Beta-blockers help reduce metastasis and improve survival in breast cancer patients

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Treatment with beta-blockers can help reduce the spread of cancer in patients with breast tumours, a researcher will tell the seventh European Breast Cancer Conference (EBCC7) in Barcelona today (Friday). In a controlled study, Dr. Des Powe, a senior healthcare research scientist at Queen's Medical Centre, Nottingham University Hospital NHS Trust, Nottingham, UK, and his team found that the group of patients treated with beta-blockers showed a significant reduction in metastasis and better survival. The scientists believe that they are the first in the world to have investigated the effect of beta-blockers in breast cancer patients.

In collaboration with Professor Frank Entschladen's group at Witten University, Germany, Dr. Powe looked at three groups of breast cancer patients: those who were already being treated for hypertension by beta-blockers, those whose hypertension was treated by other medications, and those who did not suffer from hypertension and were therefore not taking any treatment for it. Forty-three of the 466 patients were already taking beta-blockers and, in this group, there were significant reductions in both distant metastasis and local recurrence. They also had a 71% reduced risk of dying from breast cancer compared with the other groups.

"We were also able to study the presence of one receptor for beta-blockers, β2AR, as a potential biomarker for predicting clinical response to beta-blocker treatment," says Dr. Powe, "but we did not find that this correlated directly to the outcome of treatment. We are currently looking at other target receptors as predictors of clinical outcome."

Previous cell line laboratory studies have shown that beta-blockers work against various types of cancer because high levels of stress hormones in the tumour increase cell proliferation and migration (the movement of cells to other locations). "These effects are induced by the stress hormones norepinephrine and epinephrine acting on specific target receptors in a kind of lock and key fashion," says Dr. Powe. "We sought to translate these laboratory findings into clinical research."

Beta-blocker drugs bind to a specific kind of receptor to prevent the stress hormones from reaching their target; in cancer cells this prevents the hormones from stimulating and activating them. The researchers say that they are sure that their results are due to the effect of beta-blockers rather than a protective effect of hypertension per se.

"If that had been the case, we would have seen similar survival benefits in patients receiving other forms of treatment for hypertension," says Dr. Powe, "but we did not. It is reasonable to speculate, therefore, that some non-hypertensive women with breast cancer will respond favourably to beta-blocker treatment, though doses and side effects would need to be investigated in clinical trials. We also need to look at whether beta-blockers could be given as a supplementary therapy with existing breast cancer treatment."

This finding may assist treatment in two ways, say the researchers: it appears to slow down tumour growth and could also be used to target those patients who have an increased risk of developing secondary cancers.

"Our first study is relatively small, and we now intend to validate it in a larger group," says Dr. Powe. "We will be looking for funding and collaborators to test the effectiveness of beta-blocker treatment on patients diagnosed with breast cancer. We are very encouraged by these first results which have already shown that by using a well-established,

safe, and cost-effective drug, we can take another step on the road to targeted therapy in breast cancer."

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