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Editorial

Combination of Viral Therapy and T-cell Therapy in Treatment of Cancer

Katherine Joseph*

Department of Oncology, University of Montreal, Montrela, Quebec, Canada

DESCRIPTION

The prognosis of patients with solid tumors has remained severe in the past few decades even though the cure rate for cancers has increased significantly in the past few years. There is a lot of research taking place in order to treat and cure cancer. One of the research include Oncolytic vaccinia virus (VV) which is cancer destroying. It can infect, replicate and lyse tumor cell and can spread to other tumor cells in successive rounds of replication, therefore considered as an advanced supplement in cancer therapy. The clinical studies have proven their safety but not the efficacy of oncolytic vaccinia virus.

The mechanism of action includes the destruction of the tumor cells which activates T cells, which are the components of immune system. These T cells can spread to remote sites and targets if any other tumors found.

T cells are a type of white blood cells which play an important role in cell-mediated immunity. By binding to target molecules related to MHC class I molecules expressed on the surface of tumor cells, T cells express membrane receptors on their surface and recognize their targets. Reminded by this tumor target molecule, T cells are activated and then produce cytokines and killer molecules, such as perforin, granzyme A, granzyme B which are responsible for lysis of tumor cells.

Adoptive T cell therapy is where the T cells have been produced *in vitro* and then re-injected into cancer patients. T cells can prolong the survival of the cancer patients in the early and late stages of the disease by controlling the tumor growth.

A new T cell called TEA-VV expresses secreted bispecific antibodies that bind to CD3 and the tumor cell surface antigen EphA2 (EphA2-TEA-VV) in order to activate the T-cells.

Drug-armed VV is less stable therapy when compared to T cell adapter-armed VV Therapy. In order to induce or enhance tumor-specific adaptive immunity, oncolytic VV has been genetically equipped with antibodies, cytokines and chemokines. It is difficult to induce tumor-specific immune responses in view of the numerous immune escape mechanisms of tumor cells selected by cancer patients during the immunoediting process. By directly binding endogenous T cells and tumor cells in a tumor antigen-specific manner leading to tumor lysis, TEA-VV exerts its effective role. Secretion of T-cell participants induce the secretion of pro-inflammatory cytokines which causes reversing of the immunosuppressive environment present in most of the solid tumors.

Cancer cannot be cured when it is diagnosed in the advanced stage which requires the development of new anti-tumor therapies. The oncolytic viruses which are genetically modified have been extensively used in clinical research which represents a potentially exciting new treatment pattern for human cancer. The main limitations of current oncolytic viruses can be overcomed by the T cell adaptor armed oncolytic virus with the unique ability to guide a large number of endogenous T cells to tumor cells not infected by the oncolytic virus. To improve oncolytic viral therapies by using T cells for cancer treatment, oncolytic viruses armed with T cell adapters are considered as an effective and unique strategy.

Correspondence to: Katherine Joesph, Department of Oncology, University of Montreal, Montrela, Quebec, Canada, E-mail: katie.joesph@umontreal.ca

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