Fact or Fiction?

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New Report on Toxins

In late January 2003, the Centers for Disease Control (CDC) released one of the most important government reports you never heard of, *The Second National Report on Human Exposure to Environmental Chemicals*, to modest fanfare and media attention, says Steven Hayward.[1]

This is the second report in this series. In March 2001, CDC released its first report which included data on 27 chemicals in samples from 1999-2000. The second report contained data on the 27 chemicals listed in the first report and 89 new chemicals. Included in the first report were data on lead, mercury, cadmium and other metals; diaklyphosphate metabolites of organophosphate pesticides; cotinine and phthalates. The second report includes data on these and adds the following: polycyclic aromatic hydrocarbons (PAHs), dioxins, furans, and coplanar polychlorinated biphenyls (PCBs) non-coplaner PCBs, phytoestrogens, selected organophosphate pesticides, organochlorine pesticides, carbamate pesticides, herbicides, pest repellents and disinfectants.[2]

An important feature of these reports is that they provide reference ranges for exposure among the general U.S. population.[3] Some key findings are already evident. Levels of five heavy metals (mercury, cadmium, cobalt, uranium, and lead) are far below the threshold health risk. For the seven other heavy metals in the report (barium, cesium, molybdenum, platinum, thallium, tungsten and antimony), average exposure levels at the 90th percentile fell for five of the seven and rose slightly for antimony. Platinum was present at such low levels that it was undetectable.[1]

From 1991 to 1994, 4.4 percent of children between the ages of one and five had levels of blood lead greater than or equal to 10 micrograms per deciliter, which is the Federal actions level. This had dropped to 2.2 percent by the second collection period (1999 and 2000) suggesting that efforts to reduce lead exposure for children have been successful.[3]

The second report also shows a drop in exposure to environmental tobacco smoke. Median levels of cotinine fell more than 70 percent in roughly a decade.[2]

Seven different varieties of phthalate compounds were tracked. Four were at such low levels in urine samples they were undetectable, while of the remaining three, two showed slight declines, while only one (monethyl phthalate) showed an increase. The study also screened for 40 different PCB and dioxin compounds. In almost every case, levels in human samples were below the detection level.[1]

Concerns

Anyone concerned that they may have been excessively exposed to an environmental chemical can compare their levels to standards listed in the reports. However, here's the rub.

As Ken Sexton and his colleagues point out, "It is important to remember that detecting a chemical in a person's blood or urine by itself does not mean that the exposure causes disease. Separate scientific studies in animals and humans are required to determine which levels are likely to do harm. For most chemicals, toxicologists simply don't have this information."[3]

Here's what concerns me about these reports. Just the fact that some chemical or metal is found will cause alarm for some people. They don't stop to look at the concentration levels. Just the fact that the offending item is there is enough to set off alarm bells.

Some Examples

Matthew Wilkinson, the toxins policy officer of a UK environmental pressure group, had this to say after he and others had been found to have a variety of chemicals in their bodies: "Our point is that every single person tested had detectable levels of these chemicals. It's not just concentration, it's whether it's there or not."[4]

Norman B. Berger, a Chicago based attorney who specializes in environmental litigation, had this to say about dioxin:

"Dioxin is a highly toxic compound. When they measure it in parts per trillion, that shows you how dangerous it is." This statement speaks wonders for itself. Once scientists start analyzing in the parts per quadrillion range, and in some cases this is already being done, Berger will be able to find many more agents to be concerned about.[5]

One last example: John Vidal was part of a group of 150 people who had their blood tested for organochlorines, PCBs and flame retardents. Indeed, he had all three chemicals in his body at concentrations in the part per billion range. The doctor looking at his results said, "My advice is go organic. It's the best way to clear your system and to protect yourself and others. You never know what's out there."[6] Talk about misguided advice! Apparently no one has told the doctor about "organic." Bugs, fungi, and weeds don't know the difference between crops. Furthermore, all food, "organic" or not, contains a variety of natural cancer causing agents such as acetaldehyde, acrylamide, aflatoxin, allyl isothiocyanate, aniline, benzaldehyde, benzene, benzo(a)pyrene, benzofuran, benzyl acetate, caffeic acid, catechol, coumarin, 1,2,5,6-dibenz(a)anthracene, estragole, ethyl alcohol, ethyl acrylate, ethyl benzene, ethyl carbamate, furan and furan derivatives, furfural, heterocyclic amines, hydrazines, hydrogen peroxide, hydroquinone, d-limonene, 4-methylcatechol, methyl eugenol, psoralens, quercetin glycosides, safrole.[7] There are more, but by now I think you get the point.

The CDC plans to release future reports that document their biomonitoring efforts

every two years. As Steven Hayward notes: "While we need several more years of data to resolve questions about many chemicals, the early results suggest that fears of human exposure to chemicals are exaggerated and unwarranted."[1] I hope he's correct and that the alarmists don't jump on every minuscule concentration that's found, without looking at concentration levels.

References

1. Steven F. Hayward, "A Blow to Chemophobia," American Enterprise Institute, February 25, 2003.
2. *Second National Report on Human Exposure to Environmental Chemicals*, Department of Health and Human Services, Centers for Disease Control and Prevention, January 2003.
3. Ken Sexton, Larry L. Needham and James L. Pike, "Human Biomonitoring of Environmental Chemicals," *American Scientist*, **92**, 38, January-February 2004.
4. Steve Connor, "Scientists discover toxic cocktail in our bodies," independent.co.uk, November 25, 2003.
5. Jeremiah Settler, "Where some see villain, others see bad fiction," *The Saginaw News*, April 4, 2004.
6. John Vidal, "Toxic Shocker," *The Guardian*, October 28, 2003.
7. Terrence Fullerton, "The Organic Hoax," Agro Services International Inc., October 29, 2003.

Advice & Counsel

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that the parts be re-extracted a second time to prove that all of the hex-chrome was extracted.

The leached water is acidified and treated in a similar manner as described in the GM procedure. However, the color developed is not visually compared. It is measured using a spectrophotometer calibrated with standard solutions.

ISO 3613:2000(E):

The ISO specification is similar to the GM specification, except that:

a. Leached parts are rinsed above the beaker.
b. 3 times as much acid is added to the test sample prior to color development.
c. The leach water is transferred to a 250 mL volumetric flask.
d. 3 mL of the diphenylcarbizide solution is added for color development.
e. 2 minutes after addition of the diphenylcarbizide, 25 mL of a buffer solution (55g di-hydrogen orthophosphate monohydrate in 100 mL water) is added before diluting the liquid to 250 mL.
f. A calibrated spectrophotometer is used to quantitate the hexavalent chromium

It would be nice if we all could agree on a procedure. In the meantime, the above illustrates the need for you to obtain guidance from your customer as to which procedure is to be used.