ABSTRACT

Expert Rev Vaccines. 2022 Jan 25. doi: 10.1080/14760584.2022.2027759. Online ahead of print.

A comprehensive update to DC therapy for glioma; a systematic review and meta-analysis.

Shamshiripour P(1)(2), Nikoobakht M(3), Mansourinejad Z(4), Ahmadvand D(2), Akbarpour M(5)(6).

Author information:
(1)Faculty of Medicine, Iran University of Medical Sciences, Tehran, Iran.
(2)Department of medical imaging technology and molecular imaging, Iran University of Medical Sciences, Tehran, Iran.
(3)Department of Neurosurgery, Iran University of Medical Sciences, Tehran, Iran.
(4)Department of systems biology, National Institute of Genetic Engineering and Biotechnology (NIGEB), Tehran, Iran.
(5)Advanced Cellular Therapeutics Facility, David and Etta Jonas Center for Cellular Therapy, Hematopoietic Cellular Therapy Program, The University of Chicago Medical Center, Chicago 60637 IL, USA.
(6)Immunology Board for Transplantation and Cell-Based Therapeutics (Immuno-TACT), Universal Science and Education Research Network (USERN), Chicago, USA.

BACKGROUND: Gliomas are a major challenge of neuro-oncology due to high mortality and recurrence rates. Clinical applications of Dendritic Cells; as well-known immunotherapeutics has yielded promising results in the clinical trial pipelines over decades.

RESEARCH DESIGN: In this systematic review, we critically discuss the current status, future perspective and challenges of dendritic cell therapy for gliomas in clinics and summarize the adjuvants and antigens used for dendritic cell therapy based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. We used the Cochrane Collaboration's tool to assess the bias risk in each trial. Furthermore, we summarize the study population and setting, study blinding, comparators, dosage, treatment regimens and durations, efficacy and safety issues of the clinical trials published on DC therapy for gliomas and also report the results of our meta-analysis on safety, and clinical/immunological efficacy of dendritic cell therapy for gliomas in the past decades.

RESULTS: in the current review, 39 previous studies were considered eligible for meta-analysis, enrolling 1049 patients who received autologous dendritic cells and 558 as controls/historical controls. The results of our meta-analysis indicated that the most frequent grade I/II adverse event reported in phase I or phase I/II trials was fatigue (~16% and 24%). Moreover, in phase II trials, fatigue and cytopenia were the most common adverse events (AEs) (~9% and 14%). Meanwhile, Grade III/IV AEs were rare comprising peritumoral edema and neurotoxicity; seizures and hematotoxicity. Moreover, our meta-analysis yielded promising results for infiltration of CD8+T cells into tumor site ~64% after DC therapy and IFNγ increase in ~45% of the patients as an immunological response suggesting promising immunological efficacy for DC therapy for glioma.

CONCLUSIONS: DC therapy could serve as a safe and potent immunotherapy strategy for gliomas however, still limitations exist to draw certain conclusions on the potential efficacy due to the diversity of the criteria applied to assess the clinical response (e.g., RANO, RECIST, Macdonald criteria, and iRANO) and limited data on patients' survival.

DOI: 10.1080/14760584.2022.2027759

PMID: 35076331