Possible cause of common childhood leukemia found

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By Martin F. Downs

NEW YORK (Reuters Health) - Scientists have pinpointed one possible cause of acute lymphoblastic leukemia (ALL), the most common form of leukemia in children.

Many cases of ALL arise when white blood cells called B cells fail to mature and these immature cells overwhelm the mature ones, wrecking the immune system.

For this to happen, something must go wrong while B cells are being made in the bone marrow. But exactly what goes wrong has been a mystery.

Now the new study suggests that deficiency in a protein called SLP-65 might be a major cause of ALL. SLP-65 is one of many proteins needed for B cells to develop fully.

Dr. Michael Reth, of the Max Planck Institute for Immunobiology in Freiburg, Germany, and colleagues report the findings in the May 22nd issue of Nature.

For the study, the researchers injected mice with immature B cells lacking the SLP-65 protein. The mice developed a leukemia resembling childhood ALL.

But restoring the expression of SLP-65 prevented leukemia in the mice.

Some children with ALL also lack SLP-65, the study shows. The researchers looked at bone marrow and immature B cells from 34 children with the subtype of ALL known as pre-B. Sixteen of them had only minute traces of SLP-65 or none at all.

"The question now, of course, is how is this happening? And that we don't know," Reth told Reuters Health.

It's possible that at some point, the wrong pieces of genetic material are inserted while SLP-65 is being coded from a gene, which stops the process. But something must make that happen initially.

Reth said he suspects that a virus might be the initial cause. "Some virus -- we don't know which one -- may infect children," he speculated.

Viruses can cause "hit and run" mutations in genes, leaving no evidence behind. But it's only speculation at this point whether a virus causes a mutation that halts the production of SLP-65.

"It's not established at all," Reth said.

Another question left to be answered is what might cause ALL in children whose SLP-65 proteins are intact. Eighteen of the bone marrow samples studied had normal SLP-65 expression. Other genetic factors may be involved, according to Reth.

"It may be one, it may be several," he said.

Research into the root causes of ALL may one day yield new treatments, but for now, chemotherapy is the best hope for ALL patients. "This disease is one of the success stories of chemotherapy," Reth said.

Eighty percent of children with ALL are cured by chemotherapy.

SOURCE: Nature 2003;423:452-456.