Biomedicine

Kathy A. Fackelmann reports from Detroit at the annual meeting of the American Diabetes Association

Hypertension predicts diabetic eye-disease risk

Diabetics with high blood pressure face an increased risk of developing a potentially blinding eye disease called retinopathy, according to new research. The finding highlights the need for diabetics to get regular checkups and prompt treatment of hypertension.

Ronald Klein and his colleagues at the University of Wisconsin Medical School in Madison studied 891 people with Type I diabetes, who need daily insulin injections to help them convert sugar to energy. The researchers found that systolic blood pressure, the maximum pressure obtained when the heart beats, was a "significant predictor" of whether these patients would go on to suffer from retinopathy.

Diabetics with the highest systolic blood pressure readings—135 millimeters mercury to 221 mm mercury—at the start of the study were 1.8 times more likely to develop retinopathy during the next four years than those with systolic readings of 110 mm mercury and lower.

The study doesn't prove that hypertension causes retinopathy, but scientists speculate that very high blood pressure damages the tiny blood vessels of the eye. Retinopathy occurs when these vessels leak blood into the retina, causing blurry vision. Doctors can treat retinopathy in most diabetics. But in some advanced cases, the retina builds up scar tissue, causing a permanent loss of vision.

About 1 million Americans have Type I or insulin-dependent diabetes, the most severe form of the disease.

Diabetes peril for developing children

Traditionally, insulin-dependent diabetes has not been associated with impaired intellectual functioning in childhood. But very preliminary results of a three-year Canadian study hint that children who get Type I diabetes may have deficits in spatial or verbal skills.

Joanne F. Rovet and her colleagues at the Hospital for Sick Children in Toronto, Ontario, devised a three-year prospective study of 70 diabetic children enrolled within two months of diagnosis and 40 of their nondiabetic siblings. At the start of the study and then every year thereafter, they gave the children a battery of intelligence tests that measure spatial and verbal ability.

So far, 45 diabetics and 27 controls have completed the study. Analysis of the early data links the type of cognitive impairment observed to the child's age at the time of diagnosis. For children who get diabetes before their fifth birthday, the disease may affect parts of the brain responsible for spatial ability. Rovet and her colleagues found that compared with controls, these children performed poorly on tests measuring spatial skills. Children use spatial skills in such activities as arranging building blocks and solving arithmetic problems, Rovet notes.

For children older than age 5 at the time of diagnosis, spatial ability seemed normal but the tests revealed verbal impairments. That finding suggests these children may have trouble learning new vocabulary words, Rovet says.

"Differences in age of onset and impairments observed," she says, "suggest the possibility of critical periods of brain development in terms of its sensitivity to the adverse consequences of diabetes." But these early results must be interpreted with caution, she adds. The last child to enter the study will complete the protocol in spring 1990, and the addition of later data may change the results.

Scientists still don't know whether the children's early spatial and verbal deficits will persist later in life. Researchers must study diabetic children over longer periods of time to find out if they have trouble in school or, as adults, with tasks such as map reading or parking a car, she adds.

Science & Society

Microbes recruited in Valdez cleanup

Just after midnight on March 24, the *Exxon Valdez* supertanker ran aground in Alaska's Prince William Sound, spilling 10.1 million gallons of crude oil and fouling 368 miles of shoreline in that sound alone. Roughly 2,500 people have already enlisted in the manual cleanup of area beaches and wildlife. But the newest recruits in the cleanup are local communities of bacteria that specialize in detoxification.

Last week, Environmental Protection Agency scientists began seeding six oil-stained beach plots with nitrogen and phosphorus fertilizer in a 2-acre experiment at Alaska's Snug Harbor. Previous studies had detected air-breathing bacteria in Prince William Sound and nearby beach waters with the ability to break down slowly volatilizing alkanes (straight-chained compounds) and simple aromatic (ring-shaped) hydrocarbons. Together, these compounds represent about half the oil left on the beaches. Moreover, says EPA's Hap Pritchard in Valdez, Alaska, they account for most of that oil's toxicity.

The 90-day test will compare two nutrient formulations aimed at spurring the yet-unidentified bacteria's growth and alkane/aromatic degradation. One formulation incorporates oleic acid, best known as the primary fatty acid in olive oil. Researchers conducting the test think this "fat" will glue the mixed-in bacterial nutrients to any crude oil on which they're sprayed. The other formulation is an off-the-shelf fertilizer "brickette." The researchers are packing several brickettes into biodegradable plastic sacks and tying the sacks to pipes anchored in the beach. Over the course of a month, they expect wave and tidal action to flush the slowly dissolving fertilizer back and forth across the shoreline's rocks and sand.

The team will use its preliminary data, available by early July, to determine whether either formulation offers enough promise for widespread treatment of Alaska's beaches. Neither regimen, however, can restore affected beaches to their former, nearly pristine state. Because these bacteria ignore asphalt-like oil constituents, a tarry residue will remain.

NAS suspends collaboration with China

The U.S. National Academy of Sciences (NAS) is "shocked and dismayed by the action of Chinese government troops against peaceful demonstrators in Tiananmen Square and elsewhere in Beijing, with such great loss of life," NAS President Frank Press said in a telex to Chinese officials last week. "While we earnestly hope to maintain our cooperation with ... Chinese institutions," he added, "we must suspend all activities for the time being. We do so in outrage and sadness."

According to Robert B. Geyer, who heads NAS' China office in Washington, D.C., those most strongly affected by the NAS action are 35 U.S. nationals in China — a mix of doctoral candidates, postdoctoral scholars and other researchers who are there for short-term teaching stints. The number probably would have been much higher, he says, had the action not occurred at the end of a school year.

All of these individuals have been "strongly urged" to leave China, Geyer says. Because some are field researchers in remote areas without phones or firm mailing addresses, only half have confirmed receiving that urging. One individual has announced an intention to ride out this uncertain period. The four or five Chinese scholars visiting the United States through NAS exchanges, and the two or three more scheduled to arrive soon, are welcome to stay, Geyer adds.

NAS' cancellation of a biotechnology conference in Shanghai earlier this month was the first scientific casualty of the Chinese political tensions. The next likely victim is this summer's expedition by U.S. social, agricultural and environmental researchers collecting data for the third year of a five-year field project in the rural Shandong province.