Bone drug could help prevent the spread of breast cancer

Maintaining bone density could be a key to decreasing the spread of cancer in women with locally advanced breast cancer, according to research at Washington University School of Medicine in St. Louis.

Bones are common sites for the spread, or metastasis, of breast cancer. Scientists here found that women treated for stage II/III breast cancer who also received a bone strengthening drug were less likely to have breast tumor cells growing in their bones after three months. The bone-strengthening drug used was zoledronic acid, a drug that decreases bone turnover and reduces bone fractures in patients with osteoporosis.

The findings will be reported June 3 at 11 a.m. CT at the 2008 American Society of Clinical Oncology Annual Meeting in Chicago.

"Tumor cells are continually being released from the primary tumor," says lead author Rebecca Aft, M.D., Ph.D., associate professor of surgery, faculty member of the Siteman Cancer Center and a Washington University breast surgeon at Barnes Jewish Hospital. "It is thought that the bone marrow harbors these cells and that these cells are likely to evolve into metastatic disease. We think that zoledronic acid changes the bone marrow so that cancer cells are unable to lodge there."

The researchers randomly assigned 120 women being treated for clinical stage II/III breast cancer to receive 4 milligrams of zoledronic acid intravenously every three weeks for one year, starting with their first cycle of chemotherapy, or to receive no zoledronic acid. Stage II/III cancer means the primary tumor has spread into lymph nodes or other areas near the breast.

At the time of diagnosis, none of the patients had evidence of metastatic disease on computed tomography (CT) and/or positron emission tomography (PET) scans. But bone marrow samples showed that about 40 percent of the patients had detectable breast tumor cells in the bone marrow.

Prior research has shown that women with even minuscule clusters of breast tumor cells — called micrometastases — in their bone marrow at the time of their diagnosis have an increased risk of developing large metastatic tumors later.

The researchers took bone marrow samples again three months and one year after treatment began. Only 23 percent of women who got zoledronic acid had tumor cells after three months compared to 36 percent of those who didn't get the drug. This result did not reach statistical significance.

Of women who started with no tumor cells in their bone marrow, 88 percent remained free of tumor cells in their bone marrow if they got zoledronic acid, compared to 70 percent of those who did not receive the drug. This result approached statistical significance. The one-year results are not yet available.

Aft says that women who receive chemotherapy for breast cancer have increased rates of bone turnover, which can release growth factors and produce a favorable environment for cancer cells. The suppression of bone turnover by zoledronic acid or other bisphosphonate drugs could make bones less friendly surroundings for cancer.

"We found that patients who are negative for tumor cells in bone marrow have a very good chance of staying negative if they take zoledronic acid," Aft says. "If longer follow up shows that women without

tumor cells in their bones do not go on to develop metastatic disease, then it would be reasonable to say that bisphosphonates will likely benefit women with locally advanced breast cancer."

Source: Washington University School of Medicine