

Note on Immunotherapy of Lung Cancer

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DESCRIPTION

Immunotherapy for cancer, sometimes called Immuno-Oncology, is a type of medicine that treats cancer using the body's own immune system. The immune system protects you from harmful foreign agents such as bacteria and viruses. When it works well, it attacks things that should not be in the body. There are also measures to prevent the immune system from attacking what should be like normal organs in the body. Cancer is a tricky problem for the immune system because the cancer cells were just normal organ cells, so they have some familiar features. But when the cells turn into cancer, they acquire some new symptoms, which are ideally recognized as foreign and labeled for immune destruction. Immunotherapy drugs for lung cancer can help the body identify cancer as foreign and malignant so that the body can fight it. There are the following types of immunotherapy for lung cancer.

Immune checkpoint inhibitors

The most advanced immunotherapy for lung cancer has been in immune checkpoint inhibitors. Immune checkpoints are molecules on immune cells that can initiate or inhibit the immune response. The immune system uses these molecules, which are normal and which should be attacked. Cancer cells sometimes deceive the immune system by exhibiting these checkpoints, preventing the body from attacking them.

There are several medications that target approved immune checkpoints for the treatment of lung cancer. Most of these drugs block or "inhibit" the association between the PD-L1 protein and the PD-1 receptor on the T-cell. PD-L1/PD-1 interaction acts as a breakthrough that prevents the immune system from responding to cancer. By blocking this interaction, the immune system can detect and attack cancer cells. One of these approved drugs is targeted at other immune checkpoints called CTLA4. When CTLA4 is inhibited, the body can increase the number of immune cells available to respond against cancer cells.

Checkpoint inhibitors are given as an intravenous (IV) infusion. These medications have similar side effects to chemotherapy such as fatigue, nausea, itching, skin rashes and more, but they

are generally less toxic than chemotherapy. However, since drugs work by stimulating the immune system, it is possible to develop serious immune-related side effects from a highly-stimulated immune system that affects the functioning of the organs.

Cancer vaccines

When most people think about vaccines they think about treatments to prevent the disease. However, there is another type of vaccine called the therapeutic vaccine. This type of vaccine treats existing cancer by improving the immune system in killing the cancer cells. These vaccines target proteins present in cancer cells, not in normal cells or only in normal cells.

Sometimes, vaccines are customized to target proteins specific to a person's cancer. In other cases, vaccines target cancer-specific proteins that most people share. Before being vaccinated, it is necessary to first take medication to reduce the type of immune cells that allow the cancer to grow and increase the number of immune cells that respond to the cancer. Currently, these vaccines are being studied in clinical trials. There is currently no FDA-approved vaccine for the treatment of lung cancer.

Adoptive T-cell therapy

In this treatment, T-cells (a type of white blood cell in the immune system) are removed from the body and then transplanted into a laboratory so that they are better at attacking the specific cancer cells. Finally, the enhanced T-cells are put back into the body to help fight cancer. T-cells can be removed from the body by a process called plasmapheresis, which helps to filter the blood to identify specific types of blood cells. It can also be done by removing some part of the tumor and separating the T-cells from the tissue. Currently, this type of treatment is being studied in clinical trials and no such treatment has been approved by the FDA to treat lung cancer.

Immunotherapy works differently than other lung cancer treatments such as conventional chemotherapy, targeted therapy and radiation. Conventional chemotherapy uses chemicals to kill or destroy cancer cells. These drugs also affect healthy cells. It can cause side effects such as nausea, fatigue and hair loss, decreased white blood cell count and infection. Targeted therapy

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focuses on mutations that are in some lung cancer tumors. These treatments attack the tumor cells or specific targets that cause the tumor to grow uncontrollably. Radiation therapy uses powerful, high-energy X-rays or cells to kill cancer cells or prevent tumors from growing. Immunotherapy does not resolve mutations in tumors. Instead, it targets communication between the immune system and the tumor, which helps the immune system fight cancer.

New strategies for the treatment of lung cancer, inducing sustainable responses to treatment, are currently being

developed. The inclusion of immunotherapy in the arsenal of drugs for the treatment of lung cancer is a promising approach to achieve these goals, with lower rates of side effects. Personalized medicine currently offers the best profile in terms of side effects and efficacy in various cancers and improves its functionality in combination with Immunoassay checkpoint blockers. Given the promising results reported, the challenge now is to find biomarkers that will help us choose the best treatment for the patient.