Immunotherapy: Ovarian cancer.

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Commentary

Immunotherapy has emerged as one of the most promising methods for the treatment of ovarian cancer. The Tumor Microenvironment (TME) is an important element to consider when generating antitumor responses since it is mostly composed of tumor-promoting immunosuppressive cell types that inhibit antitumor immunity. As we get a better knowledge of the factors that influence TME composition, we recognize the need of addressing both inter-and intra-tumor heterogeneity, mutation/neoantigen load, immunological landscape, and stromal cell contributions. The well-characterized mouse ID8 ovarian carcinoma model has been used in the bulk of immunotherapy research in ovarian cancer. There are several different animal models of ovarian cancer that have been neglected due to their limited initial characterizations in this context. We report animal models that, because of their similar genetic changes and histology with human ovarian cancer, may be untapped resources for immunotherapy research. We also discussed the models' strengths and limitations, as well as the knowledge gaps that must be filled in order to increase the value of preclinical models for assessing new immunotherapeutic approaches.

There are currently no authorized immunological treatments for individuals with Epithelial Ovarian Carcinoma (EOC). Because EOC is frequently discovered at a late stage, research has mostly focused on the development of novel therapies. Debulking surgery and adjuvant or neoadjuvant chemotherapy are now used as first-line treatments. Despite the fact that more than 80% of patients respond positively to this initial therapy, the majority of patients will recur with chemotherapy-resistant illness. Because the presence of Tumor Infiltrating Lymphocytes (TILs) corresponds with higher EOC patient survival, immunotherapies have the potential to improve EOC outcomes in the same way that they have for other kinds of cancer. The FDA has approved the use of several immune checkpoint inhibitors for Non-Small Cell Lung Cancer (NSCLC), melanoma, bladder cancer, renal cell carcinomas, and Hodgkin lymphoma, as well as the first Chimeric Antigen Receptor (CAR)-T-cell therapy for children with B-cell acute lymphoblastic leukemia.

According to the research, immunosuppressive cells in the Tumor Microenvironment (TME) significantly reduce antitumor immunity in EOC patients. The tumor niche contains a variety of cell types, including immune cells effector T and B lymphocytes, regulatory T and B cells, Natural Killer Cells (NKs), Tumor-Associated Macrophages (TAMs), and Myeloid Derived Suppressor Cells (MDSCs), among many others and other TME components, such as fibroblasts and adipocytes in the omentum. MDSCs, TAMs, and regulatory T cells (Tregs) play an important role in maintaining a highly immunosuppressive TME by producing immunomodulatory molecules (Transforming Growth Factor-Beta (TGF), interleukin (IL)-10, IL-6, and so on) and inducing and recruiting immunoinhibitory cells, which dampens antitumoral immunity and promotes tumor progression. As a result, EOC immunotherapy must include methods aimed at both reducing the extremely immunosuppressive TME and stimulating immune-activating antitumoral responses. This review presents promising preclinical and clinical trial outcomes and emphasizes immunotherapies that provide novel and combinatorial methods to circumventing antitumoral obstacles inside the TME.

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