Abstract

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Individualized multimodal immunotherapy for cancer: more than CAR T cells and checkpoint inhibitors?

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Abstract

Anticancer therapy consists of the combination of several anticancer treatment modalities like surgery, radiotherapy and chemotherapy. Primary goal is to eliminate cancer cells, with the assumption that the patients survive the combination therapy. Innovative targeted therapies and CAR T cells have a narrower spectrum against cancer cells, and are a fourth pillar of anticancer therapy. The cancer immune surveillance is recognized for many years, and inspired research to strengthen the immune system within the patient. We developed a combined approach of immunogenic cell death (ICD) therapy with oncolytic viruses and modulated electrohyperthermia, being the fifth pillar of anticancer therapy (biologic and physics treatments). The goal of ICD therapy is killing cancer cells via a mechanism that is distinct from the other anticancer treatment modalities. Besides, however, ICD therapy induces an anticancer immune response. Insights are gained that also radiotherapy and some chemotherapeutics can induce ICD, besides their anticancer mode of action. In most patients, this immune response is not enough to install an anticancer immune protection, although it might happen in rare patients. Active specific immunotherapy with cancer vaccines are needed in connection to the anticancer/ICD therapy. We enter a domain of highly individualized treatment strategies. Finally, modulatory immunotherapies like checkpoint inhibitors, metronomic cyclophosphamide, metronomic capecitabine, risedronate, total body hyperthermia should be implemented, again individualized depending on the tumor-host interaction of each patient. Because the tumor and the functional immune system are extremely dynamic processes, maintenance ICD therapy is installed to kill newly developing tumor subclones and let include their antigenicity within the global immune protection. Retrospective clinical outcome data suggest synergistic activities for prolongation of overall survival of patients with glioblastoma multiforme when individualized multimodal immunotherapy is integrated into the standard of care combination therapy.

Biography

Stefaan W Van Gool, MD, PhD is medical director at the Immune Oncologic Centre Köln (www.iozk.de), and Qualified Person in the connected GMP laboratories. The IOZK is a translational immune-oncology ambulant clinic, founded by Wilfried Stuecker, where patients are treated with multimodal immunotherapy including an approved anticancer vaccine IO-Vac®. The clinical focus is mainly Glioblastoma multiforme and DIPG, digestive oncology, breast cancer, prostate cancer, ovarian cancer and cervical cancer. The translational academic input is derived from Prof Schirrmacher, emeritus from the university of Heidelberg and expert in oncolytic virus research, and Stefaan Van Gool, former professor at the University of Leuven and initiator of dendritic cell vaccines in the domain of neuro-oncology in Europe.