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Experimental Treatment for Rare Soft-Tissue Cancer Shows Promise in Mice

Study looked at method for blocking key growth protein in malignant nerve sheath tumors

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MONDAY, Dec. 30, 2013 (HealthDay News) -- Blocking a key protein involved in the growth of a rare, incurable type of soft-tissue cancer may eliminate the disease, according to a new study involving mice.

Researchers from UT Southwestern found that inhibiting the action of a protein, known as BRD4, caused cancer cells in malignant peripheral nerve sheath tumors to die.

Malignant peripheral nerve sheath tumors are highly aggressive soft-tissue cancers, or sarcomas, that form around nerves.

"This study identifies a potential new therapeutic target to combat [malignant peripheral nerve sheath tumor], an incurable type of cancer that is typically fatal," study senior author Dr. Lu Le, an assistant professor of dermatology, said in a university news release. "The findings also provide important insight into what causes these tumors to develop."

The findings were published online Dec. 26 in the journal *Cell Reports*.

Although malignant peripheral nerve sheath tumors can develop randomly, about 50 percent of cases involve patients with a genetic disorder called neurofibromatosis type 1. This disorder affects one in 3,500 people. About 10 percent of those patients will go on to develop the soft-tissue cancer, according to the news release.

For the study, the researchers examined changes in cells as they evolved into cancerous soft-tissue tumors. They found that BRD4, which helps regulate gene activation, is produced at an abnormally high level in malignant peripheral nerve sheath tumor cancer cells. In turn, this causes another protein, known as BCL-2, to prevent cancer cells from dying.

When researchers inhibited BRD4 in the mice, either genetically or with a drug called JQ1, the tumors got smaller.

"These treatments suppressed tumor growth and caused the cancer cells to undergo apoptosis, or cell death. This is why BRD4 inhibition is exquisitely effective against MPNSTs and may represent a paradigm shift in therapy for these patients," Le said.

However, while studies involving animals can be useful, they frequently fail to produce similar results in humans.

Malignant peripheral nerve sheath tumors usually evolve from a noncancerous but often large and disfiguring tumor called a "plexiform neurofibroma." Traditionally, the treatment was to remove the tumor surgically. However, the release noted, this can be difficult or impossible if the tumor is located near nerves.

Patients can also undergo chemotherapy and radiation, but the effectiveness of these treatments is limited. The five-year survival rate for these patients is about 50 percent, according to the news release.

Right now, the class of drug used in the experiments is being evaluated in phase 1 and phase 2 trials for treatment of leukemia and a type of lung cancer.

More information

The American Cancer Society has more about soft tissue cancer.

Tags: leukemia, genetics, skin cancer, lung cancer, research, cancer