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Novel immunotherapy vaccine decreases recurrence in HER2 positive breast cancer patients

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A new breast cancer vaccine candidate, (GP2), provides further evidence of the potential of immunotherapy in preventing disease recurrence. This is especially the case for high-risk patients when it is combined with a powerful immunotherapy drug. These findings are being presented by The University of Texas MD Anderson Cancer Center at the 2014 American Society of Clinical Oncology's Breast Cancer Symposium in San Francisco.

One of only a few vaccines of its kind in development, GP2 has been shown to be safe and effective for breast cancer patients, reducing recurrence rates by 57%. Further, women with the highest overexpression of HER2 (known as HER2 +3) had no cancer recurrences when they were administered the vaccine after completing trastuzumab (Herceptin), a type of immunotherapy drug known as a monoclonal antibody. HER2 is an oncoprotein that promotes tumor growth and is expressed to some extent in 75-80% of breast cancers.

"This is an important and different avenue in immunotherapy research, in that we are investigating ways to prevent cancer recurrence by stimulating the immune system to treat cancer," says principal investigator Elizabeth Mittendorf, M.D., Ph.D., associate professor of Surgical Oncology. "The ultimate goal is to develop a preventative tool that will minimize the risk of recurrence in women who have already had breast cancer and for whom standard therapies have failed."

The findings are the result of a phase II randomized trial that paired the GP2 vaccine, designed to stimulate the CD8+ cells, commonly known as "killer" or "toxic" T cells, with an immune stimulant known as granulocyte/macrophage colony stimulating factor (GM-CSF). The trial included 190 patients with varying levels of HER2; 89 women received the GP2 vaccine with a GM-CSF adjuvant and a control group of 91 patients received GM-CSF alone. Eight patients experienced early recurrence or developed a second malignancy and did not complete the vaccine trial. The vaccine is injected subcutaneously and the initial series consisted of monthly inoculations for six months, followed by four cycles of booster shots administered every six months thereafter. The patients were monitored for nearly three years.

For all 190 patients, including those who did not complete the trial, the disease-free survival (DFS) rate was 88% among those who received the vaccine and 81% in the control group – representing a 37% reduction in recurrence. Excluding the patients who did not complete the vaccine series, the results are higher – 94% DFS rate versus 85% who did not get GP2 – a 57% risk reduction.

Women with HER2 +3 who were administered trastuzumab as part of the standard of care prior to receiving the vaccine experienced no cases of cancer recurrence. According to Mittendorf, trastuzumab may act like a primer for the vaccine. Trastuzumab stimulates CD4+ T cells to release substances that fight cancer cells and initiates an antibody response. Thus, it may prepare the immune system, making the vaccine even more effective. MD Anderson is now testing this combination of immunotherapies in other clinical trials.

Personalized Immunotherapy

The GP2 study supports previous MD Anderson research on similar breast cancer vaccines, such as AE37, which showed a significant

immune response and improved recurrence rates in triple-negative breast cancer patients. Another candidate, E75, known as NeuVax or nelipepimut-S, showed a 50% recurrence decrease in high-risk patients. Currently, NeuVax is being tested internationally in a phase III clinical trial.

"We believe many more patients will benefit in some way from immunotherapy," says Mittendorf. "The challenge will be identifying the right immunotherapeutic approach for each individual patient. When doctors are able to do that, cancer therapy, and immunotherapy specifically, will follow a more personalized approach."

More information: breastcasym.org/

Provided by University of Texas M. D. Anderson Cancer Center