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Natural immunity in breast cancer patients during neoadjuvant chemotherapy and after surgery
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Abstract

Breast cancer is the most common cancer in women. Surgery, and more recently neoadjuvant chemotherapy, are being utilized as the initial treatment for breast cancer; however little is known about their effects on the natural immune system. The natural immune system (natural killer [NK] cells) is thought to be important in immune surveillance, including protection from metastasis during the intravascular tumour seeding that occurs during surgery.

To investigate the effects of surgery on the natural immune system, we studied the pre-operative and post-operative peripheral blood lymphocytes (PBL) of 10 patients with stage I or II breast cancer: there was a 71.6 ± 25.3% post-operative reduction in NK cell function ($P < 0.005$, Student's paired *t*-test). To investigate the effects of neoadjuvant chemotherapy and surgery, we examined PBL from five patients with stage III breast cancer: NK cell function dropped 95.7 ± 1.9% after neoadjuvant chemotherapy, and there was a further 51.0 ± 23.4% decrease after surgery ($P < 0.05$, Student's paired *t*-test). Neither group of patients had decreased numbers of NK cells, changes in the percentage of T helper or suppressor cells, or alterations in the production of cytotoxic factor by NK cells. These findings suggest that the impairment in NK cell function retlects a detect in the ability of NK cells to recognize and/or bind to tumour target cells.

We conclude that the initial treatment of breast cancer patients, whether it involves surgery alone or with neoadjuvant chemotherapy, profoundly impairs their natural immune system and could increase the risk of metastasis. Further studies are needed to delineate the mechanism of this derangement in natural immunity and possibly alter its course.

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