

Most comprehensive study of mercury in dental fillings begins

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The presence of mercury in dental amalgams, or fillings, is relatively common knowledge; however, whether its presence affects the neurological system is a debate that has been ongoing for 150 years. A new study beginning in less than a week will – for the first time – study whether prenatal exposure to mercury vapor from fillings affects neurological development.

As part of the world's longest-running study of the health effects of low levels of mercury exposure, Gene Watson, D.D.S, Ph.D., an associate professor in the Eastman Department of Dentistry at the University of Rochester Medical Center, will begin an almost \$3 million, National Institutes of Health-funded study on prenatal exposure to mercury from dental amalgams or fillings. Watson will collect hair samples from children in the Indian Ocean island nation the Seychelles, who were enrolled in a study in 2001 to determine their exposure to methyl mercury from fish and other seafood. He will also record how many fillings the children have and how many and which surfaces of the teeth they cover as an indication of exposure to mercury vapor.

Because these children were enrolled prior to their birth, more information is available than any previous mercury/dental filling study. “This study can go back prenatally because we know what the mother’s dental history was prior to and during the pregnancy,” said Watson, who is also an associate professor in the Department of Environmental Medicine and the Department of Pharmacology and Physiology. “Little is known about detrimental effects of early exposure, and we need to

examine this because studies suggest the developing brain is more susceptible to mercury than the adult brain.”

Earlier studies on postnatal mercury vapor from dental fillings showed no significant effect on children’s neurological function. While comprehensive, those studies did not examine whether children may have been exposed through their mother’s dental work while still in the womb.

“Comprehensive studies like these are impossible without cross-departmental collaboration. Dr. Watson’s work will add another important layer to understanding the impact of prenatal exposure to mercury that he and the Eastman Dental Center are uniquely able to provide,” said Cyril Meyerowitz, B.D.S, M.S., chair of the Eastman Department of Dentistry.

This study expands on knowledge gathered in the Seychelles on the neurological effects of methyl mercury by a group of researchers at the University of Rochester Medical Center, including Philip W. Davidson, Ph.D., a senior investigator and professor of Pediatrics. The team has not found any ill effects of low level mercury exposure. Davidson said this new study is integral to further understanding the potential impact of all environmental exposures of methyl mercury.

“It’s the only study ever conceived where we’ll be able to look at exposure in the main ways people are exposed to mercury – fish and seafood, and dental amalgams” Davidson said. “No one has ever done this before.”

History

Mercury has been known to have detrimental effects on the nervous system for centuries; however, it wasn’t until an environmental disaster

in Minamata, Japan, that the world began to take notice of prenatal methyl mercury poisoning. In the mid-1950s, heavy mercury pollution in Minamata Bay contaminated seafood the community ate as a major source of food. Thousands of people were poisoned to varying degrees, and many children born of mothers who were exposed to methyl mercury were also affected – even if their mothers didn't show any obvious signs of poisoning themselves. The children's symptoms ranged from speech delay to mental retardation.

During a series of poor harvests in Iraq in the late 1960s and early 1970s, the Iraqi government bought cheap seed treated with a mercury-based fungicide to give to their people for farming. However, much of the seed arrived too late to be planted, so against orders not to eat it, the seed was ground and eaten. Thousands of people became ill. Much of the grain was dumped in ditches and beside rivers after it was pinpointed as the cause of the poisoning. From there, it entered the food chain again through poisoned fish and birds. As many as 20,000 people were poisoned and half of those died. The team at the University of Rochester Medical Center, including Gary Myers, M.D., a pediatric neurologist and a senior member of the team of researchers studying Seychelles, began its studies of mercury with this tragedy.

The two incidents together showed that levels of exposure that had little or no effect on a mother can seriously damage her fetus's developing brain and they inspired the University of Rochester team to find the ideal population to study prenatal exposure to mercury. The team chose Seychelles for two main reasons – the fish consumed there have an average level of mercury and mothers eat 12 meals of fish each week (much higher than the average American). Since 1989, 779 children have been followed and no adverse effects on developmental outcomes were attributed to prenatal exposure to mercury in seafood. Studies on these and other children in Seychelles are ongoing.

Source: University of Rochester

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