SCIENCE NEWS of the week

New Hepatitis Virus, Test Found

Researchers at a commercial biotechnology firm reported this week the discovery of a virus responsible for up to 150,000 annual cases of transfusion-caused hepatitis in the United States, plus millions more worldwide. Linked to what is currently called blood-borne non-A, non-B hepatitis, the new virus has been partially cloned, providing reagents needed to develop a rapid screening test for the nation's blood supply and a possible future vaccine.

Identifying the virus at least partially solves the medical mystery of what causes the 95 percent of post-transfusion hepatitis cases not caused by the previously known hepatitis viruses, including those called A and B. The new, unnamed virus appears unrelated to any known virus, says Edward E. Penhoet, president of the Emeryville, Calif.-based Chiron Corp. Chiron scientists, collaborating with researchers at the Centers for Disease Control in Atlanta, first cloned parts of the virus last year, but only released their results this week at a scientific seminar at the University of California at San Francisco.

Antibodies to the virus have been found in "a very high proportion" of the hepatitis-infected blood tested in preliminary studies, Penhoet said at a press briefing in Washington, D.C. He says the percentage of positive results varies with the population tested, adding he expects the screening test now in development to detect at least 80 percent of donated blood units that are infected with non-A, non-B hepatitis viruses. "We can't be sure at this time that the agent we have cloned is responsible for all the non-A, non-B blood-borne hepatitis . . . but we think it represents the bulk [of cases]," Penhoet says.

Chiron scientists have sequenced about half the virus' genetic code, and produced several recombinant proteins using the viral genome as a template. One of those proteins apparently is found on the surface of the virus, and is being used in a prototype test to detect the virus. The company, which has applied for patents on the process, expects a blood-screening test to be worth $44 million in the United States and $107 million worldwide annually. In addition, use of the technology for diagnosing patients would bring the company another estimated $130 million. Penhoet says he expects clinical trials to begin this year. Currently, donated blood is screened for hepatitis B, as well as for a liver enzyme used to nonspecifically indicate the presence in donors of some sort of hepatitis infection.

Chronic hepatitis develops in 30 to 50 percent of those with blood-borne non-A, non-B hepatitis, and 20 percent of chronic carriers go on to develop cirrhosis. Evidence also indicates chronic carriers have a higher risk of eventually developing primary liver cancer. According to Penhoet, discovering the virus should make possible the development of a vaccine to prevent the disease. Earlier efforts to isolate a virus from infected tissues were stymied by the virus' refusal to grow in tissue culture and the lack of convenient animal models. *— D.D. Edwards*

Human growth hormone treatment-leukemia link reported

Short-statured youngsters receiving human growth hormone treatments appear at increased risk of developing leukemia, preliminary data suggest. However, it is unclear whether treatment with hGH actually causes the cancer, a new report concludes, and the risk associated with the treatment is too small to warrant withholding the drug.

The hormone — purified from human pituitary extracts or mass-produced by genetically engineered microorganisms — is the only effective treatment for dwarfism caused by insufficient pituitary gland activity in the brain.

The new findings suggest that — compared to their age-matched, normal peers — growth-hormone-treated children have a two-fold risk of developing leukemia within four years after the completion of treatment. The findings are based on data presented by an international team of experts attending a two-day workshop in Bethesda, Md., last week. Recent reports of leukemia in five Japanese children treated with the hormone prompted the workshop.

"My sense of the risk is that this is minuscule compared to [the risk of] crossing town to go to the doctor to get checked," said panelist Louis Underwood at a briefing following the workshop. Underwood, a pediatric endocrinologist at the University of North Carolina School of Medicine in Chapel Hill, said he hopes the panel's conclusions "might counteract the fright" from earlier European reports suggesting the risk of hGH treatment is more substantial. Nevertheless, he says, many questions about the links between hGH treatment and leukemia remain unanswered, and further epidemiological studies need to be done.

The U.S. Public Health Service is currently gathering data from every U.S. patient who has ever taken the drug, according to Judith Fradkin, chief of the Endocrine and Metabolic Diseases Program Branch of the National Institute of Diabetes, Digestive and Kidney Diseases in Bethesda. That study is expected to be completed in 6 to 8 months. Of the 11 leukemia cases so far associated with hGH treatment worldwide, 3 occurred in the U.S. However, Fradkin notes, the data are complicated because all 3 of those patients also received head irradiation for brain tumors. Scientists are uncertain whether head irradiation increases leukemia risk.

According to the panel report, the risk of leukemia among hGH-treated patients is 1 per 21,000 patient-years, compared to 1 per 42,000 patient-years for untreated, normal individuals in the same age range. No data are available on leukemia rates among untreated, hypopituitary patients, leaving open the possibility the leukemia link may result from an underlying genetic condition associated with hypopituitarism rather than the hGH treatment. Alternately, the panelists say, either hGH itself or a contaminant in its preparation may be causing the additional leukemias.

Growth hormone derived from human pituitary extract has not been approved for treatment in the United States since April 1985, when its use led to several deaths from Creutzfeldt-Jakob disease, a rare, infectious neurological condition. The extract is still sold in Europe and Japan, but is now purified by a different process than was used in the U.S.

Recombinant hGH, currently sold in the U.S. and elsewhere, is made by Genentech of South San Francisco and Eli Lilly of Indianapolis, Ind. The new data show no correlation between leukemia rates and different sources of hGH, but were again complicated because some leukemia patients received both pituitary-derived and recombinant versions.

For now, concludes panelist Delbert Fisher of the University of California at Los Angeles School of Medicine, patients should be told that if there is an increase in risk from hGH treatment, it is small. Because no alternative exists, he says, it would be "inappropriate and unwise" to withold treatment from needy patients. *— R. Weiss*