Another Look at Succimer

Cognitive Deficits May Be Reversible After All

Clinicians for years have used chelation to treat lead poisoning without knowing whether it prevented cognitive impairment in lead-exposed children. A recent study of chelation therapy now brings new hope to parents of children exposed to lead [***EHP* 115:201–209; Stangle et al.**]. The Cornell University study is thought to be the first to show that chelation can alleviate cognitive deficits caused by lead exposure. That finding contradicts the most comprehensive chelation study to date, in which scientists at the NIEHS found no cognitive benefits of the therapy.

Chelation's known effect is to cause lead and other metals to be removed quickly from the blood and excreted in urine and feces. The treatment originally was used to prevent death from toxic exposures. Today, though, with the phaseout of leaded gasoline, solders, and paint, nonoccupational exposures are at much lower levels, and typically come from lead-bearing paint and dust in old houses.

In young children, however, even low lead levels can cause learning disabilities, attention difficulties, and antisocial behavior. Clinicians use chelation in children to minimize that risk, despite uncertainties about its effects in this regard. Treatment is recommended by the CDC if the child's blood lead level exceeds 45 µg/dL. Yet a CDC survey showed many children are treated for levels as low as 10 µg/dL.

Succimer for success? A new rat study suggests that chelation may negate some cognitive effects of lead exposure.

The Cornell researchers tested the commonly used chelation drug succimer on juvenile rats fed lead doses that simulated moderate and high childhood exposures. For the lead-exposed rats, chelation was linked with an effective lessening of problems in cognition and emotionality, with a more complete normalization of behavior seen in the moderately exposed rats. An unexpected finding was that rats not exposed to lead but treated with succimer showed cognitive deficits similar to those of untreated rats with high lead levels during early development.

The authors believe that succimer might similarly improve cognition in lead-exposed children if a regimen could be identified that sufficiently reduces brain lead. Succimer's reduction of brain lead lags behind its effect on blood lead. The authors suggest that the failure of the NIEHS study to show any cognitive benefits of succimer may reflect the small reduction in blood lead—and even smaller reduction in brain lead—achieved by the treatment relative to placebo.

The Cornell team could not explain why succimer produced lasting adverse effects in rats not exposed to lead, but speculated it might be related to the drug's effect on essential metals such as iron and zinc, which are necessary for proper brain development. Their finding led them to warn against using chelation in children who do not have elevated tissue levels of lead or other heavy metals. **–Cynthia Washam**

Mapping a Course for PFCs

Transfer Between Mothers' Milk and Serum

Studies have found assorted perfluorinated compounds (PFCs)—the persistent chemicals in such products as nonstick coatings—in samples of human blood and milk, but what isn't clear is how efficiently the chemicals transfer between these two media. To address this gap, researchers in Sweden compared PFC levels in blood serum and milk samples to better understand the lactational transfer of these compounds [***EHP* 115:226–230; Kärrman et al.**].

Previous animal and human studies have shown that mothers can pass certain PFCs to fetuses and infants. That these compounds can find their ways into humans at the earliest stages is cause for concern because the PFCs perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA), which have infiltrated ecosystems from Asia to Antarctica, have been linked in laboratory animals to effects that include liver and testicular cancer, developmental defects, immune disruption, neuroendocrine effects, and birth defects.

The team collected milk and blood samples from 12 women at three weeks postpartum. The team also compared PFC levels from this relatively small sample to levels in human milk samples collected from 1996 through 2004 from groups of 25 to 90 women per year.

The team found eight PFCs in the current serum samples and five in the current milk samples. All of these milk samples contained PFOS (which was also the compound with the highest mean concentration) and perfluorohexanesulfonate. Some also contained PFOA, perfluorooctanesulfonamide, or perfluorononanoic acid. These patterns and levels were similar to those detected in the earlier milk samples.

The scientists calculated that the breast milk PFC concentration averaged about 1% of the corresponding maternal serum concentration.

Lactation equation. A new study shows that PFCs are transferred into breast milk at concentrations about 1% of maternal serum levels.

They write that the estimated levels of PFCs that infants received from mothers (about 200 ng per day) could represent a substantial exposure, and call for further studies of the potential hazards of PFCs in breast milk.

They also found that the relationship between serum and milk PFC levels depends on the specific compound. These differences, the scientists caution, may not necessarily indicate the efficiency at which the different compounds travel from whole blood to milk. Variables such as how readily each compound concentrates in blood plasma rather than whole milk may affect the ratios. **–Scott Fields**

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