DENDRITIC CELL-BASED ANTICANCER VACCINATION IN IMMUNOTHERAPY OF METASTATIC RENAL CELL CARCINOMA

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ABSTRACT – Dendritic cell-based anticancer vaccination is a newly studied and developed approach in cancer immunotherapy based on the stimulation of immune system and supporting natural resistance to cancer via tumor-specific antigens. Cancer immunotherapy is less damaging to the rest of the body in contrast to chemo- or radio-therapy, therefore cancer therapeutic vaccines are not associated with any serious side effects. Dendritic-cell based anticancer vaccinations are used these days as a supporting treatment (in clinical trials) after surgical tumor removal. Their crucial effects seem to be in the prevention of relapse and extended remission period or patients' survival via generation of specific immune response able to clear and/or suppress any residual cancer cells.

INTRODUCTION

Renal cell carcinoma (RCC) represents 2–3 % of all adult cancers with usually good prognosis of early stage. However, prognosis for patients with advanced metastatic stage of RCC (mRCC) is poor, 5-year survival rate dramatically decreases from approximately 90 % (T1 tumor) to 30 % (mRCC) (Lam *et al.*, 2005; Hollingsworth *et al.*, 2007). Moreover, distant metastasis or local recurrence is diagnosed in around 40 % of patients treated for localized RCC (Janzen *et al.*, 2003; La *et al.*, 2005). Furthermore, metastatic stage is demonstrated in around 20–30 % cases of newly diagnosed patients. RCC does not generally respond to chemotherapy or radiotherapy, however, RCC is one of the most immune responsive cancers in human, thus more immunotherapy approaches have been developed and are applied in patients´ treatment with positive results consisting of higher objective response rate and higher survival rate (treatment via interleukin (IL)-2, interferon (IFN)-α, multitargeted tyrosine-kinase inhibitors) (Berntsen *et al.*, 2006; Ayllon, 2011). One of the supported medical immunotherapy treatment of mRCC can be anticancer vaccination based on *ex vivo* preparation of differentiated dendritic cells (DCs) presenting tumor antigen leading to starting patients' immune response via activated T-cells. During the last 15 years, more phase I and II clinical trials have been involved in mRCC immunotherapy. The data obtained from clinical research have been published in original articles and summarized in few reviews discussing the effectiveness, treatment progress and