

The baffling case of an AIDS-like malady

Reports presented at the VIII International Conference on AIDS last week raised the possibility that an unidentified virus causes an AIDS-like illness in some people. Now, a California researcher says he has found hints of such a virus in one woman who is afflicted with this mysterious syndrome.

The U.S. Centers for Disease Control (CDC) in Atlanta previously had identified six cases of the strange illness; doctors attending the AIDS conference in Amsterdam described others, bringing the total to several dozen cases, says CDC's Harold W. Jaffe. Like people with AIDS, those with the mystery illness show signs of a damaged immune system and develop opportunistic infections such as *Pneumocystis carinii* pneumonia. However, they all test negative for HIV-1 and HIV-2, the two viruses known to cause AIDS.

The anecdotal accounts of an AIDS-like syndrome that surfaced at the Amsterdam conference prompted the early release of research findings by Sudhir Gupta, chief of immunology at the University of California, Irvine, and his colleagues. Gupta's team studied a 66-year-old woman with sharp declines in her CD4 T-lymphocytes, a type of white blood cell targeted by HIV-1 and HIV-2. This woman showed no sign of either virus but suffered from *P. carinii* pneumonia. The research report will appear in the Aug. 15 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES.

To unravel the puzzling case, the researchers first drew blood from the woman and isolated white cells of various types. Next, they took healthy white cells from other sources and added them to white cells taken from the patient. In analyzing the fluid surrounding the cells, they discovered evidence that a virus infecting the patient's white cells had infected the added cells. The researchers call the virus "human intracisternal retrovirus."

Gupta and his colleagues found evidence of the same virus in the woman's 38-year-old daughter, who has an abnormally functioning immune system but shows no symptoms of pneumonia or other opportunistic infections.

The data suggest an association between human intracisternal retrovirus and the older woman's illness, Gupta told SCIENCE NEWS. However, the scientists don't have proof that this virus caused her illness or that of patients identified by other research teams. Establishing a cause-and-effect relationship will require a lot more work, Gupta says.

The 66-year-old woman received a blood transfusion a few years before her daughter was born, raising the possibility

that the virus spreads through exposure to tainted blood, he says. However, "I don't think there's any reason for concern at this stage about the safety of the blood supply," Gupta says, noting that the U.S. blood supply is carefully screened for HIV-1 and HIV-2.

Other U.S. research laboratories have been studying cases of the baffling AIDS-like syndrome. One such inquiry, at the Aaron Diamond AIDS Research Center in New York City, has turned up hints of an unidentified retrovirus in two of the four cases studied so far, says John Moore, an AIDS investigator at the center. The scientists don't know whether that retrovirus will match the one uncovered by Gupta's team.

For now, the scientific story about this illness is characterized by a spate of questions and very few answers. Anthony

S. Fauci, director of the National Institute of Allergy and Infectious Diseases in Bethesda, Md., points out that the preliminary reports of viral involvement may turn out to be false leads, perhaps caused by contamination of cell cultures or some other glitch.

"We're left with these hints that a virus is involved," Fauci says. "At this point in time, we really can't make any definitive statements."

Scientists don't really know whether the AIDS-like illness is caused by one virus, several viruses, or any infectious agent at all, Jaffe adds. The unidentified immune deficiency might represent a rare malady that has existed for a long time, yet received very little attention until AIDS researchers started focusing on the immune system, he points out.

— K.A. Fackelmann

Shuttle mission yields surprising results

Biologists may have to rethink traditional theories about how the human body functions in light of new results from experiments conducted on shuttle astronauts during last June's Spacelab Life Sciences-1 mission, scientists announced last week.

"It is now clear that we are obtaining a significant number of surprising results from this mission," says Ronald J. White, chief scientist in NASA's life science division in Washington, D.C. "The ideas the investigators had prior to the space flight about how the body actually would work in space were either incomplete or incorrect."

Some of the most important findings relate to the detailed workings of the cardiovascular system. "One of the major concerns regarding the body's adaptation to space flight is that the adjustments the cardiovascular system makes during flight to maintain blood pressure in weightlessness may compromise its ability to readjust to gravity upon return," says David R. Pendergast, a physiologist at the State University of New York at Buffalo.

In a study presented July 24 at an American Heart Association meeting in Chicago, Pendergast and his colleagues found that cardiac output — the volume of blood pumped by the heart — increased 50 percent and remained elevated throughout the shuttle flight, even though heart rate decreased and mean blood pressure remained constant. "This type of regulation of blood pressure was completely unexpected," Pendergast says.

On the ground, cardiac output rises temporarily every time a person lies down. The physical effects of weightlessness resemble those of prolonged bed rest, so astronauts may feel weak or have difficulty standing for several days after landing. According to Pendergast, models for weightlessness based on bed rest studies predicted an initial increase in

cardiac output, followed by a decrease to normal levels within one to three days. Calculations of other cardiovascular variables showed that in space, unlike on Earth, the body maintains blood pressure by engorging organs with blood — a condition called hyperfusion.

While this condition does not affect people's ability to perform in space, it may contribute to their difficulties upon return, says Pendergast. The researchers quantified the physical extent of these difficulties by comparing three astronauts' ability to exercise before, during, and after the flight. They found that the cardiovascular system remained compromised for up to seven days after landing.

Unexpected results from a related experiment were announced at a NASA briefing the same day. Researchers from the University of Texas Southwestern Medical Center at Dallas monitored an astronaut's central venous pressure, a measurement of the filling pressure of the heart (SN: 10/5/91, p.220). They had expected the pressure to increase slowly as weightlessness released blood formerly pooled in the lower body, but instead they observed a sudden, dramatic decrease in pressure that lasted for the entire nine-day flight. "This was an enormous surprise for us," says Lynda D. Lane, senior research scientist on the project. She says the study underscores how much scientists still need to learn about the cardiovascular system.

Earthbound studies of the cardiovascular system are complicated by gravity, which exerts different pressures depending on whether a person is standing up or sitting down, says Lane. She looks forward to more shuttle-based studies "free from the aggravation of gravity."

Both research groups will continue their investigations in the next Spacelab Life Sciences mission, scheduled to fly next summer.

— K. Hoppe