

Keratoses Immunotherapy for Breast Cancer: How Far Have We Come?

Breast cancer remains the most prevalent cancer in Indonesia and worldwide. It is one of the oldest documented diseases, as recorded in the ancient Egypt in The Edwin Smith Surgical Papyrus (3,000–2,500 B.C.). Centuries later, the modern era of breast cancer treatment began to take shape with William Halsted's introduction of radical mastectomy in the late nineteenth century. Systemic therapy such as Methotrexate and Fluorouracil were first used first in the 1950s to treat breast cancer.

Since then, our understanding of breast cancer has evolved dramatically. What was once regarded largely as a single disease defined by its anatomical origin is now recognized as a biologically and molecularly heterogeneous group of malignancies. This understanding has led to more precise therapeutic strategies, from endocrine therapy, HER2-targeted treatment, antibody-drug conjugates, to immunotherapy

Just like any other novel treatment, initially immunotherapy was studied for the treatment of metastatic, triple negative disease. After the evidence of benefit of immune checkpoint inhibitors (ICI) has been proven in the advanced disease settings, the use was expanded to adjuvant and neoadjuvant settings. Moreover, there are trials underway that explore the use of ICI in hormone receptor positive and/or HER2 positive diseases.

The landscape of immunotherapy encompasses a broad range of approaches, from ICIs combined with chemotherapy to emerging combinations with PARP inhibitors, anti-HER2 therapies, and antibody-drug conjugates. The evidence is growing and we are

waiting for the matured results of the study to be able to use them in daily practice. Other often-overlooked immunotherapeutic approaches for breast cancer include breast cancer vaccines and adoptive cell therapies. Neither has achieved the same degree of success like in other type of cancers. However, scientists are still working on developing these immunotherapies to treat breast cancer.

In conclusion, breast cancer is a very heterogeneous disease and humans have tried to develop many modalities to treat the debilitating disease. Current strategy with available evidence placed immunotherapy as one of the treatment regimens in advanced and early disease, especially triple negative breast cancer.

Noorwati Sutandyo

Department of Internal Medicine
Faculty of Medicine Universitas Indonesia

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