PCB clipping #6

Decline Noted in Male Sperm Count; Chemicals in Environment Are Cited

By Bil Richards
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A Florida chemist said yesterday that the sperm count and potential fertility of American males appear to have declined sharply in recent years.

Part of the reason for the lowered sperm count, Dr. Ralph Dougherty told the American Chemical Society's annual meeting here, is the presence of toxic chemicals in the environment.

Dougherty, professor of chemistry at Florida State University, said that 23 percent of 132 college student volunteers who contributed sperm samples for his study showed up as functionally sterile.

In a similar study done in 1929 on 271 men, researchers found that half the samples registered densities of 80 million sperm or more per milliliter of fluid, Dougherty said. In the Florida State study last year, the median sperm density had dropped to 60 million per milliliter.

Dougherty also reported that the study in 1929 showed that men in the largest single group within the test sample had 100 million sperm per milliliter of fluid. A study in 1973 showed that men in the largest single group had dropped to a density of 80 million sperm per milliliter of fluid.

In the Florida State study, which was funded last year by the National Institute for Environmental Health Sciences, the single largest group had dropped to a density of 20 million sperm per milliliter, said Dougherty. At that level, he said, a male is generally believed to be sterile.

About 25 percent of the decline in the sperm count among the Florida test subjects appears to be linked to toxic chemicals called polychlorinated biphenyls (PCBs) which were found in the samples, Dougherty said.

PCBs were banned by federal law in 1976 but experts estimate some 70 percent of the compound that had been produced by the time of the ban is still present in manufactured goods or the enviroment.

Dougherty suggested that other factors such as cigarette smoking, additional toxic chemicals and natural variations in sperm counts may also have contributed to the lowered densities.

"There are a number of unknowns which have significant negative correlations," he said. "Right now I just don't know what they are."

Dougherty acknowledged that marijuana smoking is likely to lower sperm counts. But he said that even if the students were marijuana smokers the overall effect on their sperm counts was "trivial."

According to Dougherty it is "entirely possible and likely" that the actual cause of a portion of the lowered sperm count is a little-known byproduct of PCBs called dibenzofurans (PCDF). On Monday, Dougherty and other researchers said PCDF can be as much as 1,000 times as toxic as PCBs. They said it has been found recently in fish from Lake Michigan and several major eastern rivers.

Dougherty said that several studies done in Europe and Japan suggest, but do not prove, that sperm counts there have also been decreasing. The only medical literature linking PCBs to a decline in sperm counts has been confined to animal tests, he said.

The Florida State research team plans additional sperm density tests on workers who manufactured electrical capacitors, in which PCBs are widely used as coolants and lubricants, Dougherty said.

In his report, Dougherty qualified his findings because of the small size of the test sample and because the subjects were college students. The researcher said the results of similar tests on non-student males might not be the same, he said, because college students are under heavier stress and are more active sexually than most other males. Both factors can be responsible for lowering sperm counts, Dougherty said.

In the 1929 study, he said, the sperm donors were husbands of pregnant women. The donors in the 1973 study were patients awaiting vasectomies. When the pre-vasectomy patients were analyzed their sperm samples actually showed a slightly lower density than the national average at the time, Dougherty said.

In addition to the traces of PCBs Dougherty said, the Florida State study showed a number of other toxic chemical compounds including DDT in the sperm samples.

Such toxic substances reduce the rate of cell division, he said. It requires at least eight cell divisions to produce a single sperm, Dougherty said, so substances that inhibit cell division will have a dramatic effect on sperm density.

In addition to cutting sperm density, Dougherty said, the same substances can cause cancer and birth defects.

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