

Biomedicine

Mom's symptomless herpes threatens baby

Herpes can be deadly for newborns who acquire the viral infection from their mothers during labor or delivery. To complicate matters, only about 25 percent of adults with genital herpes display telltale symptoms (SN: 6/28/86, p.410). Seattle-based researchers have now tested a group of mothers during labor for asymptomatic but infectious herpes, and have reached some disturbing conclusions. Their data suggest that such screening will neither identify all women who risk passing the virus to their newborns, nor allow physicians to save infected babies from a devastating outcome.

Zane A. Brown and his co-workers at the University of Washington identified 56 women with active, asymptomatic herpes infections among the 15,923 laboring women tested at two local hospitals between 1984 and 1989.

Type 1 herpesvirus, the "oral" form usually associated with cold sores, rarely infects the genitalia. However, says Brown, "our data indicate that when it is present [in the genitalia], it transmits more readily [than Type 2] to infants." Three of the five women (60 percent) with Type 1 herpes infected their babies, compared with seven of the 51 women (14 percent) with active Type 2 herpes, the researchers report in the May 2 *NEW ENGLAND JOURNAL OF MEDICINE*.

The Type 1 infection almost never harms a newborn, Brown observes. In his study, all infants contracting Type 1 herpes developed normally. By contrast, one of the seven infants with Type 2 herpes died, and four developed disabling encephalitis.

"The really big risk of neonatal infection and damage or death occurs if a woman first acquires [Type 2] herpes late in her pregnancy," Brown says. And fully one-third of the mothers with asymptomatic herpes in this study were experiencing their first, or "primary," episode of this periodically recurring disease, he adds. Although the infected infants were identified within 24 hours of birth — far earlier than usual — and immediately treated with antiviral drugs, "we didn't significantly change the ultimate outcome," Brown says. "Kids with Type 2 disease got sick no matter what we did."

He notes another unsettling finding: Unlike most adults, infants carrying antibodies to the Type 1 virus did not contract a milder-than-normal version of the Type 2 disease.

Fortunately, the more serious, Type 2 virus "transmits reluctantly," Brown concludes. But transmission may occur in unexpected ways. He and his colleagues speculate that in eight of the babies with herpes infections, physicians may have unwittingly opened a portal for the virus by inserting electrodes into the fetus' scalp to monitor prenatal heartbeats.

A gold-plated test for Lyme disease

Current tests for Lyme disease detect the antibodies produced when a person's immune system responds to *Borrelia burgdorferi*, the tick-borne bacteria that cause the disease. But because some people are slow to make such antibodies, the test doesn't always provide an accurate diagnosis. If left untreated, Lyme disease can cause chronic arthritic symptoms.

Scientists have now developed a prototype test that directly spots bits of *B. burgdorferi*. Working at the Rocky Mountain Laboratories of the National Institute of Allergy and Infectious Diseases in Hamilton, Mont., the group created gold-tagged antibodies that home in on two of the bacteria's surface proteins. The gold enables scientists to image bacteria-binding antibodies in the blood with an electron microscope, thereby clinching the microbes' presence, the researchers report in the June *JOURNAL OF CLINICAL MICROBIOLOGY*.

David W. Dorward, who directed the work, notes that most medical laboratories lack the electron microscopes needed to conduct the new test. However, he says, the gold-labeled antibodies could be adapted for use in a routine diagnostic test.

Computers

Ivars Peterson reports from San Jose, Calif., at the Physics Computing '91 conference

Navigating the information swamp

The ubiquitous lab notebook, with its dog-eared corners, stained pages and scribbled entries, may one day give way to an electronic analog that permits not only the recording of data but also the sharing of information among researchers scattered throughout the world. Researchers at Baylor College of Medicine in Houston have developed a sophisticated, computer-based scheme, called the Virtual Notebook System, that allows its user to gather, organize and annotate information selected from a variety of sources.

With such a notebook, a medical researcher interested in the diagnosis of a certain ailment, for example, can readily assemble a package consisting of X-ray images, personal comments, citations, journal articles, news items, electronic-mail extracts and other relevant pieces of information. Moreover, the researcher can instantly share that information with others who use the same system, even if they are thousands of miles away. "You can even write in someone else's notebook," says Kevin B. Long, who directed the project.

Designed to facilitate collaboration, the system's key element consists of software that masks the underlying maze of computers and computer networks that often stands in the way of efficient and convenient communication among researchers working with different computer equipment. The Virtual Notebook System also incorporates a new programming approach for simplifying the indexing and retrieval of information stored in computers. A specially programmed, information-seeking computer — known as the Wide Area Information Server and developed under the direction of Brewster Kahle of Thinking Machines Corp. in Cambridge, Mass. — responds to requests typed in English. Users don't have to know exactly how to find the information they need; nor do they have to remember any special instructions to locate data.

Best suited for groups of researchers already linked by computer networks, the Virtual Notebook System may prove a crucial component of large collaborative efforts. Officials with the Superconducting Super Collider are investigating the system as a possible means of sharing and analyzing experimental data when the accelerator is eventually completed.

Exploring the virtual wind

Calculations of the direction and speed at which air flows past a complicated, three-dimensional object, such as an airplane, generate huge quantities of data. Conventional two-dimensional graphic images derived from these data often fail to convey the flow's complexity. Now, a team of researchers has assembled a primitive, prototype system for exploring such flow patterns, in effect allowing an investigator to step into and interact with a computer-generated environment.

Steve Bryson and Creon Levit of the NASA Ames Research Center in Mountain View, Calif., used commercially available components to create their prototype system, known as the Virtual Windtunnel.

Through computer graphics and special input devices, the system creates the illusion of being surrounded by a flow. The user looks through a boom-mounted device resembling a diver's mask, which contains two small television sets to produce a wide-angle, stereoscopic image. A computer tracks the viewer's head position and generates the appropriate views. The user also wears a flexible glove fitted with sensors to manipulate the image in various ways. For example, to visualize the direction of flow in a particular region, a researcher can use the glove to specify the starting point for a computer-rendered stream of smoke, and then walk around to see the resulting flow pattern from different angles.

"It puts the computations right in front of the researcher," Bryson says. "It allows real interaction with the data."