

AZT lowers maternal HIV transmission rate

The drug AZT slashes the risk of mother-to-infant transmission of HIV, the virus that can lead to AIDS, according to clinical trial results released this week.

An independent panel reviewing data from the trial found a transmission rate of 8.3 percent when pregnant women and their newborn babies received AZT. This compares to a rate of 25.5 percent in a group of women and infants not getting the drug. That reduction prompted federal officials to halt the trial and offer AZT to all of the participants.

"This study clearly showed a rather dramatic beneficial effect," says Anthony S. Fauci, director of the National Institute of Allergy and Infectious Diseases (NIAID), which cosponsored the trial. Until now, there has been no way to shield the fetus from an HIV-infected mother.

The trial began in April 1991. U.S. and French investigators enrolled HIV-infected women in their 14th to 34th week of pregnancy. The women received either AZT or an inactive placebo during their pregnancy and labor. For the 6 weeks following birth, the newborns got either the AZT or the placebo they had been exposed to in utero.

The review panel analyzed preliminary data from 364 infants in the trial. The reviewers noted that 13 of the 53 HIV-infected babies had received AZT, the

other 40 a placebo. These results are statistically highly significant and therefore unlikely to be due to chance.

The investigators found no serious short-term side effects among mothers or their babies taking AZT, although some infants taking the drug experienced a mild anemia.

Federal officials say they aren't ready to formally advise all pregnant women or their newborn infants to begin AZT therapy. "Long-term follow-up of all children born to mothers in this study is essential to learn more about the risks and benefits of this treatment," Fauci says. Public health officials worry that in utero exposure to AZT might cause subtle neurodevelopmental abnormalities in children, a hazard that wouldn't show up for years.

At the same time, doctors should consider the potential benefits of AZT therapy for an HIV-infected pregnant patient, Fauci adds. NIAID sent that same message to physicians in a Feb. 21 alert.

The HIV-infected women in this trial were generally healthy and did not show the severe immune system problems that accompany AIDS, says study cochair Rhoda Sperling of the Mount Sinai Medical Center in New York City. Investigators don't know whether AZT would interrupt maternal HIV transmission in other cases, she adds. —K.A. Fackelmann

Mini tools for mini patients

For the first time, surgeons report successfully performing an operation in the womb using needle-size surgical instruments, including a tiny endoscope that makes possible video imaging of the inside of the amniotic cavity.

"We think perhaps this is . . . a new frontier in perinatal medicine," says surgeon Rubén A. Quintero of Hutzel Hospital at Wayne State University in Detroit. This procedure makes fetuses "true surgical patients" and may one day be used to repair birth defects, he asserts.

"The potential for this is enormous," agrees Steven Klein of the National Institute of Child Health and Human Development in Bethesda, Md.

Quintero and his colleagues performed the procedure, called operative fetoscopy, to tie a knot in the umbilical cord of an 18-week-old fetus that lacked a brain and heart and jeopardized the life of its healthy twin, they write in the Feb. 17 *NEW ENGLAND JOURNAL OF MEDICINE*.

The physicians used an instrument with miniature scissors and a grasper to tie the knot, he says. The fetoscope, an endoscope for fetal surgery, and ultrasound guided the surgeons. Quintero has since successfully repeated the procedure, he says. □

Global warming: Why is the planet feverish?

Scientists who search for signs of greenhouse warming resemble music lovers listening to a symphony. Trying to isolate the human influence from the tangled climate record is a little like attempting to distinguish the mournful call of a cello amid the complex chords of the orchestra.

But if researchers have any hope of predicting the climate, they need to learn how to separate the natural from the artificial effects that set the planet's thermostat. Two teams now report new insights into Earth's indigenous climate.

Michael E. Schlesinger and Navin Ramankutty of the University of Illinois at Urbana-Champaign detected hints of a natural pattern by studying the record of global average temperatures from 1858 to 1992. Earth has warmed by 0.5°C during this period, but researchers have long puzzled over the uneven rate of change. Temperatures rose quickly in the early third of this century, then leveled off from 1940 to 1975 before starting to climb steeply in the 1980s.

Climate experts suspect that rising concentrations of carbon dioxide and other greenhouse gases have caused some of the global warming, but they cannot explain what stalled that trend for 35 years. Schlesinger and Ramankutty may have an explanation for the unsteady rise. The two

used a sophisticated statistical technique to analyze the global record after first subtracting two major human factors: greenhouse warming and the cooling from sulfur pollution.

The remaining temperature changes display a natural oscillation with a period of roughly 70 years. When combined with the steady warming from greenhouse gases, this oscillation caused global temperatures to level off in mid-century. The researchers report their findings in the Feb. 24 *NATURE*.

Some scientists had previously suggested that the decade-to-decade variations within the temperature record stem from random fluctuations within the climate — the equivalent of white noise. Others blame the climate wiggles on the sun, suggesting that solar energy might wax and wane by a substantial amount over decades. But Schlesinger and Ramankutty's findings back a different explanation.

If solar or random fluctuations caused the temperature swings, they would affect both hemispheres. But the 70-year-long temperature oscillation appears only in the Northern Hemisphere, particularly in the North Atlantic.

This finding ties in with recent discoveries in oceanography, which suggest that

a major current in the North Atlantic plays an important climatic role. By speeding and slowing, this current alters the amount of heat shuttled from the tropics to the Arctic. Schlesinger and Ramankutty suggest that such oceanic changes powered the 70-year temperature oscillation.

The new findings have intrigued other researchers; however, they caution against inferring too much from a temperature record only 140 years long. "It's difficult to be very definitive about oscillations when you're talking about one that is half as long as the period of record," says James Hansen of the NASA Goddard Institute for Space Studies in New York City.

Whereas Schlesinger and Ramankutty focused on natural climatic variations, another recent study investigated whether greenhouse gases caused the recent temperature rise. Ronald J. Stouffer and colleagues from the National Oceanic and Atmospheric Administration in Princeton, N.J., used a sophisticated computer model to simulate a 1,000-year span of climate history. The model did not include the effects of greenhouse gas pollution. Although warming and cooling trends appeared in the simulation, none lasted as long as the observed temperature rise, the researchers report in the Feb. 17 *NATURE*. The results therefore suggest that the current warming stems from human influences or some other factor not in the model. —R. Monastersky