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Introduction

Hepatocellular carcinoma is the fifth most commonly occurring cancer and the third cause of death cancer. Immunotherapy has been proven effective and safe in treating solid tumors. For hepatocellular carcinoma, there are immunotherapeutic strategies, such as adoptive cell therapy, chimeric antigen receptor-modified immune cells, engineered cytokines, and therapeutic cancer vaccines, represent hope to HCC patients.

Objectives

The purpose of this work is to review immunotherapy methods in Hepatocellular carcinoma.

Material and Methods

A wide PubMed search was performed using the keywords: Immunotherapy and hepatocellular cancer. 1058 articles were found. A systematic review during the last year was made.

Results

Rates of immunotherapy results in HCC result unsatisfactory. Nevertheless, it has been demonstrated that the CTLA-4 inhibitor combined with the PD-1/PD-L1 inhibitor can result in a nonredundant effect. CTLA-4 can inhibit the proliferation of T cells in lymph nodes at the initial stage of the immune response, while PD-1 suppresses activated T cells at the later stages of this response. Also, it has been proved that the combination of anti PD-1 drugs and anti-VEGFR-2 drugs promotes vascular normalization and enhances antitumor immune responses in HCC. Another novel way to treat HCC is through Oncolytic viruses (OV), they can replicate in the tumoral cells and can infect these ones throughout the tumor bulk, examples of these viruses can be the herpes simplex virus type 1-based oncolytic vector, and Cytokine-armed vaccinia virus. Emerging technologies like single-cell RNA sequencing may help to determine biomarkers of the predictive therapeutic response to immunotherapy. Immunotoxins can also help in immunotherapy against HCC. There are many factors affecting immunotoxins efficiency, including the type, localization, and rate of expression of targets. Normal cells can express the target antigens in a low concentration and get affected by immunotoxins. Antigen-binding affinity, epitope location, amino acid types on the antibody paratopes, and the rate of target antigens on the cell surface are many other factors that can affect the immunotoxin efficiency.

Conclusions

One reason immunotherapy is important for Hepatocellular carcinoma, it's because there are many immune cells in that organ. Because HCC is very aggressive, immunotherapy must be applied correctly. There are a lot of immunotherapies for all cancers, nevertheless, some has been tested for specific organs or tissues, and probably in the future, this organ-specific treatments can be applied in other tumor tissues.

