surgery

Children who are exposed to nicotine or alcohol before birth are also more likely to develop ADHD. Children with ADHD are:

- 2.5 times more likely to have been exposed to alcohol
- 2 times more likely to have been exposed to cigarette smoke before birth

Children of mothers who smoked during pregnancy are more likely to have:

- symptoms of inattention
- lower academic achievement
- poorer visuo-spatial reasoning

ADHD and environmental chemicals

Some chemicals interfere with behaviour and learning. Researchers believe that these chemicals may contribute to ADHD. They include lead and polychlorinated biphenyls (PCBs). Research over the past several decades has shown that these chemicals have many different harmful health effects. This research has stimulated government action, and there are now much more stringent guidelines for using and disposing of these chemicals. However, children may still be exposed to them.

Lead and ADHD

Lead occurs naturally in the environment. Since the 1970s, lead exposure in high amounts is less common, because leaded gasoline and lead paint are no longer used. However, even small amounts of lead can be harmful, especially to children. Potential sources of lead include:

- contaminated dust and soil
- paint chips from older houses
- dust from industries such as smelting or refining, which may be carried home on workers' clothing
- drinking water from older plumbing systems that contain lead
- breast milk
- consumer products such as cheap jewelry or PVC blinds
- glassware or ceramics, especially if they were bought in another country
- lead solder used for a hobby

Exposure to lead has been linked to:

- lower IQ
- reading and learning disabilities
- disruptive behaviour in the classroom
- reduced ability to pay attention
- increased risk of antisocial and delinquent behaviour in childhood
- increased risk of criminal behaviour in adulthood

If you are concerned about your or your children's exposure to lead, speak to your doctor.

PCBs and ADHD

Polychlorinated biphenyls (PCBs) are industrial chemicals that were used for many years in electrical equipment, hydraulic systems, and other applications. They have been banned in the U.S. since 1976 and in Canada since 1977. However, they are very persistent, meaning that they stay in the environment and in the body for a long time. Children may be exposed to PCBs:

- before birth, as PCBs cross the placenta
- by drinking breast milk
- by eating fish and fatty foods that contain PCBs

Exposure to high levels of PCBs has been linked to:

- lower full-scale and verbal IQ scores
- attention problems
- memory problems

It is important to limit your exposure to PCBs by:

- following local guidelines for eating safe amounts of fish
- taking appropriate safety precautions if you are exposed to PCBs at work

Brain injury and ADHD

Brain injury from hitting one's head, also called traumatic brain injury, is associated with later problems with attention and learning. We still know very little about the relationship between traumatic brain injury and ADHD:

- It is not clear whether brain injuries can cause ADHD in children who were developing normally until they were injured. If this does happen, we would expect some differences from "ordinary" ADHD, because the child's brain would have been developing normally before the injury.
- Another possibility is that brain injury may cause existing attention problems to become worse.

Researchers are investigating these questions. As with many factors in ADHD, these questions are complicated by the fact that children with attention and behaviour problems are more likely to be injured in the first place.

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