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Researchers investigate treatment for tumor cells in spinal fluid

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In two to five percent of women with breast cancer, tumor cells migrate into the spinal fluid invading the tissue surrounding the brain and spinal cord called the meninges. While a rare complication, the condition is challenging because there is no agreed-upon standard of treatment, leaving little hope for patients affected. Northwestern Medicine® researchers are currently examining a novel approach to delivering an FDA approved drug that they hope will advance research for this type of cancer and lead to discoveries that may improve outcomes in the future.

As part of the clinical trial, the drug Trastuzumab is directly injected into the spinal fluid in hopes of stopping the growth of the cancer cells in patients with HER-2 positive breast cancer. Jeffrey Raizer, MD, co-director of the Northwestern Brain Tumor Institute (NBTI), is the principal investigator for trial which he developed. NBTI is part of the Robert H. Lurie Comprehensive Cancer Center of Northwestern University at Northwestern Memorial Hospital.

"When cancer spreads to the spinal fluid and tissues surrounding the brain, called leptomeningeal metastases (LM), there are very limited therapeutic options," said Raizer, who is also medical director of neuro-oncology at Northwestern Memorial and associate professor of neurology at Northwestern University Feinberg School of Medicine. "This rare condition typically occurs in later stages of cancer and often the benefits of treatment are small and may be counteracted by its side effects. For women with HER-2 positive breast cancer, they often have well-controlled disease in their body when this complication occurs."

Raizer explains that drugs cannot easily penetrate from the blood stream into the spinal fluid because of the blood brain barrier, making the condition difficult to treat. In this trial, the antibody will be delivered directly into the spinal fluid using a device that is placed under the scalp called an Ommaya reservoir. A small catheter is inserted into a fluid-filled space allowing fluid to be removed and for the drug to be instilled into it.

Women with HER-2 positive breast cancer that has spread to their spinal fluid are currently being enrolled in the clinical trial. HER-2 is a type of breast cancer that tests positive for a protein called human epidermal growth factor receptor 2 and leads to an excess of HER-2 protein. This type of breast cancer tends to be more aggressive compared to other breast cancers. Trastuzumab is currently approved for intravenous administration for treatment of HER-2 positive breast cancers and has been shown to be effective in slowing growth of these cancer cells while decreasing the risk of recurrence. Researchers hope similar findings will be true for its use in the treatment of LM.

"We want to offer patients the best chance of recovery possible," said Raizer. "By injecting the drug directly into the brain and spinal fluid, we hope to be able to offer a better means of treating the cancer in the spinal fluid."

The trial will enroll up to 30 women at five sites around the country. Participants must be 18 years old and have HER-2 positive breast cancer that has spread to the spinal fluid. Participants will be assigned to one of four groups receiving dosages of the drug to test its safety and effectiveness and then the safe dose level will be expanded.

"Research trials like this are an important means of finding better treatments for conditions that currently have very few options," added Raizer

Provided by Northwestern Memorial Hospital