

Post-mortem studies test for dioxin levels in the Kingston area

Federal health authorities will soon be in a position to indicate whether a highly toxic form of dioxin found in the post-mortem tissue of an 82-year-old man from the Kingston area last year can be classified as a fluke or a possible sign of contamination of people living in the Great Lakes region.

Traces of 2,3,7-8 TCDD, dioxin were found in tissues taken from the unidentified man who died at Kingston General Hospital.

2,3,7-8 TCDD is the deadliest substance made by man. It takes one two-hundredths of a drop to kill a 70-kilogram (154-pound) man. It takes much less, although experts can't agree on a figure, to increase the risk of cancer and possible reproductive problems.

Analysis of seven other tissue samples supplied to the Department of National Health and Welfare by the hospital at the same time were negative. But the one positive result led to further dioxin analysis in 16 other tissues samples — eight from Kingston and eight from Ottawa, which has a different water supply.

The results of the second cadaver study, which should be released within the next three



weeks, are important because they indicate the extent to which all chemicals accumulate in the body.

But the dioxin aspect of the study took on added importance after Ontario Minister of Environment Keith Norton told the provincial legislature over a week ago that three samples of untreated water taken from the Niagara region had minute traces of dioxin.

Further analysis is required, Norton said, to learn whether the dioxin found in the water is the notorious TCDD. It is only within the last five years that equipment has become sensitive enough to measure dioxin in low levels — parts per trillion and in parts per quadrillion.

But Margherita Howe, of Op-

eration Clean-up Niagara, says TCDD is known to be leaching from chemical dump sites in the Niagara area. In 1978, hundreds of people evacuated their homes at Love Canal on the U.S. side when dioxin was found to be leaching from the Hooker Chemical dump site there.

"I felt it (dioxin) was in the drinking water but I was amazed they've (the ministry) maintained it is not," she said in an interview this week.

Howe says she was earlier told that levels of TCDD in water would be so low "that instruments were not going to be capable of detecting it in my lifetime or my children's lifetime."

Until last summer, when the provincial government spent over \$2 million to pipe water from St. Catharines, the drinking water in Howe's town of 3,500 people, Niagara-on-the-Lake, came from the Niagara River.

Howe's stance, and that of a Pollution Probe report released this week in Toronto, is that the best technology available should be installed for all suspect Lake

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Ontario drinking water.

"They are still maintaining that the water (in Lake Ontario) is safe to drink and yet they don't really know."

Norton told reporters it was significant that no treated filtered water showed detectable traces of dioxin. TCDD showed up in three of 175 samples of raw water from the Niagara River and Welland Canal. The theory is now that TCDD attaches to particles in the water and may be filtered out.

NDP provincial environment critic Brian Charlton disputes the theory, partly because a Ministry of Environment study last summer in Toronto harbor showed all chemicals are not filtered out by the existing system. The other problem, says Charlton, is that the plethora of other chemicals in Lake Ontario may interact with TCDD.

"Dioxin may be the prime concern at the moment but there are 460 chemicals known in Lake Ontario," agrees Charlton. "Right now, there are guidelines for 42 chemicals."

Still, the untested theory that TCDD attaches to particles in the water rather than sediment at the bottom may provide a partial answer on how the contaminant spreads. "That means the potential of movement of contaminants from the Niagara River right across Lake Ontario is far greater than the ministry (of environment) had been admitting to," Charlton said.

The spread of contaminants from the Niagara region to areas like Kingston has been part of the ongoing controversy since dioxin was first discovered in herring-gull eggs in the late 1970s. The fact that some of the highest levels were recorded in the Kingston area has led to speculation that some local source might be responsible.

In 1981, an independent researcher also found signs in the Bay of Quinte area of an increase in stillbirths from in the early 1970s, a discovery which brought promises of a study of the area from the Department of National Health and Welfare.

At about the same time in 1981, both Canada and the United States reported dioxin had been found in lake fish. Federal guidelines followed restricting fish for sale to 20 parts per trillion in 1982. Pregnant women and young children were advised not to eat fish taken from the lake. Others should restrict consumption.

One fish, an 18-inch lake trout found in the west end of the lake, contained levels above 20 parts per trillion.

Gull eggs and fish are seen as indicators of TCDD because it accumulates in the fatty tissues in a similar way to DDT, PCBs, mirex and mercury.

Because of bioaccumulation, a National Research Council report on dioxin in 1981 warned of greater danger in people gradually accumulating TCDD through eating fish than through drinking water. The report, which indicated the 20-parts-per-trillion limit set for fish may be too high, also indicated that dioxin appears to be a widespread contaminant.

Norton and other government officials have downplayed the significance of the low levels found in the water. A person, said Norton, would have to drink 20,000 litres of water a day with the levels of dioxin found in the Niagara River to have a toxic effect.

The level of 20 parts per trillion for fish, Allen Johnson in the Ontario Ministry of Environment fish monitoring program told The Whig-Standard, is based on someone eating fish once a day for 70 years having a one-in-100,000 chance of cancer. The same risk level comes from smoking two cigarettes a year, he said.

But it is also true that dioxin has been part of a scientific debate in the United States and Canada on whether a "safe dose" is possible. In 1980, the Environmental Protection Agency in the U.S. said simply that no level is safe for humans. That decision is under review, a process that some critics credit more to Reaganomics than human health. Defenders say the review is due to faulty methods in setting the original U.S. guidelines.

Dr. George Becking, chief of environmental toxicology at National Health and Welfare in Ot-

tawa, says scientists have moved from the position that "even a molecule of TCDD" was seen to create a risk of cancer.

"The problem is not one that (means) we should be digging our bomb shelters and that we are all going to die from this horrendous compound," Becking said in an interview this week.

Becking says if science can set guidelines for other chemicals, it can come up with guidelines for dioxin. "Dioxin is reasonably well established with toxicity patterns. . . . If we can do it for saccharin, if we can do it for other food additives, we should be able to do it with dioxin."

He says it is a matter of scientists sitting down and reviewing the data.

But Charlton calls it "simplistic" to look at dioxin in isolation from the pot pourri of chemicals in Lake Ontario.

One of the unanswered questions with all chemicals is the synergistic effect. What happens when two chemicals are combined? Is the effect greater than in isolation? What happens when 460 chemicals known to be in Lake Ontario are combined?

"I couldn't say yes, (dioxin) acts synergistic and I couldn't say no. We don't know," Becking said. It will likely be years before researchers come close to an answer.

However, the toxicity of TCDD, produced as an unwanted byproduct in the manufacturing of wood preservatives, some pesticides, and industrial chemicals, has been extensively studied because it was contained in Agent Orange, used to defoliate trees in Vietnam. Veterans were later found to be suffering health effects — skin rashes, personality disorders, swollen livers, and reproductive problems.

An accident in the industrial area of Savasso, Italy, in the mid-1970s sent several pounds of concentrated dioxin into the air. Widespread disease developed in nearby villagers. The area is now permanently fenced off.

Until the mid-70s, TCDD was also used in weed-control sprays throughout North America. Farmers and people sprayed with such substances have also charged health damage.

Less is known about the risk of lower-level, long-term exposure. In the late 1970s, Dow researchers produced a controversial report that dioxins have long been a part of the natural environment and are produced by combustion of woodfires, municipal incinerators and cigarette smoke.

Into the numbers game of how much dioxin is actually created annually and what constitutes a safe dose, comes the economic recession for people on all sides of the issue.

Howe says she believes the Environmental Protection Agency has "written" off the one million people living on the U.S. side of the river and that means, despite diplomatic notes and threats from Canadian Environment Minister John Roberts, that the companies involved will not be charged with the gigantic multi-billion dollar task of cleaning up dump sites. "When you talk to people on the other side of the river, they are inclined to feel that they are living in a bloody cesspool and they just don't see much happening."

She adds, "With the recession they (the people) almost have to choose their jobs or their health and their children."

And, Becking says, there is the bottom line of money to continue research on health effects. Testing of post-mortem tissue samples from the Niagara region is on the books but funds are not actually committed. There's a range of estimates on the actual

cost, but it lies somewhere between \$1,000 and \$3,000 per human tissue sample. A single fish analysis, where dioxin is more easily detected, is about \$500.

The other problem is donors. "One of the problems we have is finding sources of human tissue that we can use in that kind of study," said Dr. Peter Toft, head of criteria and selection at Health and Welfare.

The testing of samples from Kingston and Ottawa instead of Niagara was largely because Kingston and Ottawa hospitals were the first to sign the agreement to supply tissue samples.

It should be added that privacy legislation protects the donor and family to strict terms of confidentiality. Hence, if federal authorities have any idea how a Kingston resident might have been in contact with dioxin, through occupation or lifestyle, such information would not be released since it might assist outsiders to identify the donor.

However, at the time of the first finding, Norton said the 82-year-old man did not use the lake as a supply of food. Norton also said the man had died of pancreatic cancer, a fact officials say is unrelated to the low-level dioxin finding.

Further dioxin testing on tissue, said Toft, "depends on what we find. If there's nothing in the next 16 tissues, the single occurrence would be a fluke."

But NDP critic Charlton says there shouldn't be further testing before movement is made to improve filtration of drinking water. "If and when dioxin reaches a level that it's absolutely clear that it's getting into people's drinking water, it's one to three years to put in place the filtration technology. They should be proceeding with upgrading now."

And this week Pollution Probe in Toronto added to the concern with charges that the drinking water of Lake Ontario is unsafe because of the vast number of contaminants. The environmental group urged that better filtration systems be installed along the Great Lakes. Some countries in Europe have installed a carbon filter system for water purification.

If there is any good news in the anxiety surrounding TCDD, it is that herring-gull eggs preserved from the 1970s from an island off Prince Edward County were found to contain 200 to 1000 parts per trillion. Similar analysis of 1980 eggs showed a significant decline to 50 to 70 parts per trillion. Still, there are also questions raised that the long-term storage of eggs may affect levels found.

Fish samples from those early years are not available so there is not enough data over the past three years to firmly establish trends, Johnson said. However, a spottail shiner, a minnow which stays close to the point of hatching, is proving to be a good indicator of TCDD presence. Sure enough, the highest levels recorded in the latest 1981 samples were near the Love Canal. The fish, caught when they are three and six months, had already accumulated 59 parts per trillion in Cayuga Creek adjacent to Love Canal. Near Fort Erie, it was 15 parts, and at Niagara on the Lake, 13.5 parts per trillion.

It's true the Kingston area is serving as the current guinea pig for the people of the Great Lakes by supplying post-mortem samples. But the people of Niagara, living in the most contaminated area of the world, can be forgiven for feeling they are real live guinea pigs for the rest of us.

Howe says it would be "ludicrous" if testing for dioxin on post-mortem samples ended in Ottawa and Kingston.