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Anti-inflammatory drug may fight breast cancer

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The anti-inflammatory drug celecoxib may be a useful additional treatment for people with breast cancer, Dutch researchers report at the IMPAKT Breast Cancer Conference in Brussels.

The results of a randomized trial in 45 patients with primary invasive breast cancer showed that the drug --which is currently used to treat arthritis and other painful conditions-- clearly induced an anti-tumor response at the molecular level.

"This is exciting because it means that a medication already used to treat other diseases may be efficient in the adjuvant treatment of breast cancer as well," said lead researcher Juergen Veeck, from Maastricht University Medical Centre in The Netherlands.

Celecoxib is a member of a class of drugs known as selective COX-2 inhibitors. These drugs directly target COX-2, an enzyme responsible for inflammation and pain.

"We were pleased that the results from our clinical trial largely confirmed the existing data from several pre-clinical studies by showing that COX-2 inhibition leads to changes in cell proliferation, apoptosis, and extracellular matrix biology in primary breast cancer tissues," Dr Veeck said.

His group studied patients who were scheduled to have surgery to remove their cancer. Prior to surgery, patients were randomly assigned

to receive either 400 mg celecoxib twice daily for two to three weeks, or control treatment, which was either an inactive placebo or no treatment.

The researchers analyzed the expression of particular genes in samples from the tumors before and after treatment. Other tests were performed to determine changes in proliferation and apoptosis (programmed cell death).

After treatment 1,109 genes were significantly up-regulated and 556 genes were significantly down-regulated in celecoxib-treated breast cancer tissues when compared to control treatment, they found.

Genes involved in cell proliferation, cell cycle, apoptosis, extracellular matrix biology and inflammatory immune responses were particularly affected.

"Even short-term treatment with celecoxib sets up transcriptional programs supporting anti-tumor activity in primary breast cancer tissues," the researchers say.

The treatment period in this preliminary study was not long enough to see a significant change of tumor size or histological grade, Dr Veeck and colleagues note. "For now we can only speculate that a longer treatment with celecoxib would have resulted in measurable tumor shrinkage as well."

"Celecoxib and other 'coxib' drugs are generating some excitement as future breast cancer therapy since they are a well-established medication for other diseases, with relatively low toxicity and high safety profiles," Dr Veeck said.

"Until now, most clinical results suggested coxibs may be useful for cancer prevention. However, our study provides evidence that they may

also be efficient as cancer treatments, at least in breast cancer."

Because there are close links between COX-2 expression and Her2 status and aromatase levels in breast cancer, the Dutch group suggests that researchers should now investigate coxibs in combination with trastuzumab or aromatase inhibitors.

Commenting on the study, which he was not involved in, Dr Stephen Johnston, from the Royal Marsden NHS Foundation Trust and Institute of Cancer Research, noted that this small randomized clinical trial looked at changes in gene expression after short-term exposure to celecoxib, and anti-inflammatory drug that has been thought to have anti-cancer properties.

"The research used biopsies before and after 2 weeks of exposure to the drug or placebo to show the various genes that were altered by the drug, although these did not alter the way the cancer cells grew. Therefore, this can be a useful model in which to test exactly what a drug does in human breast cancer tissue in-vivo."

Provided by European Society for Medical Oncology

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