

Chemicals — The forgotten pieces of the EHS puzzle

by Gunni Nordström

A study of people with electrical hypersensitivity shows elevated levels of brominated flame-retardants in their blood, compared to a control group.

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The first, and so far only, study of chemicals in the blood of people with electrical hypersensitivity (EHS) was published in 2008. The results were published in the scientific journal *Electromagnetic Biology and Medicine*, by professor Lennart Hardell and colleagues at Örebro University, Sweden.

It's a small, but important, pilot study, which found increased levels of chemicals in the blood of people who had been sick with EHS for an average of eleven years.

Since the research on EHS has been dominated by the radiation issues, we can only speculate what the blood levels were in those people who got sick already in the late 1970s. It was not common to have computers at home in those days and researchers would have had much easier access to unexposed control groups. The first EHS epidemic among office personnel had been much simpler to investigate than what is possible today. What we know is that the amount of brominated flame-retardants in office electronics was dramatically increasing around that time.

Some technical people, such as Clas Tegenfeldt and Martin Andersson, were active in the debate already in the 1980s and kept some of the old computer terminals for future documentation. But, only a group of chemists at the Institute for Working Life (Arbetslivsinstitutet) seemed interested in finding out what chemicals were in the electronic equipment. They found that computer equipment offgassed organic phosphates of a kind that can cause allergies.

The Institute for Working Life was closed and the chemists moved to the University of Stockholm. There they never received any support when they

applied for grants to continue their studies of the chemicals in electronics and their possible health effects in office workers.

The only study of its kind

One might say that it was twenty years too late that the Hardell group examined the blood from people who are electrohypersensitive, but the study is unique and worth more interest than it has received.

The Örebro study only includes 13 persons with “self-reported electromagnetic hypersensitivity” and 21 controls. There were originally 20 people with EHS in the study, but seven were omitted for various reasons — one due to non-Hodgkins lymphoma cancer.

The study found that the EHS group had significantly higher levels of the flame-retardant BDE 47 in their blood. BDE 47 is a part of the PBDE (polybromine difenyle) group of brominated flame-retardants, which are commonly used in electronics, such as computer equipment.

It is noteworthy that BDE 47 was rapidly increasing in breast milk during the 1980s. We know that there were many office workers at that time — and most of them were young women in their childbearing years — who started working with the new technology. They were thus exposed to various long-lived hormone-disrupting chemicals, which today are a worldwide concern.

Women who were nursing their babies were relieved of some of their chemical burden through their breast milk, but some complained about acute symptoms which various experts explained away as just being psychological. One example was the carbonless copy paper, which was used even before the computer revolution. Carbonless copy paper contained PCB, which is chemically similar to PBDE.

The Örebro study found that the EHS group had higher levels of PCB 153 in their blood than the control group.

The BDE 47 content in breast milk leveled off by the end of the 1980s due to the chemical industry voluntarily phasing the chemical out. But other PBDE variants increased instead. There was at this time a lively debate in England and the United States about the increasing miscarriages and other unusual health problems among women in the electronics industry. This debate did not take place in Sweden.

Today, women's breast milk still has much higher levels of environmental toxins than any other kind of food.

Follow-up study needed

The body mass index was recorded for all the persons in the Örebro study, since the chemicals tested for are all stored in the body fat. All the test subjects were also asked about the types of food they ate, such as how much fish they consumed. The EHS group was also asked about how their illness started. Most had become sick using the old CRT type of computer screens and/or fluorescent lights. People in the group have had EHS for anywhere from one to nineteen years, with an average of eleven years since the onset.

The study was double-blinded, which means the researchers analyzing the blood samples didn't know which group they came from. The Swedish EHS patient organization, FEB, contributed to the cost of the research with a modest sum.

Lennart Hardell is the first to regret that this study was not done earlier. It was only due to his personal interest that it was even done. He emphasizes that it is not possible to draw conclusions on whether chemicals cause EHS:

. . . but the study could certainly form a basis for a larger and more thorough study. It could be interesting to look at this group in a more controlled setting and with a larger material, especially the possible interaction between various environmental factors, such as chemicals and electromagnetic fields. But we never got any funding for further research.

One of the scientists behind the study is professor Bert van Bavel, who is laboratory director at the *Forskningscentrum Människa Teknik Miljö* (MTM) at Örebro University. He primarily researches how humans absorb environmental toxins, such as PCB and dioxins. He says that in the future the tests for environmental toxins will be cheaper and faster. Hitherto it has been the cost of the lab tests that has made it difficult to go beyond the small pilot studies.

He emphasizes that there is a large need for research in this area:

Even though the PBDE levels have started to stabilize, we still find BDE 47, BDE 99 and BDE 153. It is worrisome that we see

relatively unknown brominated compounds replacing PBDE, though they seem to have similar effects.

Professor Åke Bergman of the University of Stockholm was in 1996 one of the first in the world to detect brominated flame-retardants in human blood. Many people with EHS contacted him to have their blood tested. Scientists thought that these compounds could disturb various hormonal systems in the body, such as blocking the thyroid hormone thyroxin.

One of the people who took these observations seriously was Britt-Marie Rosell, who for a time was the leader of a regional EHS organization (FEB-Väst). She was not satisfied just knowing she had these chemicals in her own blood. Twice she sent questionnaires to the 250 members of FEB-Väst. Many members responded back that they were aware of chemical exposures, which might have contributed to their becoming sick with EHS.

Britt-Marie Rosell published a report with her findings in 2000, which deserves to be better known.

About the author

This article was first published in the 2013/2 issue of *Ljusglimten*, a publication of the Swedish EHS organization FEB (www.feb.se). The article is brought here in an English version.

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Sjuk av bildskärm, 1989, co-authored with Carl von Schéele

Fältslaget, 1995, co-authored with Carl von Schéele

Mörkläggning, 2000.

Her most recent book, *Mörkläggning*, is available in two translated editions:

The Invisible Disease (English)

Menaces Invisibles (French)

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