
Babies Born to Moms Who Work with Solvents Studied

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A new study of children of women exposed to solvents on the job during pregnancy shows these children have poorer language, memory and attention skills, more hyper activity, and are more impulsive than children born to women who did not use solvents.

HISTORY. It has long been known that one solvent, alcohol, is associated with birth defects and developmental problems in children exposed to drinking mothers. Fetal damage can also occur when alcohol is inhaled either from alcohol-containing products that are abused (sniffing) or from using alcohol-containing products such as paints, shellacs, lacquer thinners, and inks. Many other solvents such as petroleum distillates, toluene, and acetone are also present in common products. It was assumed that adverse effects could be caused by much smaller amounts of these solvents because they are more toxic than alcohol. This assumption was borne out by animal studies which showed birth defects and delayed development in offspring of rodents exposed to solvents. The same effects were seen in infants delivered to mothers who abused solvents during pregnancy. However, not much was known about lower levels of solvent exposure on the job.

THE 1999 STUDY. The first study showing a connection between on-the-job solvent exposures and birth defects was published in the *Journal of the American Medical Association* (March, 1999, see *ACTS FACTS*, 5/99). The study followed the offspring of Canadian women employed as factory workers, laboratory technicians, artists or graphic designers, printing industry workers, chemists/painters, office workers, car cleaners, veterinary technicians, funeral home employees, carpenters, and social workers. The study found that "women exposed occupationally to organic solvents had a 13-fold risk of major malformations as well as increased risk for miscarriages in previous pregnancies."

THE NEW STUDY. A second Canadian study was published in the *Archives of Pediatrics and Adolescent Medicine* in October, 2004. This study, directed by Dr. Gideon Koren, founder of the Motherisk centre at the Hospital for Sick Children in Toronto, compared the children of women exposed to solvents on the job with children of women who did not work with solvents. The children of the solvent-exposed mothers were found to have poorer language, memory and attention skills, and were more hyperactive and impulsive.

THE SUBJECTS. Dr. Koren looked at 32 women exposed to organic solvents at work for at least eight weeks in their first trimester of pregnancy. The women's various occupations included graphic designers, a hair stylist, museum conservators, photo lab workers, and factory workers. These women were matched to a control group of women who

were not exposed to solvents and were of the same ages, IQs, incomes, and life styles. All of the women in both groups had mainstream jobs and were of the same socioeconomic status. None were exposed to lead, mercury, alcohol, legal or illegal drugs, or did heavy lifting.

EXPOSURE. The women's jobs did not involve excessive exposures. They were exposed to a total of 24 different common solvents or combinations of these solvents for periods of time ranging between 1 hour and 40 hours per week. All the women worked with solvents throughout their first trimester and some as long as 40 weeks. The average exposure of the women was for 28 weeks. Some of the women reported wearing respiratory protection and other protective gear.

THE EFFECTS. The children did not differ in birth weight or the age at which they reached developmental milestones. However, the children of women exposed to solvents, who ranged in age from 3 to 9 years old, had lower scores on a variety of language, memory, and dexterity tests than did the children in the control group. The exposed children also had lower behavioral and motor functioning scores and more attention and hyperactivity problems.

Although the children's IQs were not significantly lower, Koren points out that "A kid can be very smart, but if hyperactive he will not do very well." All the children were perceived by their mothers as doing well, but "still, when we compare them meticulously to a control group, there were changes that were quite clear and that could not be ignored..." Koren said. "These tendencies are at times more challenging to a child, and clearly, we think women should try to minimize their exposures."

COMMENT. It is possible that the increases in hyperactivity and attention problems seen in children today may be related to solvent-exposure. I have answered inquiries from pregnant women for more than 20 years and am convinced that many of them are exposed to significant amounts of solvents in beauty and hygiene products, paints and home improvement products, cleaners, and hobby and professional art materials. Researchers would be wise to fully investigate solvent exposure from common products used both at work and at home rather than assuming more esoteric environmental exposures are at fault.

Readers should note that some of the jobs held by the women in this study were related to art and theater work such as graphic design, photography, conservation, and hair styling. Although this is a small study and very preliminary, it should be followed up. In the meantime, ACTS councils avoidance of all solvents including alcohol during pregnancy whenever possible.

Sources: "Child Neurodevelopmental Outcome and Maternal Occupational Exposure to Solvents," *Archives of Pediatric & Adolescent Medicine*/ Vol. 158, Oct 2004, pp. 956-961; *The Toronto Star*, 10/5/04, p. A2 & *The Canadian Press*, 10/5/04, <http://www.cp.org/>.