Immune-response genes affecting breast tumor eradication

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Breast cancer patients whose tumors express high levels of genes related to immune response are more likely to have their tumor completely eradicated by pre-operative chemotherapy compared to patients with low expression of these genes, Belgian researchers report at the 4th IMPAKT Breast Cancer Conference in Brussels, Belgium.

Their research has identified a group of patients who might be good candidates for treatments with new immune-targeting therapies.

Dr Michail Ignatiadis from Institut Jules Bordet, Brussels, and colleagues analyzed gene expression data from eight studies in which patients had been treated with anthracyclines, with or without taxane chemotherapy, prior to surgery.

"We undertook this pooled analysis[1] to explore whether patients with different breast cancer subtypes respond differently to commonly used pre-operative chemotherapy, based on differences related to the cells of the tumor itself or to the non-tumor cells surrounding the tumor," Dr Ignatiadis explains.

To that end, the researchers analyzed the expression of distinct groups of genes, which they refer to as gene modules, that had been shown by other investigators to be associated with either important oncogenic pathways responsible for tumor cell proliferation or with the way the host immune system reacts to the tumor.

Patients whose tumors expressed high levels of gene modules related to immune system functions were more likely to have their tumor eradicated by the chemotherapy, they found.

"Patients with breast tumors that have high expression of genes related to immune response are more likely to present complete eradication of their tumor after the administration of commonly used pre-operative chemotherapy compared to patients with low expression of these genes. This was mainly observed in the so-called HER2-positive and less so in the ER-negative/HER2-negative and ER-positive/HER2-negative subtypes," said Dr Ignatiadis.

"The role of agents that modulate immune response in breast cancer should be studied, and in these trials patients should be optimally stratified based on their immune response," the researcher added. "Moreover, future studies should investigate whether the efficacy of anti-HER2 agents in HER2-positive early breast cancer patients is also associated with tumor immune response."

Commenting on this study, which he was not involved in, Dr Angelo Di Leo from the Hospital of Prato, Italy, former IMPAKT Chair, noted: "This study highlights the importance of the immune response of the patient as a major factor that can substantially impact treatment efficacy. It is quite clear that response to a given anti-cancer treatment may vary from one patient to another based also on the ability of the patient's immune system to aggress the tumor. This and other recently published studies pave the way to the development of a new generation of cancer drugs that can stimulate the immune response of the patient and make it more efficient in aggressing the tumor."

More information: www.ncbi.nlm.nih.gov/pubmed/22508827

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